THE NEW YORK HERALD New York & Tribune O MAGAZINE

SUNDAY, SEPTEMBER 13, 1925

The Brownlees Get Into a Radio Mix-Up

Husband and Wife and Two Friends Disagree on What They Want to Hear, but Finally Admit Their Preference

By ELLIS PARKER BUTLER



Edward Brownlee, let go of this dial!" exclaimed Mrs. Brownlee, tugging at it.

"that my wife allowed herself to-ah-to

"That is exactly what I mean," said

Brownlee frankly. "And I say so because

home. Night after night my wife and I

sit before our loud speaker, often holding

lovers, and listen to the soothing strains

business cares and my wife has come

home a little cross from some quarrel at

her club, the music soothes and delights

us, and we are more loving and amiable

than ever before. I do hate to think that

you have given up radio, Murchison! I

wish you could see how it warms and

softens the hearts of my dear Sophia and

myself-how we sit there evening after

become irritated?"

NE EVENING when Mr. Murchison had seated himself in the smoking car, en route from New York to his home in Westcote, his radioenthusiastic neighbor, Brownlee, came and

"Hello, Murchison," Mr. Brownlee said. "How is your radio working these days?" "Brownlee," said Murchison, frowning, "I wish you would not talk about radio to me. It annoys me, Brownlee. But if you must know, Brownlee, my radio is not working at all these days. You know very well, Brownlee, that the last time you were in my house you tried some silly stunt and wired Mrs. Bimberry's ankle to the radiator, and my wife has not spoken to

Brownlee, radio has caused enough trouble in my family." Mr. Brownlee, who remembered the night of Mr. Murchison's radio party quite well, blushed, but he was a genuinely enthusiastic radio lover and after a mo-

me since. I have not been near my radio,

Brownlee, since that night. In my opinion,

ment he said: "If you will pardon me for saying so, Murchison, that trouble was not the fault of the radio. Radio never causes trouble. Radio brings peace and happiness into the

"You mean," said Mr. Murchison,

He stopped short and slapped Mr. | Mrs. Murchison coldly, and Mr. Murchison

A Glove Bout on the Air

nothing of that sort ever happens in my "Say!" he exclaimed enthusiastically, "you've got to come over this evening! It is going to be a great evening! Do hands as we did when we were young you know what WPX is broadcasting tonight? Why, man, WPX is broadcasting of sweet music as they come to us through the Benk-Coogan prizefight right from the air. Even if I have been irritated by the ringside!"

"You don't say!" exclaimed Mr. Murchison. "By George, that ought to be great! What time"-

The result of this conversation was that shortly after dinner Mr. Murchison coughed gently and told his wife he believed he would run over to Brownlee's

for an hour or so if she did not mind. "I would far rather you went there than that you brought him here," said

This Is Radio Week in New York City

This issue of the New York Herald Tribune Radio Magazine contains two full-page feature articles describing New York City's two radio shows and also much other valuable information relative to the two expositions, including pictures of some of the new apparatuson display this week.

put on his coat and hat and went over to Brownlee's. When the maid ushered him into the library, where Brownlee's radio was installed, no one was there.

"Mr. Brownlee said, sir," the maid told him, "that I should tell you he had just gone out for some cigars, but he will be back soon. Mrs. Brownlee is not home; she went out auto-riding with Mrs. Biraberry and stopped there for dinner."

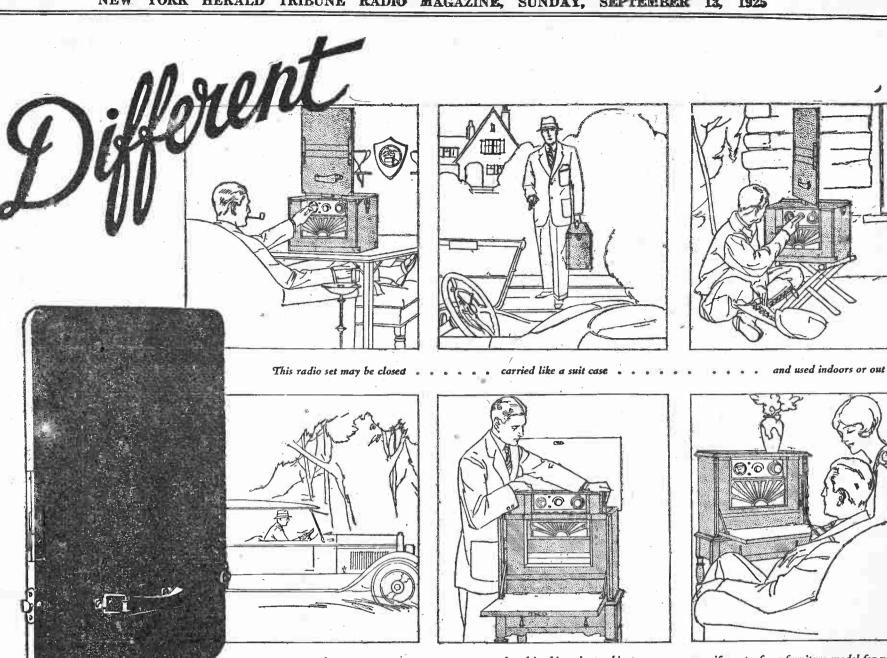
Brownlee returned almost immediately. He handed Mr. Murchison one of the rigars and told him to light-up, and lit a cigar himself.

"I'm sorry my wife is not home, Murchison," he said. "This prizefight is going to be great, but what I really wanted was for you to see how two reasonable people can get pleasure out of the radio, even if they are man and wife. Hello! Look at the time; the fight ought to be beginning."

Mr. Murchison dropped into a chair and Brownlee, with the deft fingers of an expert, manipulated the dials. When he had keyed in at 360 meters the voice of WPX's announcer came from the loud speaker with admirable distinctness:

"This is WPX, broadcasting the Benk-

(Continued on page twenty-five)



The Operadio Idea Makes Radio Completely Enjoyable

Only with the Operadio is the very finest quality radio reception possible whenever and wherever you want it.

Offering everything that any set can bring, and much that no other can duplicate, it is your logical choice of radio for your home,

The Operadio is entirely self-contained. It requires no outside wires, no separate loudspeaker, no bothersome wet batteries. For the past two years it has been the talk of the entire world. Today you will find it in thousands and thousands of American

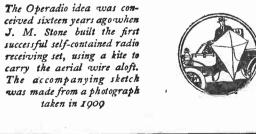
Close it up, carry it to any part of house, or take it with you anywhere. Open it, and in a moment you can be listening in on stations hundreds and even thousands of miles distant. Perfect fidelity of tone-clear, distinct, undistorted! Amazingly simple tuning to bring in one station after another.

For those who desire it, a beautiful dark walnut cabinet is available for housing the set in the home-combining the attractiveness of a furniture model with the convenience of absolute portability.

Do not make the mistake of buying a radio set until you have seen and heard the Operadio. Ask your dealer to demonstrate it in your home in comparison with any other high-grade set.

THE OPERADIO CORPORATION Chicago, Illinois 8 So. Dearborn St.

The Original Self-Contained Radio



The Operadio shown above is a complete self-contained set with six tubes, loudspeaker, loop aerial, batteries and all parts fitted into a compact carrying case. Ready for use anywhere at a moment's notice. It may, if desired, be housed in the beautiful

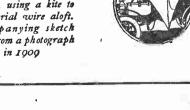
Tudor Cabinet. And for those who want a compact set for

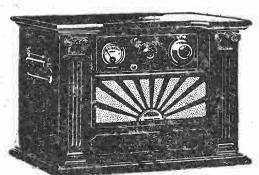
Prices without tubes or batteries,

Portable \$160; Consolette \$180; Tudor Cabinet (for housing the

semi-portable mahogany case.

yortable) \$68.





The Beautiful New Consolette Makes its First Appearance at the Radio World's Fair Operadio Convenience in a Cabinet of Classic Beauty

Those who want Operadio advantages in a compact set for home and apartment

use only, will welcome the beautiful new The exquisite mahogany case—like all

Operadios—contains the complete instru-

ment. It may be readily carried to any

room of the house—and is instantly available for use as no outside wires or connections of any sort are used.

The special loop supplied with the Consolette may be used either concealed within the cabinet or exposed, plugged into the eyelet in the top when extremely directional effects are desired.

DON'T FAIL TO VISIT THE OPERADIO DISPLAY AT THE RADIO WORLD'S FAIR

This is the first of a series of twenty-five similar advertisements that will appear this Fall in leading New York newspapers

home.'

starting point, almost ideal synchro-

controls the fountain pen. A dark

to jab down and make a dot on the re-

with regard to distance from the end and degree of rotation. Point by

point, merging finally into line by line, the received picture unfolds. In twenty minutes' time it has been

completed. No developing is re-

quired, the picture inks itself into view as it is received, and by prcjecting the cylinder on to a screen

an entire audience can watch it i

The photo-radio process is an in-

vention of Captain R. H. Ranger, one

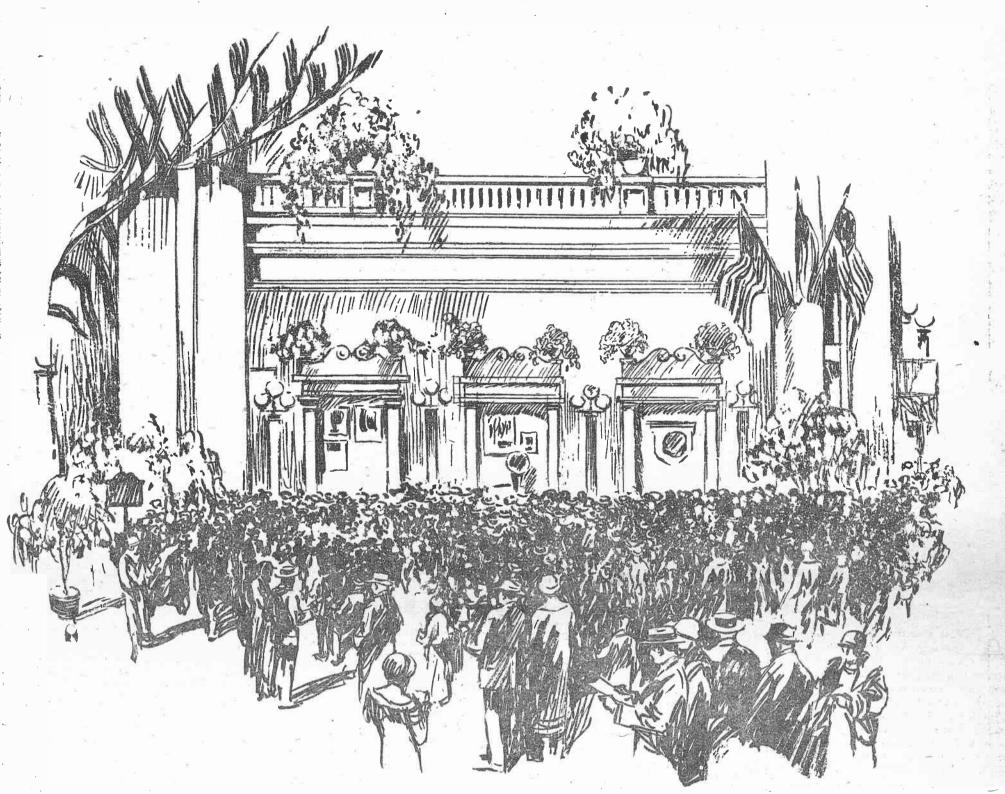
process of being born.

Photo radio transmitting apparatus

Fourth Annual National Radio Exposition Opened Yesterday Afternoon

Three Floors of Grand Central Palace Are Utilized for 400 Exhibits of 200 Manu facturers

BY ISROY NORR



Throngs are expected to attend the Fourth Annual National Radio Exposition at the Grand Central Palace

HE Fourth Annual Radio Exposi-Grand Central Palace with an address delivered by Secretary Herbert C. Hoover, who represents the interests of

The exposition at Grand Central Palace dwarfs previous efforts made by the company. Over 400 separate exhibits of sets. loudspeakers, vacuum tubes, batteries, battery chargers and other accessories are being shown. Nearly 200 of the world's largest radio manufacturers are exhibiting the best products of their laboratories. It is expected that orders to the extent of over \$150,000,000 will be placed during the period of the exposition, which will run from September 12 to 19, inclusive.

To celebrate the era of international broadcasting which will begin this fall the Duke of Sutherland, president of the British Radio Association, representing the radio public of England, will broadcast greetings to the radio public of America by radio from London on the opening day. As with Secretary Hoover's address, which was delivered at Washington, broadcast to the exposition and amplified by a huge electric loud sneaker to every corner of the vast auditorium, the Duke of Sutherland's message was to be repeated by the most powerful stations in England, received at Grand Central Palace and reproduced to the thousands of people who will come to witness the demonstration on Saturday. Both Secretary Hoover's address and the Duke of Sutherland's greeting also reached a vast audience outside of Grand Central Palace, for both features were

tion was ushered in on Saturday at | the Radio Corporation of America.

To Demonstrate Television

A striking feature of the exposition is and sound will be transmitted by radio to demonstrate the future of the art in television. Simultaneously with a message broadcast from a distant point to the vast audience in Grand Central Palace, the transmission will begin of a photograph of the speaker by radio, which will form and take shape on a huge screen to be erected in Grand Central Palace. It is expected that the experiment will consume no more than sixteen minutes.

The extent to which radio has annihilated both space and time will be graphically demonstrated at the exposition by a world radio roll call to be flashed from a transmitting station there on Tuesday night. To a world call sent out in Esperanto acknowledgments will be invited from every wireless station in England France, Germany, Italy, Poland, Norway, Sweden, Japan and the Argentine. Leading engineers have estimated that the whole world may thus be rounded up by wireless within less than one minute, but an even more phenomenal record will be attempted at the exposition.

Women to Participate

In recognition of what radio has done for the home, the American Woman's Association, under the leadership of Miss Gertrude Robinson Smith and Anne Morgan, will participate in the exposition through a special entertainment and edubroadcast by the stations of the American | cational program staged by the associa- | in radio development that has received

day, September 17. Marie Dressler, the [during the last twelve months is termed in inimitable comedienne; Miss Vaughn de | engineering circles, acoustic synchroniza-Leath, the original "Radio Girl," and a tion. The inflections of the human voice, number of other stars will be included in | it is explained, and the vibrations of the millions of radio fans in the United to be staged on Monday, when both sight the program. A message will be broad- musical scale, occupy an acoustical frecast by Miss Anne Morgan and an address | quency of from 16 to 10,000 vibrations per to the women of America will be delivered at the exposition by Miss Gertrude Robinson Smith.

> The extraordinary efforts made by the industry this year to establish radio as a thing of beauty in the home, as well as a service, will draw thousands of women to the exposition next week. To provide a feature of particular interest to feminine hearts, a fashion pageant will take place at the radio show daily, every afternoon and evening. Beautiful mannequins, artists' models and motion picture stars will display the fashions of 1926 from 2:30 to 3:30 in the afternoon and from 8:30 to 9:30 in the evening. A stage twenty by sixty feet, will be constructed on the third floor of the Grand Central Palace, in the form of a huge receiving set. The models will emerge upon the stage from a loud speaker six feet in diameter In addition, prominent fashion experts will broadcast to the radio audience outside minute descriptions of women's fashions for 1926 as displayed for the first time at the Fourth Annual National Radio Exposition next week.

A vast panorama of radio progress will be spread before the eyes of the thousands of radio enthusiasts who will visit the exposition. Refinements in radio apparatus undreamed of by the public will be shown for the first time. The principle

, Telegraph and Telephone Company and | tion in Grand Central Palace on Thurs- | major attention from radio engineers second. The task of co-ordinating, or synchronizing, the acoustical elements at the transmitting and receiving ends of the radio circuit has been accomplished this year to a remarkable degree.

New Apparatus

The result of these developments is that leading radio manufacturers of the United States will exhibit at the exposition this year loud speaker units in some cases almost as elaborate as the sets themselves. One of the new loud speakers to be shown at the exposition includes transformers. filters, chokes, rectifier tubes and amplifier tubes. When used in connection with a certain type of set, it may be employed also to energize the grid, plate and filament circuits, thus constituting a complete AC operated set.

So amazing have been the results attained in acoustical synchronization that for the first time the feat will have been achieved this year of reproducing in the home an orchestra or a concert with the original volume, and yet without the least distortion. Because of the extraordinary volume thus obtainable some of the loud speakers will be furnished with long cords, of as much as fifty feet, so that the loud speaker may be placed at this distance from the receiver.

A new super-power amplifier tube, de-

Continued on page eight)

Visitors at Radio Show to See New Photo-Radio Apparatus receiver to the same succeeding starting point, almost ideal synchro-

The Equipment Used by the Radio Corporation for Sending Pictures by Wireless Will Be Explained to the Public

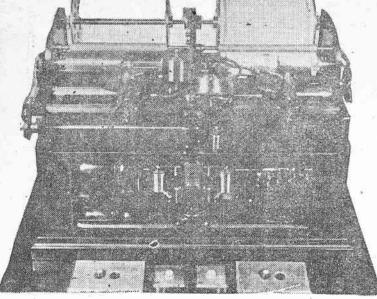
HOTO-RADIO" is a new term in our radio vocabulary, and but few have heard two trains were moving at exactly focused by special lenses on a point is a point on its axis, rotates again, and so on. An intense light is focused by special lenses on a point is axis, rotates again, and so on. An intense light is focused by special lenses on a point is axis, rotates again, and so on. An intense light is focused by special lenses on a point is axis, rotates again, and so on. An intense light is focused by special lenses on a point is axis, rotates again, and so on. it used as yet. Still fewer have seen exactly opposite the newspaper to may pass through is reflected after many, however, to know that the justcompleted apparatus of the Radio Corporation of America will be shown in actual operation at the National Radio Exposition at Grand Central Palace this week.

First, let us define the term "Photo-radio" means the sending of photographs or other pictures by means of a radio transmitter to a distance and receiving these wherever suitable apparatus may be located. Thus, like broadcasting, a million people could receive the same picture at the same time, provided only, again as in broadcasting, that they possessed suitable apparatus for

Now, photo-radio is not by any means "tele-vision." By the latter we mean the equivalent of "radio motion pictures," or, more exactly, the ability to see, by radio, some distant event just as it would appear to the eye of some one near it at the moment. Photo-radio is the first step

person's face, or printed page, or at every instant.

special device and by means de- was blindfolded and had to control the endless analysis by the little In arranging the programs as much scribed in detail in later paragraphs | the speed of the engine by radio mes- | boring electric light of the lightness | detail and preparation is required the lights and shades of this picture sages from the other train, telling or darkness of the negative on which as for the entertainment that we are sent, square inch by square inch, him whether to slow up or increase it shines. in the form of high-speed dots sent speed. It would be almost beyond At the receiver is a similar cylinder we try to keep our finger on the out by a radio transmitter. At the the skill of man for the two trains of paper. A fountain pen, connected pulse of the public taste and modify receiver, or as many receivers as may to maintain exact identity of speed by small rubber tubing to an ink and alter our programs accordingly. be in operation, the received dots for any length of time under such reservoir, presses on the paper. In-



by different degrees of light passing through a negative or other screen. This is found in the "light-sensitive cell," a device which will allow elec- genuine nickel and iron elements which tric current to pass through it when gives to your receiver greater power void light is shining on its electrodes and which shuts off this current the moment the light ceases. Second, a method for having radio currents control a relay. The vacuum tube detector does this. A relay placed in its plate circuit will respond when incoming signals affect its grid, and of course this relay can be made to close any other electric circuit that we may desire. The third requirement, and the most difficult one to attain, is exact synchronism of the speed of the carrier for the transmitted negative and the carrier for the received

one train were looking through a

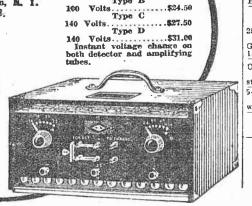
A little simile will explain what is meant. Suppose two express trains were moving along, side by side, on parallel tracks, and that a person in

THAT'S PERFECT!

An alkaline "B" battery using the of disturbing noises. It is rechargeable—its life unlimited. The ideal battery for the new Cunningham and R. C. A

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Туре А

100 Volts......\$21.50 Type B

by the transmitter to hold back the

By Major Edward Bowes

Describing a little more in detail mitted is in the form of an ordinary picture camera. It cannot be de- feet above Geneva, an observatory negative, mounted in a rotating ceived. It reflects exactly what is and wireless station. cylinder. This cylinder rotates brought before it. To my mind, therefore, a successful radio enteralmost one revolution, then slides tainment must be built on a foundation of sincerity and good faith.

In radio, as in every other art and lary, and but few have heard the same speed and the telescope was of this negative, and the light that tainer or entertainment is immediately followed by a flock of imitators. the actual apparatus which the word twises. It will be of interest to begin with, it would be possible for this passage to a light-sensitive cell. But, although they follow the particular example to the letter, they will never truly register; they will always remain imitators.

I believe that every radio unit should attempt to do only the thing which it typifies and which it alone can do best. Each man must be himself; he must be sincere and give his best, and he must be content to stand or fall by virtue of his own personality and his own technique. There is room for many different' types of entertainment on the air, and each can be successful if he does his own particular thing in his

In presenting the programs at the Capitol Theater one is confronted with more than the job of mere announcing. It is necessary to strike a certain keynote; to create an atmosphere which will be an appropriate setting for the kind of music and entertainment that the Capitol family stands for; to lend a definite individuality to the programs.

toward the attainment, perhaps not the observer to read the paper con- | Hence, where the negative shows | be ourselves. We have to remember so many years in the distance, of tinuously. But, of course, every one white, light will pass; where the always that a great audience is listenreal tele-vision, but it admittedly is appreciates how difficult it would be negative shows black, light will not ing to us, an audience made up from to maintain the speed of two trains pass. The light sensitive cell in turn every walk of life, from the prosper-In the system used by the Radio exactly the same for any length of controls a relay, and for a light spot ous business man in his suburban Corporation of America a photo- time, even though both engineers on a negative a dot is sent out, and home to the isolated farmer by his graph is taken of whatever scene, or could watch each other's movements for a dark spot nothing at all. The lonely fireside. We try to strike a radio transmitter, in the end, is con- happy medium—a level that will be other picture one may desire to trans- Now let us make the problem trolled by this relay, and sends out human and entertaining, that will mit. This negative is placed in a harder. Assume that each engineer dots whose spacing corresponds to have something in it for each listener.

> offer in the theater. And, similarly, coming radio signals affect a detector necessary, and imagination. And so and it in turn operates a relay in its to each program we try to bring plate circuit, and the relay finally a freshness and spontaneity that will

space on the negative of the distant an adventure on the air. As time goes on, the various eletransmitter causes the fountain pen ments of radio entertainment will ceiver paper at just the right point gradually be standardized and

out at the end of each series of dots | Sincerity Keynote | changed. But as we go on we find that it is pretty safe to be guided Of Radio Success | by this principle: Do that which you can do best, and do that the best way

> Managing Director, Capitol Theater | The French government will build The microphone is like the motion on Mount Saleve, which towers 4,000





Radio Exchange

Rate, 40 cents a line; minimum, 3 lines. Agate caps and white space only display permitted. Ads. accepted until 12 o'clock noon Friday.

PHONE PENNSYLVANIA 4000

Parts and Equipment

vention of Captain R. H. Ranger, one of the engineers of the Radio Corporation of America. He has worked on the problem for a long time, meeting, as inventors always do, with failure after failure, and an occasional flash of success. But his results now are always successful, for

BUYS 100 - VOLT KNOCKED - DOWN STORAGE B BATTERY UNIT. IN-CLUDING CABINET, CONSISTING OF EDISON ELEMENTS WITH NEW TYPE CONNECTOR. ALL OTHER PARTS CARRIED IN STOCK. WHOLE-SALE AND RETAIL. SEND FOR LITERATURE. ROMCO STORAGE BATTERY CO., 146 WEST 68TH ST. PHONE TRAFALGAR 5826. 100 VOLT UNIT, \$6.00; 100 volt knock-down complete, \$10.50; postage extra. Roberts, 1122 Myrtle Ave., Brooklyn. Bushwick 6753.

5 TO 40% off on Brunswick Radiolas Superheterodynes, Victrolas, Records

Superheterodynes, Victrolas, Records. Greenberg, 3891 3d av. (172d). Bingham 1360

n these columns for this WEEK'S BARGAINS.

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BUY DIRECT from factory at lowest prices. All kinds of CONSOLE CABI-NETS and RADIO TABLES. Made by expert mechanics to your order. Open

Parts and Equipment

Photo radio receiving apparatus

Reference of discharged without its being charged in the least. The Sec-Ostructed from genuite alka and make the faults of the original models, one by one, until to-day the system is sufficiently perfect to be placed in commercial conditions. But this is exactly what the photo-radio apparatus has to do charged of discharged without its being charged in the least. The Sec-Ostructed from genuite alka and make the faults of the original models, one by one, until to-day the system is sufficiently perfect to be placed in commercial to-day the system is sufficiently perfect to be placed in commercial conditions. But this is exactly what the photo-radio apparatus has to do charged of discharged without its being charged in the least. The Sec-Ostructed from genuite alka and make the faults of the photo-radio apparatus has to do charged of discharged without its being charged for the charged of discharged without its being charged for the charged of discharged without its being charged for the photo-radio apparatus has to do charged of discharged without its being charged in the least the faults of the photo-radio apparatus has to do charged in the least the fault

Service

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mous 4-tube Ambassador, using all gen-uine Ambassador parts. 5-tube radio frequency set with high-class equipment, \$45 complete. RADIO SERVICE SHOP, 762 MELROSE AVE. OPEN EVENINGS. MELROSE 4632. PHONES, loud speakers remagnetized; sets repaired; weak tubes that light revived, 50c. Roy's, 100 W. 46th st. Bryant 0985.

Hryant 0985.

BATTERIES FULLY CHARGED, 35c.
Called for and delivered. Batteries rented and repaired, Plaza 2069. Spencer Battery Service, 888 1st av. (50th). Service, 888 18t av. (30th).

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A limited number of factory built
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MODEL No. 301, 0-71/2 AND 0-150 VOLTS IN ORDER to get the most in tone, volume and distance out of your set you should always know the true condition of your A and B Batteries and at what

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LIST PRICE \$10.00 EACH **OUR PRICE**

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This you can know by using one of these beautiful WESTON METERS, which are complete with external resistor and are manufactured by the well known WESTON ELECTRICAL INSTRUMENT CO. OF NEWARK, N. J. They are constructed on the world fa-

nous WESTON permanent magnet pivoted

radio shows this week reveals the speaker, this type having demonfact that the sets in their funda- strated perfect acoustical properties. movable coil principle. mental electrical aspect have suf- The old irritations of rattling and These instruments are designed to be fered little change, while in external "sand blasting" have been obviated mounted on the panel of the Receiving Set appearance and mechanical equip- capable of reproducing without the and are of the Flush type in order that ment they have undergone note- slightest distortion orchestra music they may not protrude in front and yet add to the appearance of the set. The very first thing that strikes Even musicians who have heretofore If a Multi-point switch is employed the

the observer is the evident refine-cally impossible now freely admit Voltmeter may be connected at will across A or B Batteries or tubes, depending upon ment that has been made in the set that radio sets deserve unqualified the number of points on the switch. housings. Whereas heretofore the classification among "musical instru-Every meter is brand new and guaranteed. Packed in original cartons. dominating note in cabinets has been ments." EXTRA SPECIAL PRICE \$4.75 EA. simplicity of both material and outline, now it is concerned with deco-

> ration and embellishment. Even the modestly priced sets have Significant achievements have been shed their straight-sawed, barren made in the application of house curboxes and now boast prettily fitted rent to the filaments and plates of the scroll work, duo-colored inlays and will continue to be used for a long glass-like piano finishes. The de- time, already a number of completely signers have exercised commendable current-operated receivers have been restraint in wielding their pencils, put on view. They work quietly and and almost without exception the efficiently, and display none of the products of the wood-working de- hoarse, humming noises that have partments of the radio factories are characterized many experimental tasteful and conservative in design. affairs of similar construction. These The many women who have until now power outfits are more or less limited objected to "radios" because of their to circuits employing five tubes or ugly and forbidding appearance will more, and considering the converevel in choosing among sets that are nience they afford, are well worth fully as decorative as any expensive the prices asked for them.

Of course there still remain many low-priced receivers which retain plain boxes. No attempt has been without number, their manufacture made to improve on these because having been greatly encouraged by their appeal mainly is their cheap- the recent appearance of suitable ness. On the other hand, manufacturers seem to realize that radio is highly satisfactory and betray no appealing more and more to people of hint of humming or other disturbmeans, and they are now furnishing ance. Chemical eliminators in a their receiving units in cabinets of number of forms have been in use unprecedented beauty and magnificence. Period models, until recently favor. Many of the eliminator units attempted only by a few companies are obtainable in knock-down form hopeful of attracting an occasional for home assembly. rich customer, are now evident in

profusion and variety, and in prices varying as high as \$2,000.

Improved Mechanical Arrangement The receivers themselves show the tremely powerful, the other moderresult of careful mechanical arrange- ately so, is designed for attachment ment and construction, particularly to any radio receiving set using at in the matter of dials, condensers and least a single stage of amplification, general simplification of control, and when so employed provides loud Where round dials have been retained and unblemished reproduction. The they are more graceful and easier to device does not remove the necessity handle than before; in a great for A and B batteries in the external many sets they have been replaced receiver, but it does end the problem altogether by small knob-operated for the audio-amplifying system. pointers traveling over fancy scales The complete A and B battery or by knob-actuated rotary scales, eliminator, capable of external cononly small sectors of which are nection to any existing set, does not visible for observation through neat seem to be completely developed. little glass windows. On many of There is at least one such device the scales space is provided for the being advertised, but few radio records of various station adjust- people have seen one in operation. ments, which can thus be duplicated Providing it does not require a reinstantly without reference to an wiring of the set, it should prove

highly popular if it works at all. Some of the very newest scales are In general the trend in radio seems drum-like in shape, and revolve to be toward the complete factoryparallel to the horizontal plane of the built receiver housed in an attractiv panel. These, too, allow permanent cabinet and furnished with a good record of station setting. Still loud speaker. Selectivity and quality another style makes use of a narrow are the most desirable features, the rectangular scale attached to the inordinate craze for extreme distance panel in an upright position, with a regardless of quality apparently pointer traveling up and down in a having died away. The home set small slit through its center. In all builder by no means has gone out of cases the devices are highly pleasing existence, for radio holds just as in appearance, many being gold- much of a fascination for him as it

An outstanding technical accom- has become so popular in the average plishment has been the development household that even the most enthuof straight line frequency condensers, siastic fan keeps a complete receiver which permit more convenient and available for general family service comfortable tuning than the old independent of his own precious coltypes. These have been adopted to lection of junk in his bedroom. Many of the people who buy commercial sets of many kinds.

Uni-Control Sets

The simplification of control in tuning dials from three to two and to the pastime, while many erstwhile tuning dials from three to two and experimenters reverse the procedure even one will earn many expressions and purchase ready-made sets. The of approval. A number of the popu- continual change keeps interest in lar models of tuned radio-frequency both experimenting and in complete receivers have been affected in this receivers high. respect, while the super-heterodyne in particular, formerly the most complicated and imposing of all sets, has

Negro Program been successfully compressed into A number of leading colored mupractical single knob operation. sicians will be heard on the air at Elimination of one or two controls 9:30 Tuesday evening, September 15, of a total of three is in some affairs when a special program given enoptional, engaging and disengaging tirely by Negro artists, will be coupling mechanisms being provided radioed from WGBS under the direcfor the convenience of the set owner. tion of the "Amsterdam News," lead-The loud speaker as an individual ing colored daily.

later and start experimenting with

all the coils and condensers incidental

Improved Appearance Marks LASTING SERVICE New Models of Radio Sets

in the new instruments, which are

as loud as the original playing.

The cones will win favor also from

a mechanical standpoint, as they are

short and shallow and available in

receiving tubes. Although batteries

B Battery Eliminators

There are external B eliminators

varieties of colors.

Decorative Eqoipment Removes Scientific Air of

the Instruments; New Speakers and Bat-

tery Eliminators on Hand

PRELIMINARY examination | item has probably received more im of the new 1926 radio re- provement than any other. Almost

ceivers on exhibit at the every large and important manufac-turer is now marketing a cone

Stromberg-Carlson \$180

A RADIO SET THAT STANDS UP UNDER ALL CONDITIONS, GIVING YEAR IN AND YEAR OUT SERVICE OF CONSTANT SATISFACTION. SPECIALS

RADIOLASUPER HETERODYNE \$146 COMPLETE WITH HERALD SPEAKER ATWATER KENT MODEL 20 \$115 FADA New 5-Tube Neutrotyne \$122.50
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sets become bitten by the radio bug 130 Liberty St. One Block South 59 Cortlandt St. In Elliott's Drug Store We carry a full line of Standard Merchandise.

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Speakers and Sets Repaired, Adjusted & Exchanged We carry in stock one of the larges lines of Radio in New York. INDEPENDENT RADIO & ELECTRIC COMPANY.
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65 West 18th Street.

The Second Annual Radio World's Fair Opens Tomorrow Afternoon

The World's Largest Hall, the 258th Field Artillery Armory, to House the Year's Exhibit

BY ERIC H. PALMER

An interior view of the 258th Field Artillery Armory where the Second Radio World's Fair is to be held

MID a setting that in magnitude and splendor will prove a revelation to the visitors who will be received in this, the Radio World's Fair will open to-morrow evening at 7 o'clock in the 258th Field Artillery Armory Kingsbridge Road and Jerome Avenue, in the Bronx-in the center of a thickly populated district of the metropolis and within easy access of the entire metropolitan zone.

Here we find the largest hall on earth, a fact that within itself is a testimonial to the strides made by America's new billion-dollar-a-year industry, Radio. The armory is five times the size of Madison Square Garden, which last year proved much too small to accommodate the first Radio World's Fair, requiring the rental also of the 69th Regiment Armory. Every inch of the vast auditorium, 600 feet long, 300 feet wide, and with the ceiling 195 feet from the floor, will be utilized for displays of extraordinary interest to the veteran wireless engineer, and particularly to that enormous and enthusiastic army known as the radio fans of America. New devotees of broadcasting will be amazed at the exhibition. There will be 300 separate showings and demonstrations of everything that is new and much that is historic in the field of radio.

Before the doors are opened at least \$250,000 will have been spent by the trade and the management in the exhibits, decorations and administrative expenses.

Manufacturers will present for the first time their new lines of receivers, in booths that are masterpieces of decorative skill, many exceeding in sheer beauty the famous attractions of the Paris Exposition. Multi-colored lights will play upon hundreds of sets that will evoke the enthusiastic plaudits of women as well as the admiration of men, for this year the cabinets will be distinctive and appealing, ornaments to the home to grace the livingrooms and not be hidden in garrets, as were the first nondescript receivers.

Overhead will hang a silken canopy, costing \$40,000, with several thousand bulbs glimmering amid the folds.

World Radio History

Governor Alfred E. Smith will declare the fair officially open, before an audience that may reach 50,000, within the building,

and probably 2,000,000 listening in as the proceedings are broadcast.

The preliminary concert and the addresses will be broadcast by WAHG, one of the stations broadcasting from the fair, in rotation, and the entertainment for the faraway fans will be maintained until 11 o'clock, the closing hour.

On behalf of the Radio World's Fair, and also representing the radio public, Governor Smith will present trophies to a number of notables. The full program is a secret, but this much is known: First of all, he is to greet and honor "Miss Radio-1925-'26," winner of the competition conducted by the World's Fair to determine the most interested, enthusiastic and successful feminine fan, in recognition of the special concern that women now entertain in the development of radio. "Miss Radio"-the Diana of DX-verily the goddess of the exposition—is petite Rena Jane Frew, of Beaver, Pa., twenty years of age, a wireless operator since she was sixteen and the heartiest of enthusiasts for broadcasting.

Miss Frew will address the visible and invisible audience. During the week she will be the guest of the exposition and radio clubs, to be entertained at teas and theater parties.

Governor Smith was also to have tendered the trophy emblematic of championship, announcing honors to Graham Mc-Namee, winner of the national popularity contest, amid the plaudits of his colleagues from many stations, but the ceremony was postponed until Saturday night, as one of the principal closing features, Mr. Mc-Namee is recovering from a recent opera-

Another famous agure in radio, whose voice is familiar to millions, Major J. Andrew White, announcer of the leading sporting events and pioneer in radio, then will be presented and given a loving cup as a testimonial from 50,000 or more ad-

Probably Bernays Johnson, radio engineer and inventor, who has just returned from a tour through Europe, may make known some of the wonders he will display at the show.

Indeed, Mr. Johnson will be a central figure throughout the week, for he predicts | will be relayed to a chain of stations,

that his newest devices will revolutionize housekeeping-that we are entering the radio age in the conduct of industry like-

radio lamp.

This is explained in this wise by the inventor:

"A whole house may be illuminated from a special radio transmitter. There will be no wiring at all. Every light in the house, even large lamps bearing five bulbs, may be carried from floor to floor. People will be able to carry electric lights as they used to carry candles. As they move the radio beam will maintain a

"What I needed for this new invention was a salt which would do away with the ultra-violet ray. This salt I found while in Calais.'

After viewing the wonderful display of receiving apparatus all visitors undoubtedly will want to meet the famous stars of radio, stage, screen, the arts and the sciences, who will gather in the reception parlors and studios maintained by the broadcasting stations. Thanks to the immense size of the auditorium, each station will have its own "home."

The Crystal Studio

In the middle of the armory will be the crystal studio, the largest broadcasting room ever built at an exposition, through whose glass sides the public may see the actual broadcasting of music and song and hear it from the amplifiers on the sides of the hall.

From the engineering standpoint the feature broadcasting by so many stations from the Radio World's Fair has set a standard. Several thousand dollars were spent in the connections and telephone wire equipment which made the tie-up possible. The services of a hundred men are required to handle the broadcasting. Twenty well known metropolitan announcers will be on hand. Major White will be general director.

Stations co-operating and sending out star programs are as follows: WEAF. WOR, WAHG, WBOQ, WMCA, WHN, WRNY, WOKO, WGBS, WEBJ and WNYC.

It is anticipated that some programs

abut which announcements will be made during the week. Stations in the Middle West are to dedicate programs to the Radio World's

Fair and will be picked up at the armory. In recognition of the foreign exhibits consuls from twenty countries will participate in the exposition. There will be greetings also from a hundred notables

During the week conferences will be held by manufacturers, dealers and jobbers and other allied trade interests in the forum that will be a feature of the show.

in the field of diplomacy, politics and in-

These will be conducted from 11 a. m. to 1 p. m. The public will be admitted

from 1 to 11 p. m. It is estimated that not less than 50.000

school children will attend from New Jersev and Connecticut as well as from New

Amateur Contests

Special contests for amateur set builders for valuable prizes will take place each afternoon. Jack Hartley, the Brooklyn boy who captured the honors last year, will be on hand to aid in instruction. And, no matter how far one may be from the spot, these contests can be viewed while walking through the hall, as there are no pillars or posts in the armory.

Months have been spent by the management in the organization and perfection of the exhibition.

As managing director is U. J. Herrmann, who has the backing of the Radio Manufacturers' Association in the annual Radio World's Fair and the Chicago Radio Exposition.

"This has placed a great responsibility mon us." said Mr. Herrmann last evening at the fair headquarters in the Hotel Commodore, "but I am quite sure the pubiic will approve all that has been done to make this the finest radio show ever held."

The general manager is Mr. Herrmann's partner, Clay Irwin, who has been "the busiest man in radio" the last few weeks, having charge of a thousand details about which the public may not be aware in the conduct of a large enterprise. Aiding Messrs. Herrmann and Irwin is

(Continued on page eight)

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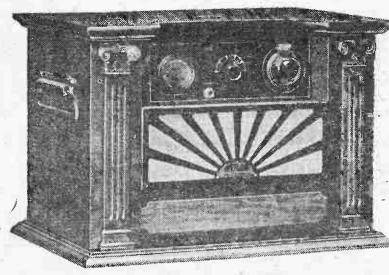
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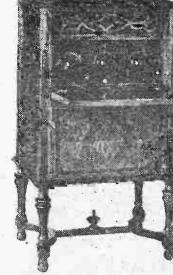
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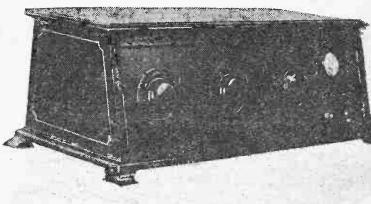
Radio Apparatus and Receivers on Display



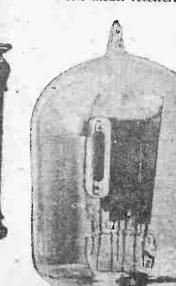
This year the Operadio Corporation will introduce a new type of portable receiver which is primarily designed for use in the home. The receiver operates from a loop antenna with six tubes. The batteries, loop and loud speaker are fitted into a finished cabinet, thus making the set easy to move from place to place.



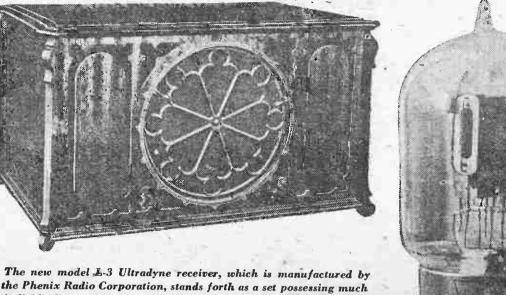
The Electrical Research Laboratories (Erla), of Chicago, is to exhibit the new Deluxe Console model receiver.



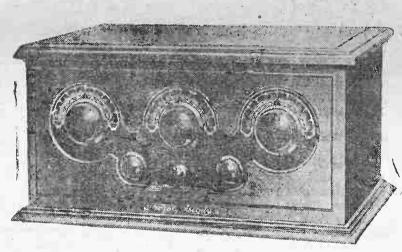
The Garod Corporation, Newark, N. J., will continue to manufacture their V and Georgian models at the request of the public and their distributors. Above is shown the Garod V five-tube neutrodyne receiver, for which beauty, selectivity, control of volume and clear reproduction are claimed.



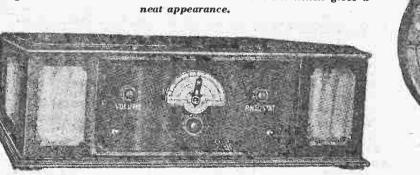
The new "Batteryless" radio receiver which was recently announced by the Miessner Radio Corporation is to be exhibited at the show this week. The set operates directly from the house current socket and consumes but eight watts, which makes the approximate operating cost a tenth of a cent an hour.



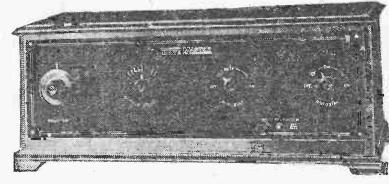
the Phenix Radio Corporation, stands forth as a set possessing much individuality in design. It has no dials, but rather two small levers, which run parallel to the periphery of the grill. The set employs six tubes in a radio frequency circuit and is very easy to tune.



'A new feature in the radio industry is the introduction of thorola coils adapted for radio reception. A set employing the use of these coils will be exhibited by the Reichmann Company of Chicago. It is inclosed in a Circassian walnut cabinet which gives a



The model B Mu-Rad manufactured by the Mu-Rad Radio Corporation of Asbury Park, N. J. is a one control five-tube receiver. It is claimed that this set gives clear life-like reception with volume sufficient for all purposes. The set is supplied in several different styles of cabinets by the manufacturer.



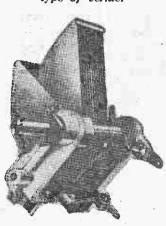
A new receiver employing an entirely new method of tuning the radio-frequency stages is to be exhibited by the Kellogg Switchboard and Supply Company of Chicago. The receiver is tuned with a variometer arrangements instead of variable condensers, thereby giving only two tuning controls.



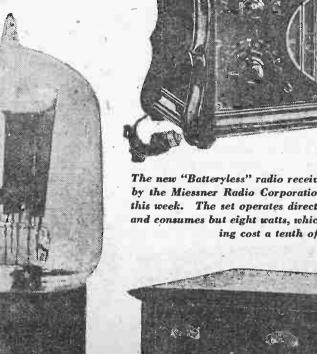
One of the problems radio tube manufacturers have tried to solve is shrinkage in transportation, due to dislodged elements. The Schickerling Products Corporation has designed a tube eliminating shrinkage. A model six feet in height will be on exhibition this week.



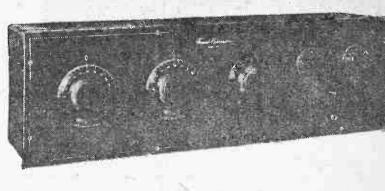
The Pacent Electric Company are introducing to the radio public the Microvern, a new type of vernier



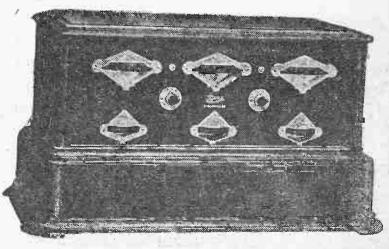
A new design of straight-line frequency variable condenser made by the Hammerlund Manufacturing Company



At this year's radio show the Eagle Radio Company will present their new Model F neutrodyne. On the panel of this set there is a selectivity control, a volume control and a clarity control in addition to the three tuning controls. The radio-frequency transformers on the set have been improved to make possible better results on short wave lengths.



This radio receiver is to be known as the NR-7. It is the newest model to be manufactured by the Freed-Eismann Radio Corporation and employs several new features. Six tubes are used with a novel method of audio frequency amplification which provides flawless tone quality.



Externally the Grebe 1926 Synchrophase is the same as last year's model; however, the new set embodies many new features. The receiver is equipped with an automatic wave length range extension circuit which provides a tuning range of 150 to 550 meters. In addition the "color-tone circuit" improves reproduction and the flexible unit control simplifies tuning.

Brownlees Get Into a Mix-Up

(Continued from page one)

mush! It's getting so, nowadays, a

"Round 2!" cried Bud Griffin.

"The daisies and the violets

Leap up to greet the spring." "Slush!" cried Mr. Brownlee bit-

terly, twisting the dial. "Slush!"

"Edward Brownlee, I will not have

Murchison Has Enough

"I think, perhaps, I'll go now," said

"You'll do nothing of the kind," de-

stay, and you'll hear what you came

showed who is master in this house,

and moved delicately toward the door,

many burglars about these days-

"Benk sends a jarring wallop to

"For the third and last time,

hand from this dial?" Brownlee asked

"Say nay, my soul! Say nay, my

Gives His Radio Away

"Very well, then!" said Brownlee.

behavior I shall not say, for I am a

gentleman. I will leave you to listen

to your mushy poetess, Sophia, and

listen to a poetess of the soul!"

"Great Scott!" exclaimed Brown-

lee. "If that's so why don't you go

But Murchison did not go in the

in the house again and hear her?"

Coogan fight from the ringside, AKG side. "The contestants seen announcing," said the voice. "The angry." huge auditorium is filled to its "I'll not let go! I own this radio utmost capacity; I notice many of don't I?" demanded Mr. Brownlee. the notables of the sporting world "What do you think this is?" present; Butcher Benk has just "This is Station KZKX," said the climbed into the ring-you can hear radio, "ABJ announcing. The next the cheering. He is bowing to his selection by Miss Dora Dovell, the friends. The louder cheering you soul poet, will be"hear now is for Farmer Coogan—he has just entered the ring and has Griffin, broadcasting at 360-meter thrown off his bathrobe. Both men wave length from the ringside. seem to be in prime condition. Benk "I think it is a most shameful is now leaning over the ropes to piece of behavior; that's what I think, shake hands with Gus Tubbert, the Edward Brownlee," said Mrs. Brownpromoter of the fight. Now Mr. Tub- lee. "If I cannot bring a friend to bert is shaking hands with Coogan. this house"-Benk's trainer has drawn him into a "And what about my friend?" de- See the corner of the ring and is whispering manded Mr. Brownlee angrily. "I've Brightson

"Edward!" said a voice from the doorway somewhat sharply, but Mr. Brownlee did not turn.

"Edward!" said a voice from the doorway somewhat sharply, but Mr. Working and you can rush in and cut show, Grand Central

"Keep still, please, Sophia," said on a lot of mush-yes, mush! that's Mr. Brownlee pleasantly, "the fight what I said. I said mush, Mrs. is just beginning and we don't want Brownlee. A lot of pifflicated, poetic

"Edward," said Mrs. Brownlee a man has no rights in his own home." little more sharply, "will you please | "Edward Brownlee! Stop right pay me enough attention to notice there! That's enough!"

"Sophia," said Mr. Brownlee, "I "Both scrappers still in good condidon't want to seem rude, but when tion. As the gong rings"you talk I can't hear what"-At that moment a haughty voice

from the hall said: "I think I had better not stay, Sophia, dear. Evidently your hus-

band is so deeply engaged that he berry's favorite poetess!" cried Mrs. "Jane! What nonsense!" cried Mrs. Brownlee. "I invited you here to hear Dora Dovell read her poems and you shall not be disappointed! the meek Mr. Murchison.

hear Dora Dovell read her poems over clared Brownlee, angrily. "You'll Mr. Brownlee turned and saw West- here to hear-a prizefight and cote's society leader entering the mushy mush. It's about time I

Edward, Mrs. Bimberry has come to

"Butcher Benk and Farmer Coogan once and for all. Sophia, take your have now stepped to their corners. hands off that dial! Do you hear me? This is WPX, broadcasting from the Once! Twice! For the third and last ringside. But Griffin, the sport writer time"of 'The Star,' will now describe the "I'll not. I asked Mrs. Bimberry to fight for you, round by round and come here"blow for blow. I introduce Bud Mr. Murchison got out of his chair

"How-do-you-do, Mrs. Griffin," said like a cat walking on ice. Brownlee and hastily corrected him- "I really think I'd better be going," self; "I mean Mrs. Bimberry. Just he said, coughing his apologetic little in time! The fight is just beginning." cough. "I left my wife all alone—so

"Fight!" exclaimed Mrs. Brownlee. letter to mail—expecting a telegram "Do you think Mrs. Bimberry has -really must be getting along"come here to listen to a brutal, cruel In her easy chair the haughty prize fight, Edward Brownlee?" Mrs. Bimberry sat with sternly com-

"Sophia," said Mr. Brownlee, "I pressed lips. She did not mean to deasked Murchison to come here and sert her dear friend Sophia-a memlisten in this evening. If you think ber of her own sex-who was doing two red-blooded men are going to sit battle for her. Mr. Murchison might here and listen to a wishy-washy run, but she did not mean to run. She poetess read her silly poems"--- cast a glance at Brownlee that let

"Coogan and Benk shake hands," him know quite plainly what she shouted the radio. "They go to their thought of his behavior. Brownlee corners. The gong rings. Coogan gave the dial knob one last vicious jumps to the center of the ring. Benk twist. comes forward crouching. Coogan swings with his right. The blow" Coogan's chest," shouted WPX. "-as sweet as buds in April dew

Responsive flows from me to you, Sophia, I ask you-will you take your And gentle as a cooing dove The echo murmurs "This is love!'" in a dangerously quiet voice. For It was the honey-sweet voice of the answer Mrs. Brownlee twisted the

peerless poetess, Dora Dovell for dial knob. Mrs. Brownlee had touched the dial and changed the wave length to 400, heart! Say nay, and ever nay!" which was that of the admirable station KZKX from which the peerless poetess was broadcasting. A dark frown gathered on the brow of Mr. releasing his wife's hand. "Very Brown lee: he put his hand over the hand of Souhie hand of Sophia.

"Let go," he whispered tensely. "I'll not! I'll not!" whispered Mrs. Brorwnlee.

you need not wait up for me. I am "Ah! dearer far tan precious stones going to the club, where a man has I love the song thy voice intones, some rights. But this I will And quickly to they arms I fly say, Sophia-never, although I live to be a thousand years old, will I

Two Kinds of Fight

"Brownlee," he said, "I'm very "Coogan biffs him in the eye," sorry to have been the cause of this shouted Bud Griffin, as Mr. Brownlee twisted the wave length back to 360. quarrel, because I would have length back to 360. preferred to hear Dora Dovell. To quarrel, because I would have much "Benk uppercuts to the eaer. Coogan tell you the truth, Brownlee, Dora feints with his left and drives his Dovell is my favorite poet, and I am right to Benk's ribs. They clinch. passionately -- yes, passionately --They break"fond of her poems."

"To part! Ah, this is sad indeed When closer union is our need. But still in peace my eyes I'll close

"Coogan reaches Butcher's nose," house again, and it would not have shouted Griffin from the ringside. done him any good if he had gone, "The Butcher replies with a short jab for—as soon as the two men had to the stomach. Coogan spars. Benk closed the front door-Mrs. Bimberry had spoken to Mrs. Brownlee:

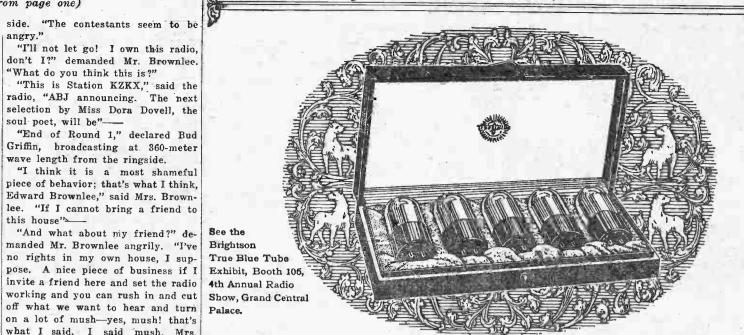
"Edward! Edward Brownlee, let go Let's listen to the prizefight; I'd of this dial!" exclaimed Mrs. Brown- much rather hear the prizefight, ee, tugging at it.

"Everybody is becoming excited,"

"So would I," said Mrs. Brownleee,

declared Bud Griffin from the ring-truthfully.

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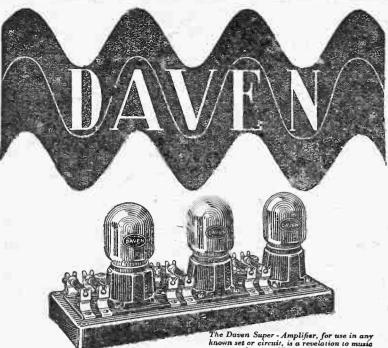
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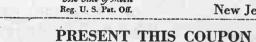
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and finished off with two-tone line cuttings. The grill in the center, which conceals the loud-speaker horn, is a statuary bronze color and is

backed by a meshing of dull gold. The new Ultradyne employs six acuum tubes of the 6-volt 14-ampere type. The first three function as radio-frequency amplifiers, the fourth as detector and the last two as audiofrequency amplifiers. Automatic filament controls take the place of rheostats, and this has simplified the operation of the set a great deal.

The first two stages of radio-frequency amplification are tuned while the third stage is fixed. A special resistance system of stabilization is utilized which prevents these circuits from oscillating at resonance points.

The use of straight line-frequency condensers results in an even distribution of wave lengths over the entire scale readings. Furthermore, the lever system of control provides vernier action of a new order.

An All-Wood Loud Speaker The Radio Cabinet Company, Indianapolis, Ind., has placed on exhibit at the National Radio Exposition a new type of loud speaker to be known as the all-wood orchestrion de luxe radio loud speaker. This speaker, it is said, is the first and only loud speaker to be entirely made of wood and as a result it is claimed that remarkably clear reproduction

Molded Radio Parts

The Auburn Button Works, Inc., was founded in 1876 for the manufacture of buttons, which were molded from shellac composition. The raw materials of the company are now bakelite and celluloid in place of shellac compositions. The firm is now manufacturing parts for radio apparatus, such as tube sockets, bases, dials, knobs, binding posts, etc. These bakelite molded parts are usually black or brown, but they may be green, mahogany or mottled color. These parts are on exhibit this week.

A Tube Exhibit

Radio fans interested particularly in tubes can learn all about what they look like inside, how each part is made and how the whole thing is put together in order to produce the finished product at the radio exposi-

The Gold Seal Products Company has set up an entire tube manufacturing plant where every step in the process of making tubes will be carried on in view of the visitors to the

A Battery Chargers The 1926 models of the Apco Manufacturing Company's radio apparatus include several items which should be of interest to the radio enthusiast. The new type Apco A battery charger, which is now on exhibit, is attractively housed in a black-enameled metal case. This case is designed to enable the user to observe the action of the contact pins and, if necessary, to adjust the vibrating unit without removing the cover. The charger employs an automatic kickoff, is selfpolarizing, and also provides the battery with a tapered charge.

In addition to the A battery charger a B battery charger also is manufactured by this company. This is an independent unit, which uses the same principle of charging as does the A battery unit. Its charging rate is from 1-10 to 1-14 of an ampere, and it will fully charge a 100volt B battery in ten hours. Another item featured in the Apco line is the B battery eliminator, which employs two ordinary vacuum tubes and supplies the plate potential direct from the alternating-current house line.

Sockets for New Tubes This fall the tube makers are oringing forth tubes of somewhat changed design, in that the contact prongs are longer. The "sidewipe" type of socket is therefore in order, and to meet this demand a new line of Radion sockets is appearing. These new sockets are made in four styles to accommodate both old and new

tubes as well as to meet the situa-

tions arising from the change from

Thermiodyne Booth One of the very attractive display booths at the Grand Central Palace is built around the beautiful old legend of Aladdin and his wonderful lamp. The setting reproduces a desert scene with sand wastes in the foreground and palm trees and setting sun in the background. Aladdin and his everfaithful Genii are effectively grouped with the latest models of Thermiodyne sets. The spirit of the desert has been faithfully reproduced in this interesting exhibit.





Superadio Dynometer

Have Your Tubes Tested

FREE at SPACE No. 100

Grand Central Palace

The Dynometer measures the power

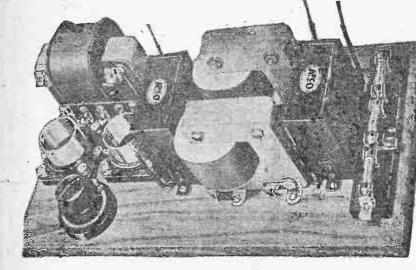
of any vacuum tube. No calcula-

tions. No curves. Tests 3 tubes per

DeWitt LaFrance Co., Inc.

Cambridge, Mass.

minute easily and accurately.



The Thermiodyne Radio Corporation is presenting its neu

It is also noted for simplicity of tuning

The Charles Freshman Company's Model 5-F-5 radio receiver em-

ploys a circuit similar to the one used in the well-known Freshman

"Masterpiece." The set has a built-in loud speaker and uses five

tubes, two as radio frequency amplifiers, one as a detector and the

The latest model of the Crosley Radio Corporation, Cincinnati, is

the Super-Trirdyne. This set is housed in a solid mahogany cabinet

which also contains the necessary A and B batteries. The electrical

and increased selectivity. It employs three tubes.

The New Jewett Radio Receiving Set, which embodies both beauty

and simplicity, is now on exhibit. This receiver is manufactured by

the Jewett Radio and Phonograph Company, Detroit, and is said to

be very efficient. It employs five tubes in a tuned radio frequency

circuit, two as R. F. amplifiers, one as detector and two as audio

amplifiers.

remaining two as audio frequency amplifiers.

A somewhat different design of B battery eliminator is to be exhibited by the Apco Manufacturing Company. The device employs two rectifying tubes in circuit designed to rectify both halves of the cycle of the alternating current supply. This results oinan increase in power and efficiency

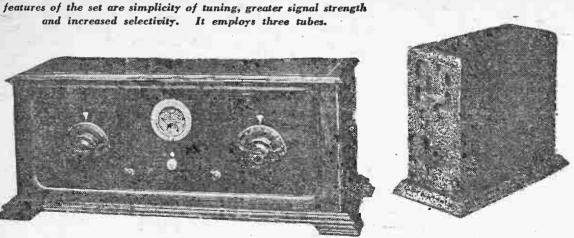


receiver which employs the new Weagant Circuit will be introduced by the De Forest Radio Company this week. The designers claim more perfect reproduction, greater beauty and increased efficiency for the

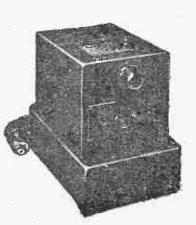
The De Forest W-6 broadcast



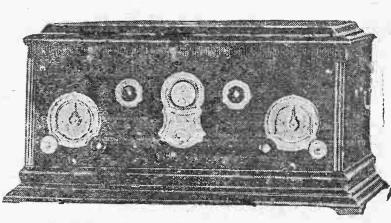
The Bruno Magic Dial, which is manufactured by the Bruno Radio Corporation, when atcircular plate condenser will make it tune like a straight line frequency condenser.



The Bel-Canto Manufacturing Company has developed a small loud speaker, to be known as the "Mite," which is said to be very efficient and which measures but 25% by 6 inches.



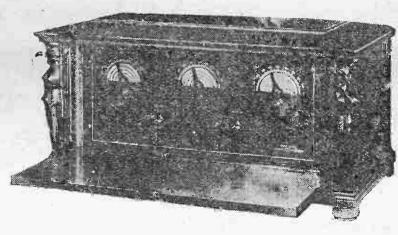
The Super-Ducon B battery eliminator, manufactured by the Dubilier Condenser and Radio Corporation, which operates direct from the alternating current house circuit, is on exhibit this week.



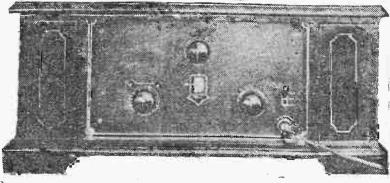
A.new six-tube neutralized radio-frequency receiver is to make its appearance at the Stromberg-Carlson Manufacturing Company's booth. Three stages of tuned radio-frequency amplification are employed. Each stage is totally shielded, which is said to insure maximum selectivity.



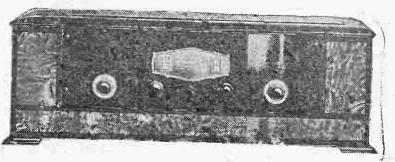
The Blair Model 11 radio receiver, manufactured by the Blair Manufacturing Company is a six-tube set employing a tuned radio frequency, a detector and three stages of resistance coupled audio frequency amplification, thus insuring volume, clear reproduction and distance reception.



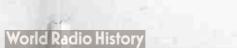
This four-tube reflex radio receiver, which is to be known as the Grimes Empire model, is made by David Grimes, Inc. Three stages of radio and three stages of audio-frequency amplification with a vacuum tube detector are used. Batteries are contained in the cabinet and the set may be used on either a loop or an outdoor



The Priess "Straight 8" is the new eight-tube receiver manufactured by the Priess Radio Corporation, which possesses remarkable distance-getting properties when operated from a loop antenna. It employs five stages of radio frequency and is very easily tuned by manipulating two tuning controls.



Considerable attention has been given to simplifying the panel and exterior of the cabinet and also to improving the tonal qualities in the American Bosch Magneto Corporation's new six-tube receiverthe Amborola. This receiver has three stages of audio amplification and the new power tubes may be used in the last stage.



problem of audio-frequency amplification is not new, so far as voice amplification is concerned. It has always been necessary to amplify voice currents in telephone work in order to increase the distance over which telephone communication can be held. But voice amplification, as in telephone work, does not begin to present the problems that audio amplification in radio gives to us. Before the broadcasting no one listened to music over the phone unless as an experiment. And, in fact, seldom did any one attempt to listen to any unfamiliar words. The listener could guess at what was being said, and the writer believes it was one of the telephone research engineers who once said before a distinguished gathering that all the sound which came over a telephone line was a mass of unintelligible noises dependent entirely on the imagination of the listener to translate these noises into words. As an example he suggested some one reading a lot of unfamiliar code words to a friend and marking the percentage of correct words recorded at the listener's end of the line. He predicted that the percentage would be extremely low, and probably zero. We are helped out on the phone immensely by a familiar voice and by familiarity with the subject matter

In radio, on the other hand, only the voice of the announcer is familiar. Even the subject matter may not be familiar. That we are able to distinguish as much as we do shows the great advance in audio amplification, with the use of the tube. With music only the vacuum tube has given anything like faithful amplification, and while the writer inclined to doubt the statements made that the tube itself will not distort sound, it is no doubt true that most of the distortion is due to the particular method of coupling tubes together to make an amplifier. We have, as already pointed out, transformer coupling and choke coil or impedance coupling, as well as resistance coupling. All of these distort to some extent, but most of us have ears which are not sensitive enough to distinguish the extent of the distortion.

Meaning of Distortion

It is well known that the amplifier at the broadcasting station distorts the signal before it ever goes out on the ether The more it is amplified in the transmitter the more it is distorted, just as in your receiver, the more it is amplified the less faithful is the reproduction regardless of what method of amplification is used. And regardless of what the amplifier puts out, the mechanism for changing this output into sound will cause some more distortion, whether it is a speaker or a pair of headphones. We cannot do away with distortion, but that is not so hopeless a state of affairs as might be imagined. Distortion is not such a terrible thing in small quantities. A bad cold is even worse from the hearer's standpoint. All distortion means is that some sounds are amplified more in proportion than others, so that we do not hear music, for example, as it is played.

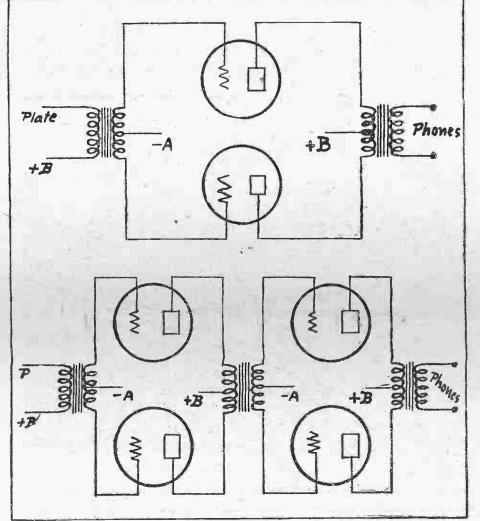
Probably, if we were right in the studio we might have the same trouble, and in the open air it is seldom that we hear the music as it is played. Certain instruments and certain sounds are accentuated. Some notes carry better than others. Some instruments may be heard much farther than others, and at certain distances some instruments are lost entirely, while others are heard. This is distortion in the same | proaches noise.

sense as we use it in connection with am-

With transformers and, in fact, with almost any means of coupling the tubes together the lower frequencies are not amelified anywhere near as much as medium frequencies, and very high frequencies are very largely lost altogether. The result as that low notes may seem weak and high sounds lose their timbre or quality. It is difficult to distinguish what instrumentt is playing the high notes because the only difference between instruments playing the same note is a difference in quality or tim-The fundamental note is always the same, but different instruments add to that fundamental other subsidiary notes, usually higher in frequency, called har-

We do not often stop to realize that every sound has some particular frequency, whether it is the beat of a tomtom or the sound of breaking china or chopping wood. By frequency we do not refer to rhythm. We refer to the vibration of the thing itself which gives a pitch to the sound. Striking a hollow trunk makes a different pitch from what we have by striking a solid tree. Striking an empty glass gives one pitch, and as the glass is filled with water and struck at intervals the pitch changes. In general the heavier the vibrating thing, the lower the note when it is struck.

In stringed instruments the heavier strings produce the lower pitches because



The wiring diagram for push-pull amplifiers

three, four, five or more times the frequency of the particular note being played. In fact there may be many harmonics, all of differing frequencies, which blend with the fundamental note and give the sound | a little ways, the string will vibrate more If one or more of these harmonics are missing the quality of the sound changes, and a piano, for example, may sound like a tin pan. It may be music. It may even be good music, but it is not piano music.

In some cases, even if the quality is gone, you may tell what the instrument is because there is no other instrument which makes sounds closely resembling those heard, but to be able to distinguish between wind instruments, between a clarinet and a cornet, between a saxophone and a trombone, between a piano and a harp, between a piccolo and a flute, between any two instruments capable of making very similar sounds, the listener must not lose any of the harmonics, especially if the music is soft. Usually the softer the instrument is played the fewer harmonics there are, and the nearer the sounds blend into fundamentals alone. It is when they are loudly played that all their eccentricities stand out, and frequently individual eccentricities in the construction of the individual instrument being played will distinguish it from others of the same make. Loud music ap-

monics. These harmonics may have two, | the vibrations are slower. These are the natural vibrations of the open strings. Now, if any one of the strings is shortened, or for the same effect the distance between supporting points is shortened, as by pressing the finger down the string This, of course, is the principle of playing any stringed instrument from a banjo to a violin. Two strings of unequal weight will produce the same pitch if the heavier one is short enough, even if both are under the same tension. On the other hand, decreasing the tension will lower the pitch, and decreasing it too much will result in no audible sound being given off because the vibration is too slow.

Upsetting of Qualities

Then we have the string which is of a definite weight, length and tension. It gives off a certain pitch when plucked, if it vibrates as a whole; that is, if the entire string waves back and forth through the air. Plucking it, however, makes a tendency for the string itself to bend and vibrate in sections. Each section gives off a note if this happens, and the frequency of these notes is in each case higher than the note of the whole string. If we obtain the whole string vibrating and each half of the string vibrating, we would have a fundamental tone and a single higher harmonic. If the string vibrated also in quarters we would have another still higher harmonic. If the vibration of the string is transmitted to some sounding board, as it is by the bridge over which the string passes, that sounding board may vibrate in sec-

motion results. The air wave is anything but a simple wave, and its complication varies with different instruments. It is this difference in complication that distinguishes one from the other, and the wiping out of one or more of these frequencies upsets the complication, gives new timbre or tone or quality to the resulting sound, and we say it is distorted. We might truly say a piano tone is a distorted harp tone. Distortion merely means an upsetting of qualities, a change in wave form or shape or complication. The harmonics, of course, are individually weaker than the fundamental, and an amplifier must be designed to retain these weaker qualities. A speakex

tions or as a whole or both, and the

result is that a very complicated air

must be designed to retain these weaker impulses and not to add other vibrations of its own. To retain the weaker impulses is a problem which is impossible of solution when they must be produced by a diaphragm, because the diaphragm has a natural period of its own, a definite weight of its own and a definite mechanical inertia. To make it vibrate at a very high frequency would require a very great force, a greater force than to move it at a lower frequency, and, as we have seen, the force available is weaker instead of stronger. We lose something there. Then in the horn, if it is permitted to vibrate at all, it may add to the forced vibration imparted to it by the air currents, another vibration of its own. For this reason horns are deadened by various methods, usually aiming to make their natural period very low.

Result of Amplification

In the amplifier itself we assume that the output of the detector is as faithful ε reproduction as we may obtain. One step of good transformer coupling makes little change in values, stepping them all up pretty much in the same proportion, not so much on the low notes, perhaps, but the loss is not greatly appreciable. A second step makes the loss more noticeable, a third step still more noticeable and so on. For that reason in nearly every amplifier the first step is retained and the variation in design comes in the following steps. We have shown how the resistance amplifier is added, how the choke coil amplifier is added, how the tone filter is added, and the diagram herewith shows how the push-pull amplifier is added.

A long while ago the writer gave a rule for connecting tubes. The input always goes to grid and filament. The output is always from plate and B battery. That is just as true in the push-pull as in any other form of tube coupling. The pushpull transformers, in effect, have a double winding. In the top half of the diagram a single step is shown. The secondary of the input transformer is a double winding joined together. One winding goes t grid and filament of one tube. The other winding goes to grid and filament of the second tube. The filaments of both tubes are joined together as usual, so there is but one central connection

On the output side the primary is the double winding. One half goes to plate and B battery of the one tube and the other half goes to plate and B battery of the other tube. Both tubes have the same B battery, as usual, so there is only one central point needed here.

Two steps of push-pull follow exactly the same arrangement, but, of course, the middle transformer must have both primary and secondary double windings.

Push-pull amplification does not of itself give any increase in volume over what a similar number of single tube stages would give. Higher B voltages may be used, however, but no higher than the tubes individually are rated for. That is, the tubes being in parallel, must not exceed their B voltage rating, but, also being in parallel, they are not overloaded by using the maximum. The drain on the B battery is twice as great. There is no reason why distortion is any less than with single transformer coupling, except that there is less liability of the tubes clogging up. Any advantage is in tube action. The transformer action is probably not as advantageous. It is almost

News of New Developments From New York's Radio Shows

Many Changes and Some New Inventions Will Be Found Among the Wireless Apparatus on Exhibit This Year

A New Vernier Dial

The Town Crier Speaker

Company of this city. The speaker is ruination of the tube. molded in one piece. The distance the signals after being amplified by special arrangements were necessary outlet of the speaker in an even overheating, so that 3,000 volts is recof the speaker is 12% inches, the bell use. being ten inches in diameter.

New Products on Display unique features, vacuum tubes and all the needs of the amateurs. several other radio devices. These are to be manufactured by the Radio Telephone and Telegraph Corporation of this city.

A New Five-Tube Receiver The most interesting portion of the plate glass panel and cabinet.

exhibit of the Jewett Radio and Phonograph Company at the Radio with resistance-coupled amplification. World's Fair will be the receiving set The set employs six tubes in all. It which this company introduces this also is mounted on a polished mahogseason. It is a five-tube receiver.

a clear tonal quality and accurate reproduction of the best programs. Its wave length band covers a spread of holding it in place. Battery connecfrom 125 to 800 meters, selective tions to the receiver are all contained tions and within 25 kilocycles of corthe rear. The set is manufactured by rectly tuned local stations. There the sherman Radio Manufacturing are two models—the table and the Corporation of New York City. console. The latter is a self-contained unit with the loud speaker

The First Portable

An interesting exhibit at the Radio pioneer developments of J. M. Stone, of tuned radio frequency that empresident of the Operadio Corpora- ploys the "potential balance circuit" tion, manufacturers of self-contained for suppressing oscillation is to be radio sets. The first portable radio presented to the listening public in set and one of the old horseless the form of an unusual receiving set carriages, both of which were used by -the Valleytone. It is said that, Mr. Stone in 1909, will be shown due to the potential balance control along with the latest developments stations a few meters apart can be of his organization. That the antique brought in as clearly and distinctly radio, which will be displayed, was as if they were 200 meters apart in even the portable radio receiver, howl has been reduced to a minimum. to be a development of the last two years, has gone through quite the tial balance method. same degree of development as the automobile.

A Tube Tester

One of the newest devices on exhibit at the Grand Central Radio Exposition is the Superadioe Dynometer, for measuring the power of L-3 receiver. vacuum tubes. Visitors to the exposition are invited to bring all their the new Ultradyne, which is on distubes to the place where the instru- play this week, is the control system. ment is on display and have them There are no knobs or dials, but

be tested by any one who has not tion he wishes. had any previous experience with the Just below the grill and to the

A New Power Tube

covering the best part of two years, circuit is opened, thus cutting off the the De Forest Radio Company announced the perfection of their new type "H" transmitting tube for amateur use. In the development and of the grill. The loud speaker is disdesign of this new tube the engineering staff considered first and foremost the exact needs of the amateurs who would use the tube.

In order to make the tube operate A new dial, known as the "Verni- at all wave lengths efficiently it was Juster," has recently been announced necessary to reduce the capacity beby the Brooklyn Metal Stamping Cor- tween grid and plate to only that poration. The dial is insulated from which existed between these elethe shaft of the instrument it is to be ments, thus practically removing all used in connection with, and is said capacities between leads and other to have no hand capacity, due to its portions of the tube structure. For being constructed of metal. It has a that reason the tube has a cross-like gear ratio of 15 to 1 and is calibrated structure and appearance, all leads from 0 to 100, covering 180 degrees. being actually separated. In the "H" The dials are made with both clock- tube there is no place where leads wise and counter-clockwise calibra- carrying high voltages are in proximity to one another, which would cause capacitative effects. Its construction is also such that voltage surges to The "Town Crier," a new loud which the tube may be subjected speaker of unique design, is now cannot cause breakage of glass parts. being exhibited by the Pioneer Sales with consequent loss of vacuum and

The tube will oscillate on all plate from the unit to the outlet of the voltages from 750 to 5,000. While the speaker is approximately twenty-one tube has actually been used in an osinches. The channel through which cillating circuit employing 5,000 volts. the receiving set flow rises to the to prevent the tube from seriously gradual column. The over all height ommended as the limit for general

The tube fully meets the requirements of the amateur field of to-day, especially those interested in the The new line of the Kismet radio ultra-low wave work, notalone for products will be on display at the its rugged construction but for its Radio World's Fair this week. The power to stand up under heavy loads. new apparatus includes a five-tube Furthermore, its range of power and radio frequency receiver with some wave length is such that it will meet

> Glass Inclosed Receiver The radio receiver known as the 'Clarified de Luxe" is one of unique design. The working parts are entirely inclosed in a polished French

The circuit is tuned radio frequency any base with polished nickel finish-The set has been designed to yield ings and special straight-line condensers. The plate glass top is so arranged that it may be removed

A Potential Balance Circuit What is claimed to be an entirely new innovation in radio manufacturing will be released for public in spection at the Radio World's Fair World's Fair will be that of the this week. A new controlled method first shown in the days of the horse- wave length. The tendency of conless carriages, is the best proof that ventional receivers to squeal and which has been considered by many according to V. H. Laughter, who

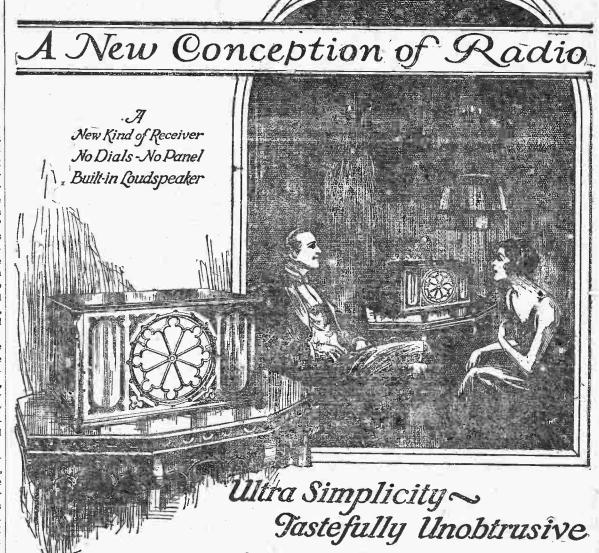
> The New Model L-3 Ultradyne The present tendency in the design of radio receiving sets is toward simplicity, relative to operation, and artistic lines. This together with much originality is displayed in the design of the new Ultradyne Model One of the novel characteristics of

rather two levers with small handles The instrument is manufactured by on their ends which run parallel to the De Witt La France Company, of the periphery of the circular grill in Cambridge, Mass. It is said that it the center of the cabinet front upon tells whether the tube under test which is moulded two scales with is a good amplifier or detector and degree markings. These are the only how good. It also enables tubes to variable elements requiring adjustbe matched and measures accurately ment when selecting a station. All their performance without calcula- one has to do is move them upward tion. Three tubes a minute may or downward until he hears the sta-

right of it is a small knob, which controls the output volume of the loud speaker. When the knob is After considerable experimenting, turned full to the left the A battery vacuum tubes.

Head phones can be used by employing the jack mounted to the left phone plug is inserted

made of five-ply mahogany veneer



The Ultradyne Receiver is worthy of the place of honor in luxurious

piece that makes the entrance of

unobtrusive. inconspicuous. It rep-

resents the triumph of art over

ally at your instant command.

The Ultradyne, Model L-3, sup-plants the usual "laboratory ma-chine." It is a new artistic table-The Ultradyne Model L-3, fulfills everything that the critically-minded have demanded of radio. Why wait any longer, why deny yourself the infinite treasures of radio?

> Skepticism will vanish if you will let your local dealer demonstrate this new modern radio receiver.

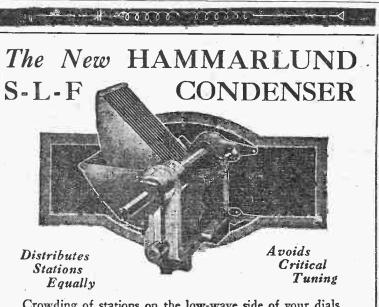
Illustrated folder on request. PHENIX RADIO CORPORATION, 114-116 EAST 25th ST., NEW YORK

THIS new kind of radio-musical instrument

marks the mastery of technicalities to the point

where the whole range of radio's resources are liter-

First Showing: RADIO WORLD'S FAIR At the Armory—Booth 37, Section B



Crowding of stations on the low-wave side of your dials is entirely avoided by the new Hammarlund Straight-Line-Frequency Condenser.

The new Hammarlund is a mechanical and electrical masterpiece, containing all of the features that have won world renown for Hammarlund workmanship, plus several new ones, representing the perfections of advanced engineering.

Examine Hammarlund Precision Condensers and Coils at the Radio Show, Grand Central Palace. Space 24, Hammarlund Manufacturing Company. 424-438 West 33rd Street, New York.





BRACH **SHOCK-PROOF** RADIO PLUGS -Perfect Contact -Clearer Reception

Have you ever LOST A STATION you wanted to get?

Have you? Perhaps it just naturally faded away. Perhaps some nearby powerful set stole its distant thunder. Don't blame the weather or your receiver entirely. It can't do its best on weak batteries. Keep those storage batteries live with the Ful-Wave Charger. So convenient—no renewing of bulbs, no water or acids, no attention.

Ful-Wave Chargers are the most efficient

Ful-Wave cannot overheat. They are

Ful-Wave Chargers are factory sealed. Type "A-B" will charge "A" and "B" stor-

age batteries simultaneously. Type "A," operating at almost twice the speed, charges "A" storage batteries in record



For Charging "A" Batteries in Jig Time



If I am to keep this radio I want to say how much we appreciate it. We never hear or see anything of the world out here, only through the For Charging "A" and "B" Batteries Simultaneously

is a double joy to me, as with my

blindness I am fighting against a

such a wonderful gift. It is big work,

and I am sure all interested in help-

ing make life a joy to us will be re-

tude enough for dear Miss Rhoades sending you my name and to have

serious illness.

ew world to me.

my chair caning.

It has been installed and the results

have been fine. My heart is full of

gratitude toward you, who have pro-

vided this pleasure for us. The radio

was installed by a regular radio man,

who says that the instrument is be-

It was made possible to supply so

many blind people with sets through

The accessory manufacturers who

yond all question a fine one.

LIBERTY ELECTRIC CORPORATION of New York

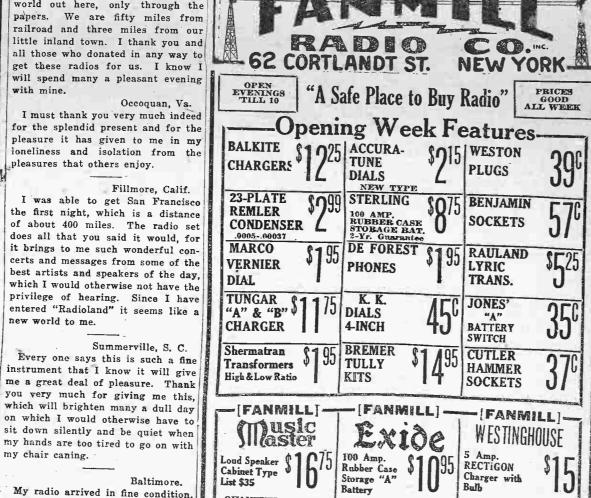
ON EXHIBIT AT BOTH RADIO SHOWS

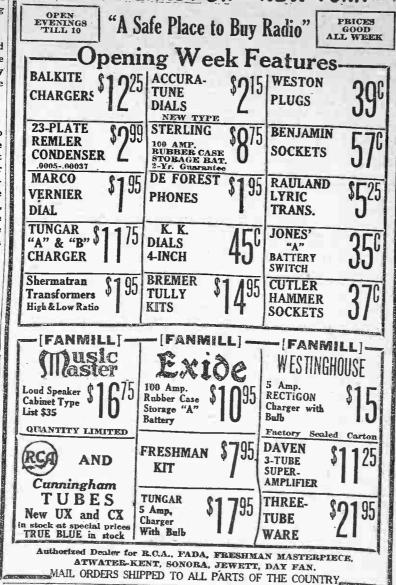
258TH FIELD ARTILLERY ARMORY GRAND CENTRAL PALACE

ALL FIRST-CLASS DEALERS









258 FIELD ARTILLERY ARMORY BOOTH L-SECTION F.

IMPORTANT RADIO ANNOUNCEMENT

WATCH for grand opening of our new store this week Send postal for list of more than 100 important radio items reduced in price for our opening week.

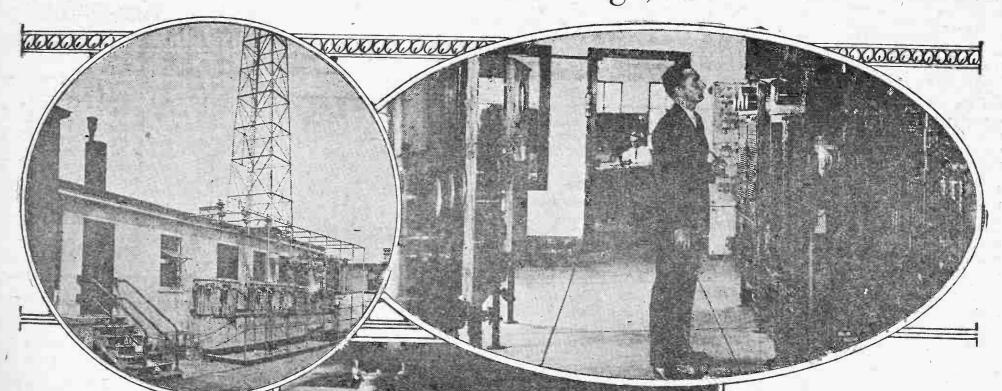
Special mail order department. Mail orders filled promptly.

Times Radio Corporation

159 Greenwich Street (near Cortlandt Street) New York City mication to Department C for immediate attentio fifteen minute "Devotional Period."

Popular American Broadcasting Stations

No. 9—KYW, Chicago, Ill.



External view of KYW showing the transformer equipment and the base of one of the antenna supports

ADIO broadcasting came into being in the West on Armistice Day, November 11, 1921, with the opening at Chicago of the Westinghouse Station KYW. Broadcasting was already known in the East, as a result of the work of KDKA, at Pittsburgh, which had been opened a year before KYW first went on

On that memorable occasion when KYW's voice was first heard, there appeared on the program two of the leading ertists of the United States, Mary Garden, who gave a short talk, and Edith Mason, who sang two selections. The program required in all not more than half an hour, which stands in marked contrast to the twenty-four-hour service now given by the station.

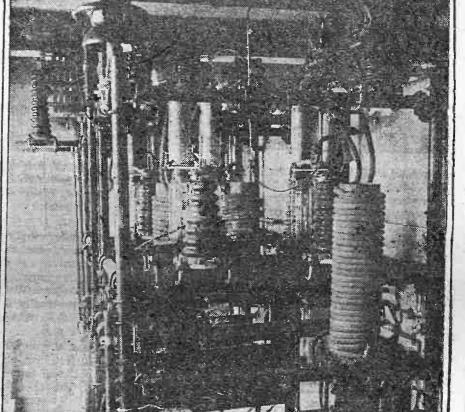
In its three years of existence KYW has grown rapidly. From a station that required only three or four in its personnel, it has been expanded until today there are more than thirty men and women on the staff, and from a series of programs covering only a short period daily 'the station now broadcasts almost seventy-two hours a week, which is equivalent to an average of over ten hours' daily broadcast. This covers a period of twenty-four hours a day, seven days a week, during which time almost all phases of human interest are embraced.

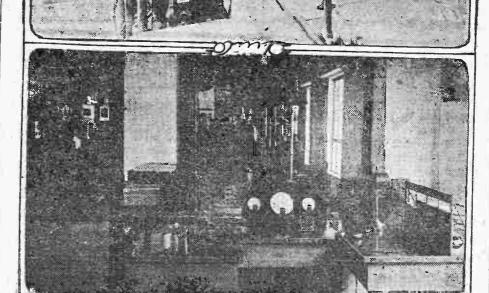
Four Years of Service Armistice Day, Nover

ber 11, 1925, will close KYW's fourth year of amazing changes and growth. From its first broadcast, which went out from the stage of the auditorium, the station now enjoys the use of two large studios-one in the Congress Hotel, a palatial up-to-theminute type of studio constructed with acoustics conducive to the best broadcasting, and another studio, located in the "Chicago Evening American" Building. The new station on the roof of the Congress Hotel is a sister station to KDKA, East Pittsburgh, and represents the peak of radio ingenuity, including equipment of the finest construction. The new station which was recently put into service, replaces the good old KYW on the roof of the Edison Building, which for almost four years furnished radio fans with pro-

In order that we may obtain an accurate impression of the extensive service given by KYW, let us glance through one day's broadcasting. During the twenty-four-hour daily broadcast will be found the morning exercises given daily at 7 a. m. to 7:30 a. m. Immediately following the exercises is broadcast the

Mrs. Anna J. Peterson favors the housewives with her daily "Table Talks," a feature that has become paramount in importance in KYW's service.





Above: Rear view of the broadcasting apparatus with the modulator panel in the foreground. Below: Looking through the window from the operator's desk

A visit to the studio on Tuesday, Thursday and Saturday afternoons, from 2:30 to 4 o'clock, would bring you there just in time to hear the Frolics, which are composed of popular song and instrumental selections from the local stage. Tuesday and Thursday evenings, from 10 to 11:30, from this same studio are broadcast the "Evening at Home" shows, composed largely of staff talent. From this studio comes the "Midnight Revue" broadcast every Wednesday and Friday night.

The programs formerly broadcast from the Edison Studio are now being given from the new Congress Studio. On Saturday evenings at 9:30 a classical program is presented from the Congress, including the very best known artists of this coun-

Midnight each Saturday jumps into the limelight with a snappy popular program, selected from the best talent. This is known as the Congress Carnival.

A pioneer feature of the station is its bedtime stories. Surely Uncle Bob is known in every home. He is that happy gentleman whose more intimate sobriquet is Walter Wilson, and it is he who tells the animal and bird stories to the kiddies each evening, and it is his jovial songs and merry laughter which have become the spice of the children's evenings.

From bedtime stories we travel to "Twenty Minutes of Good Reading"-a feature made famous by the Rev. Claude J. Pernin, S. J., who is well known as the head of the Department of English at Loyola University.

The power room and the control room in the background. From left to right are shown the rectifier and modulator

In seeking radio service for everybody there looms up a very important type of broadcast; the farmer requires close attention, and in that pursuit KYW again is seen as the forerunner of what is now a very active field. Several years ago the station, in co-operation with the American Farm Bureau Federation, instigated the Farm Radio Service, which to-day is one of the station's outstanding features.

During the winter months the "Insomnia Club" presents lively syncopation. The Coon & Sanders Original Nighthawks, of radio fame, have been well named. Going on the ether at 1 a. m., with a type of playing unique and frivolous, they have kept so many people out of bed that some one suggested the cognomen "Insomnia Club," which explains the origin of that name. They have been heard all over the country and have ardent supporters in far-off Apia, Samoa, whence letters are received telling about the opportune "dinner" music they are furnishing, the refrains being tuned in at about 7 o'clock in the evening in Apia.

All these features and many others have been developed under the supervision of Wilson Wetherbee, director of the station. Having come with KYW during its infancy, he has witnessed the changes as they took place, playing an important part therein. The building up of the program activity is directly attributable to

KYW became the first station to have newspaper affiliation, and the radio news service became the pioneer radio herald, and William J. Clark was the first editor.

Engineering Staff.

Some cf the foregoing explains the reason for needing a crew of more than thirty men and women. Walter Evans, KYW's first and present chief engineer, has increased his staff of engineers and operators, until to-day he has under him a capable, well-trained crew, who attend to all the outside pick-ups and studio broadcasting. Mr. Evans's reputation as an expert radio engineer is well known. Having a natural lust to study radio when a boy, he soon entered into that class, limited in number, who really knew something about it. With America's advent into the recent war, Mr. Evans joined the service in that capacity and served the government on land and sea. After the armistice in 1918, he joined the station's ranks and was given charge of KYW when it was decided to build that station

Selection of Artists

There is still another angle that enters into the production of good programs. Artists must peculiarly lend themselves to that kind of entertainment. Voice is one of the big considerations, personality is another, and so forth. In selecting suitable artists and choosing their repertoire, Morgan Eastman, who is musical director of the station, is found to be a very valu-

(Continued on page eight)

Popular American Broadcasting Stations

The principal considerations striven for in the design of the new installation were perfection of quality, reliability and reserve power. The resources and best engineering skill have gone into the new equipment in order that the vocal solo or complex orchestration may be turned over to a discriminating public, identical with the original sound. Years of experience in the design of electrical apparatus is apparent in the well arranged panels, the easily accessible units with everything in duplicate so that program interruption due to electrical causes may be reduced to an absolute minimum.

Considerable more power is provided for than will ever, in all probability, be needed for ordinary broadcasting. This is a desirable feature, for it is a better operating proposition to run a large piece of electrical equipment at a fraction of its capacity than to overload a small installation. This will leave a large margin of reserve power in case of national emergencies, paralysis of telegraph and telephone lines or similar contingencies.

To obtain a working idea of this leviathan of the radio field we will begin with the primary source of power and follow it through to the antenna.

Power Supply Apparatus

Current at 4.400 volts is obtained from the local public service company over two separate transmission lines from different generating stations. This gives 100 per cent insurance against power line interruptions. A 100 kilowatt transformer substation has been built in the basement of the hotel where the transmission lines are stepped down to 220 volts and carried through large capacity cables to the radio station on the roof. These are connected with a power distribution board or feeder panel through which all of the different pieces of apparatus draw their source of power. This panel also carries suitable cut-outs to open the circuits and shuts off the current should accidents occur to the different machines.

Next in line is the contactor panel which does the thinking for the set (and, if necessary, for the operator). It is so arranged that the operator need only press one small push button and in slightly over ten seconds the whole station is under way. The push button first energizes the water pump which forces a stream of cold water through the jackets of the tubes. When the water pressure comes up to a predetermined value it allows the next contactor to operate which starts up the filament motor generator units. As the generators reach their full voltage, relays in the filament lines make contact, the next circuit breaker does its bit and the 60 cycle rectifier for the grid bias,

and another small rectifier for the plates | cooled modulator tubes and to two waterof the fifty watt amplifier tubes, add their energy to the circuit. If everything to this point has taken place to the satisfaction of the control panel, it allows the large contractor to close, and current is furnished to the bank of 22,000 volt trans- | Hartley oscillating circuit is used and the

cooled oscillators. The oscillators work directly into a "tank" circuit which determines and holds the wave length constant, and which is impedance coupled to the antenna. A development of the formers outside the station room. Should | modulators work on the Heising prin-



The personnel of KYW. Top: John Michaels, operator; Fred Belsing, electrician. Middle: L. S. Fisk, operator; C. W. Sheets, operator; Chas. C. Hines, operator; H. J. Pomy, electrician. Bottom: H. E. Randol, operator; Fred A. Hill, operator; Walter C. Evens, chief engineer; E. H. Gagr, operator; D. A. Meyer, chief operator.

anything be amiss while this procedure | ciple. The impedance or choke coupling is going on the contactor will remove the offending apparatus from the circuit and start over again.

The four 10 kilowatt, 22,000-volt transformers outside the station are connected with the two transformers in parallel on each phase and the output is connected to four water-cooled kenetron rectifier tubes, which give full wave rectification on two phases, with a resulting pure direct current at voltages up to 10,000. The output of the rectifiers passes through a bank of high voltage choke coils and condensers which smooth out the direct current until it is free from the slightest traces of

between the tank and the antenna circuits is considerable of an advantage to the radio listeners, because it secures extremely loose coupling of the transmitter and the choke eliminates practically all energy in the harmonics, which have been a source of trouble in the past.

The antenna is composed of two 31/2inch horizontal cages, 140 feet long, and supported by two 125-foot steel towers. The down leads are two similar cages and connect the antenna to an open circuit tuning inductance near the base of the south tower. The counterpoise is a 10 wire fan, radiating from the south around the hotel roof. More than a mile

and three-fourths of hard drawn copper wire went into the construction of the antenna system.

Two cables, each containing fifty pairs of telephone wires, connect the new KYW station with the several studios and the numerous outside points from which programs are broadcast. The cables terminate on a large telephone test board, through which telephone lines may be balanced and equalized to pass all the complex voice and musical frequencies from 50 to 6,000 cycles. Provision is made on this board for setting up phantom and simplex circuits over any line, so that studio equipment may be remotely controlled and adjusted from the station. The telephone test board is connected through plug and jack arrangement to a smaller board on the operating desk, only the circuits to be used that day coming in on the operator's board. By means of this small switchboard he is able to change from one studio to another, talk to any studio or connect back the output of one studio into another so the waiting artists there may hear the program.

Control Apparatus

A small, well arranged control desk starts, stops and adjusts the entire station as well as handles the programs coming in over the telephone lines. The operator need not leave his chair to test any part of the equipment or to take care of any of the manifold details incidental to the operation of a broadcasting station.

A bank of amplifiers or repeaters within easy reach of the operator passes the incoming voice current through tubes progressing from a few watts in the first stage to four fifty-watt tubes in the last stage. The volume of the voice current is many times multiplied in this manner until it reaches a value sufficient to actuate the four water-cooled modulator tubes.

One of the unique features of the station is in the fact that there are only two moving parts, the circulating pump and the filament generators. Power for every other use, from the giant power tubes to the smallest amplifier, being secured through the rectification of sixty-cycle alternating current.

There has been no expense spared to make it possible for the new KYW to uphold the traditional reliability of the station. Every facility for servicing and repairing the equipment has been built into the new plant, including a completely equipped machine shop.

KYW is now on an equal basis with her older sisters, KDKA and WBZ, and is prepared to put a consistent signal of the highest quality into the homes of the tower to points equally distant, entirely Middle Western listeners-in throughout

Fourth Annual National Radio Exposition Opened Yesterday Afternoon Following is the official program of the

signed for AC lighting mains, will attract a large amount of technical and popular attention. Intensive research, it is said, has developed the fact that the employment of a powerful amplifying tube in the last audio stage will result in revolutionary improvement in volume and in the quality of reproduction.

Other tubes, designed in some cases for storage battery operation and in other cases for dry battery use, will result in a remarkable improvement in reception this, year, it is claimed.

Sets that operate directly off lighting circuits; single controlled sets; new and improved styles of battery eliminators; new principles of battery construction, are among other features that will be shown at the exhibition.

Radio amateurs throughout the United States are taking great interest in the contests to be staged at the exposition. Because of the extraordinary scope and diversity of the contests this year, the more important amateur contests will be conducted under the auspices of the Second District Executive Radio Council, which includes in its membership all the chief amateur radio clubs in the second radio district. A committee of the most prominent radio amateurs in the United States will be appointed by the council to act as judges.

Silver cups, radio sets and hundreds of dollars in cash prizes will be distributed to the contestants.

Leading radio manufacturers, broadcasting stations and amateur clubs are taking an active part in promoting these events. Manufacturers are contributing to the fund for prizes and broadcasting stations

of the contests.

will co-operate by announcing the details | broadcast from Grand Central Palace from special studios erected there by the The value placed by the radio industry | leading broadcasting stations of the upon the resource and ingenuity of the country. Famous announcers, leading American radio amateur, is evidenced by radio entertainers, prominent theatrical the fact that three prizes are being offered | stars will appear in person. New features this year for best home-made receiving | will be presented in the radio program sets. Any type of circuit may be entered. and there will be a constant round of en-Throughout exposition week an extraor- tertainment from the radio theater erected dinary program of entertainment will be on the third floor of Grand Central Palace.

The Second Radio World's Fair

(Continued from page three)

to the visitors.

They have arranged special nights for the public and the trade. Wednesday will be "New York Night," at which Mayor Hylan is to be guest of honor: Thursday Bronx Night, with Borough President Henry Bruckner as presiding officer; Friday, Queens Night, with President Maurice Connolly, and Saturday Brooklyn Night, with President Joseph Guider. Monday and Tuesday Manhattan and Richmond will be especially featured, with their borough officials and leading resi-

On Tuesday night, it is expected, Senator James J. Walker will officiate at an interesting ceremony, presenting a cup to Thornton Fisher, cartoonist and sports announcer, on behalf of his friends in the athletic world.

a big staff of men and women, who will be | take place on Wednesday, when Arthur H. on hand each afternoon and evening to Lynch, director of the international tests, extend courtesies and to give information | will be given a trophy celebrating his contribution to radio development.

"The Happiness Boys," Ernest Jones and Billy Hare, and other famous radio stars also will come in for special honors, part of a long sequence of popular events.

Another feature of the exposition will be the reception of messages from the MacMillan expedition, together with the presentation of a silver cup to the wireless operator who heard most messages from the scientist and explorer, the National Geographic Society and the American Radio League co-operating with the Radio World's Fair in this award.

The management has installed directional signs on the Grand Concourse and other places to aid meterists in reaching the 258th Field Artillery Armory, where there is splendid parking space, as known to those who attended the Automobile Another presentation of importance will | Show held there last year.

fourth annual National Radio Exposition: SATURDAY, SEPTEMBER 12

P. M.

12—Exposition and fair formally opened.

2:30-3:30—Radio Fashion Show.

6:30—Greeting to America by the Duke of
Sutherland by radio-telegraph and broadcasting from England.

3:30-9:30—Radio Fashion Show.

10—Address by Secretary Hoover.

10—Address by Secretary Hoover.

MONDAY, SEPTEMBER 14

1-2—Radio jobbers' forum.
2:30-3:30—Radio Fashion Show.
7:30-8:30—First demonstration of television by the radio transmission of a speech and photograph of speaker simultaneously, Grand Central Palace.
8:30-9:30—Radio Fashion Show.
9-11—Reception to prominent announcers, radio and stage stars.

TUESDAY SEPTEMBER 18

and stage stars.

TUESDAY, SEPTEMBER 15

1-2—Radio jobbers' forum.
2:30-3:30—Radio Fashion Show.
3-4—Radio dealers' conference.
7:30—World roll call by radio, demonstrating phenomenal record in world communication by wireless.
7-30-8:30—Entertainment by leading announcers and radio stars.
8:80-9:30—Radio Fashion Show.
9:30-11—General entertainment from Radio Theater.

WEDNESDAY SEPTEMBER 16

WEDNESDAY, SEPTEMBER 16

WEDNESDAY, SEPTEMBER 16

1-2-Radio jobbers' forum,

2:30-3:30-Radio Fashion Show.

3-4-Radio dealers' conference.

7:30-8:30-Radio pageant, showing prominent stage stars and artists' models, demonstrating the service of radio to the home.

8:30-0:30-Radio Fashion Show.

Theater, THURSDAY, SEPTEMBER 17 -2:30—Radio jobbers' forum,

THURSDAY, SEPTEMBER 17

1-2:30—Radio jobbers' forum,

2:30-3:50—Radio Fashion Show,

3-4—Radio dealers' conference,

7:30-8—American Woman's Association, Address by Miss Gerirude Robinson Smith, president, Songs by Marie Dressier and Misa Vaughn de Leath, the original "Radio Girl."

8:30-9:30—Radio Fashion Show,

9:30-11—Address from Radio Theater.

FRIDAP, SEPTEMBER 18

1-2:30—Radio jobbers' forum,

2:30-3:30—Radio Fashion Show,

3-4—Radio dealers' conference,

7:30-10—Velce recognition contest; speed receiving contest; freak set building contest.

8:30-9:30—Radio Fashion Show,

9:30-11—Entertainment from Radio Theater.

SATURDAY, SEPTEMBER 19

1-9:30—Radio jobbers' forum,

8:30-9:30—Radio fashion Show,

8:30-9:30—Radio Fashion Show,

SATUMDAY, DEFIGURE 15
1-9:30-Radio jobbers' forum,
1:30-3:30-Radio Fashion Show,
9-4-Radio dealers' conference,
4:30-0-Prize awards,
8:30-9:30-Radio Fashion Show,
9:30-11-General entertainment in Radio Theater,

The Herald Tribune Radio Fund Brings Joy to Blind

Approximately 2,000 Wireless Sets Have Been Installed in the Homes of the Needy Blind With Money Contributed by Readers

OES Mr. Madden live here?", sets was completed, so as to be able a boyish voice asked as to render a comprehensive report of a stream of light poured through the open door, revealing fund.

Four sets were selected on the three Boy Scouts in uniform. "Yes, basis of efficiency, tone quality and you will find him on the third floor." ease of operation. These four sets

Three pairs of hands simultaneZiegler Magazine for the Blind" and the blind girls who were employed ously lifted heavy packages from the there cast the deciding vote for the floor of the rickety porch, and one machine which most adequately met by one they filed through the door their idea of the ideal machine for and up the battered stairway. the blind.

Reaching the top, they were conmachine which had been unanimously fronted by an open doorway leading given first place by the advisory cominto a dark room. Timidly they nittee and their technical advisers. approached the door and inquiringly This was the Paragon two-tube set said, "Mr. Madden?" "Yes, come in. for dry cell use, with UV-199 tubes, Who is it?"

"We are Boy Scouts who have come Company, of Upper Montclair, N. J. to install a radio set that has been given you by the American Foundation for the Blind." "Me, a radio set? first made throughout the country to There must be some mistake."

The leader smiled and said, "No, ports indicated such complete satisthere is no mistake. We have full faction that an order was placed to instructions here and your name and the limit of the fund. address, and the set is for you, all Approximately 2,000 installations have been made and the letters from

In his eagerness the blind man fell the recipients of these sets are so over the chair that stood between joyous, thankful and enthusiastic him and the light, which as it blazed that they constitute one of the up revealed a room entirely devoid brightest pages in the history of this of any cheerful aspect. A single iron newspaper. bed with grimy spread, a washstand, In order that you may have your a chiffonier and two chairs completed proper share of the joy that has been the furnishings, all of which were brought to these unfortunates of poor quality and battered where through your generosity we are quotchairs had struck when tipped over ing from some of these letters: by the sightless man in his journeyings about the room.

serted and part of a coil of wire dropped out of the window for an antenna. The ground wire was then attached and the switch pushed in to light the tubes. "To-morrow we

the Scouts slipped on the head phones, gave the single dial of the set a twist, then, as music flooded set a twist, then, as music flooded And find a restful seat.

Across the air at high.

When weary of my daily tasks, I long for something sweet; I turn its dial just a bit And find a restful seat. in, stepped back and adjusted the phones to the ears of the blind man.

With tears streaming from his will the tears streaming from his will the tears of the blind man. With chords so deep and long.

with tears streaming from a with trembling hands, removed the phones from his head, and, turning phones from his head, and, turning the with the wi how it would be possible for me to thank you for your kindness in coming here to install this set. Words

To bring them through the sllent night, From South and East and West; From Canada. up in the North, Scarce knowing which is best. ing here to install this set. Words could not tell how much I appreciate Aladdin's lamp could not compare what the American Foundation for the Blind has done, and certainly I That plays all kinds of instruments; That laughs and sings and talks. never could thank the New York Herald Tribune for collecting the fund and the readers who so generously

It brings to me the master minds, The artists of renown, And makes a great metropolis Of this small, quiet town. gave to the radio fund for the blind.
All I can do is to say, with Tiny
Tim, 'God bless and keep you, every

MyRTIE ANNA ALDRICH.

The little non nicture given show is a true recital of what has been re- Mr. Rice attended one of our social

Blind by the Herald Tribune readers. poor to buy even the daily or weekly The Herald Tribune has waited until newspapers, and his sources of innow, when the installation of these formation are limited to the occa-

West Burke, Vt.

which is made by the Adams Morgan

100 Test Installations

insure uniform operation, and the re-

One hundred test installations were

I cannot find words to tell you just A few deft strokes of a knife blade, what this new friend of mine is going the packages were laid open, the to mean to me in the days to come, radio set lifted from its shipping but the inclosed verses may give you case, batteries wiped off and set in some idea of my grateful appreciaplace, phones plugged in, tubes in-tion of all the care and trouble that

will rig up the antenna right," the boys said.

With practiced ease the leader of Across the air at night.

MY RADIO
I have a little wonder box,
A marvel of delight,
That brings the choicest things to me Across the air at night.

peated, with varying details, about functions yesterday afternoon and 2,000 times throughout the country. asked that 1 write you his word of All this has been made possible thanks and appreciation for the outthrough the money so generously con- fit. This man lives ten miles from tributed to the Radio Fund for the the city on a small farm, and is too



Fleetwood Ward, an Indian scout with Custer in the Wild West in '69, is shown tuning in on his radio set, recently installed by local Boy Scouts, Mr. Ward is blind, The radio set is the gift of the New York Herald Tribune's Radio Fund for the Blind,

Acoll In Hall were then taken to "The Matilda

"WJZ" and "WJY" Broadcasting Headquarters for The Radio Corporation of America

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WESTERN ELECTRIC Phones.....\$5.25 FEDERAL 65-65A Transformers....SAMSON 3-1 and 6-1 RATIO Transformer.... MARCO DIALS.....
DUBILIER RADIO FREQUENCY.... Do Forest, R. C. A., Cunningham, Daven, Schickerling NEW DAY FAN, CROSLEY AND DAVID GRIMES \$30 Atlas Horn....\$9.95 FAMOUS JOURNAL 1-tube Set......\$2.49

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Sale.

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AT LOWEST PRICES. For the Public's Convenience we have established a SPE-CIAL STORE, at 78-A Cortlandt St., two doors below our regular store, which is devoted entirely and exclusively to

No Parts carried in this SET STORE, in order to be able give you the best and most courteous attention. Expert Mechanics are always at your Service!!

Radio for Railroad Communication

(Continued from page eighteen)

ystem. Mr. Boddie early appreciated he fact that a successful system nust combine the ordinary automatic elephone system and the carrier curent system, as it was known at that time, and bring them into a harmoni-

Now, those of you who are familiar with automatic telephony appreciate that it is a very complex art and you likewise appreciate the complexity of the radio art. To bring those two developments into complete harmony, so that they will work reliably day in and day out was a decided accom-

The Westinghouse company in the states has perfected an automatic system of carrier current communicaion applicable to practically any system of electrical conductors, and I hall describe it in detail, as it will doubtless find many uses on electrical

Description of Wired Wireless You have, as you have in radio, a transmitter and a receiver. However, the antenna to which these parts are connected, instead of being suspended in the air, is suspended in close proximity to a high tension line or to a trolley wire. It is found that when the antennæ are thus suspended the waves, instead of radiating off into space, follow these wires. They can be picked up therefore by suitable receivers that have their antennæ likewise suspended in close proximity to the same elevated wire. There is no tuning done either at the receiver or transmitter. The adjustnents are all made when the instrument is installed, and the operator merely talks as one would talk over a wire telephone. In order to obtain duplex communication; that is, in order to be able to talk from station No. 1 to station No. 2 at the same time that station No. 2 talks to station No. 1, two different frequencies are used. For example, transmitter 1 is adjusted to 60,000 cycles per second, and the receiver 1 to 50,000. This transmitter works with receiver No. 2 and transmitter No. 2 with receiver No. 1. You will note that the frequencies that are used are of the same order of magnitude as are the frequencies used in space radio communication.

A carrier current transmitter is very similar to a radio transmitter. It utilizes the same kind of vacuum tubes and much of the other apparatus is very similar. The main difference between this and the pure radio equipment is the frequency at which it operates. It, of course, has many automatic features not found in radio transmitters, but the basic features are the same. The transmitter is only in use during the talking operation. When the operator takes the telephone off the hook switch all tubes are connected to the source of power.

Carrier Current Receiver

The carrier current receiver imilar electrically to the radio receiver-used on shipboard, but in contradistinction to such receivers, carrier current receivers are all adusted and locked when the equip ment is installed. No adjustment is made during operation. The receiver is mounted in a manner similar to switchboard construction and is thus self-supporting.

An electrified railroad can thus utilize its power-carrying conductors or even telegraph wires to guide carrier current impulses and so augment its present wire communication facilities.

In the cases of long freight trains on electrified roads, particularly where there are a large number of curves, it is found that at times the air whistle on a locomotive is insufcient in volume to be heard the length of the train. In other words, if the engineer desires to signal the caboose or a helping locomotive very frequently the signal fails to get back. Many solutions have been suggested to alleviate this difficulty, but none of them has been practical, principally because they would require equipping every car on the entire system, the expense of which would be prohibitive. Finally carrier current signaling was suggested. It was proposed to utilize the trolley wire or third rail as the guiding medium and it would thus be necessary to equip the engines and cabooses only.

I have endeavored to give up very briefly an outline of some of the things that have been done in the way of supplying communicating faties for the railroads.



ONS Radio Products Timmons Radio Products Corporation

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No Batteries Whatever POWEROLA

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Cost of operation less than ½0 per hour, or at 4 hours' dally use, 2c per day, \$7 per year. A 5-tube battery set costs for similar operation from \$75 to \$100 a year, with half-hearted service and reception, with money invested on an obsolete product. Constant, dependable, ever waiting, clean and economical service and reception is yours with Powerola. It is foolproof and fully guaranteed: it means first cost—last cost.

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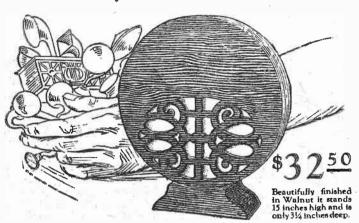
Sir. Thomas Lipton, his crew, his yacht and the radio receiver which the lpeditim win a bout race

to altenda Radio Convention

BUILT LIKE A VIOLIN

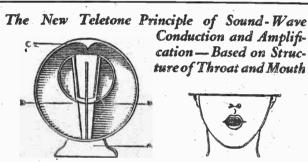
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"Makes Any Receiver Sound Better"



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TELETONE—hear it at any of the dealers' listed below—test it on any receiving set. You'll be amazed at the difference. Teletone reproduces with exact naturalness of tone - a jazz band, with its eccentric instrumentation, a symphony orchestra with its exquisite shading and tonal quality, any instrument, any voice — all with absolute naturalness. This is why-



Refer to the above sectional view of Teletone. Note that a sound-wave coming from the sound producing unit "A" (the human vocal cords) is amplified through the orifice "B" (the human larynx) until it reaches the conducting area "C" (the back of the throat), whence it is again conducted to the point of greatest amplification "D" (the correctly formed and opened mouth of the singer).

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Horan Electric Supply
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Alamac Radio Shop,
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Dreher Radio,
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Riverside Radio Shop,
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West End Radio Co., Inc.
2471 Broadway.

Harlem Radio Exchange,
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Nasan Radio Exchange,
267 West Chen, 267 Third Ave.
Nasan Radio Exchange,
268 Third Ave.
Ave.
408 Tremont Radio Exchange,
267 Third Ave.
Nasan Radio Exchange,
268 Third Ave.
Ave.
4267 Third Ave.
Nasan Radio Exchange,
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Nasan Radio Exchange,
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408 Third Ave.
409 Third Ave.
409

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SERVICE ricating, machining, sawing and ing of Fibre and Celoron (a Bakelite t) specialities and parts. Radio panels 1, rengraved and machined to specificate We can now give service on our new slitter for stripping fibre and thinmetal Gang-slitter for stripping fibre and thin-sheet netal EDGAR 0. OETERS, Dept. H, 206 Lafayette St., (bet. Spring & Broome Sts., N. V. C

AERIAL OUTFITS Each Part A Radio Engineer's Choice. Insure Maximum Results MATEUR **TICKBACKS**

NEW YORK HERALD TRIBUNE RADIO MAGAZINE, SUNDAY, SEPTEMBER 13, 1925

hat every enthusiastic radio amateur begins to become more interested in the radio art than he has during the last summer. The warm days of the summer make it rather hard for the 'brass pounder" to stick at the key and try to communicate with his fellow enthusiasts. The fierce summer static does all in its power to discourage him, and the result is he gradually drifts away from radio and turns toward other sports more

adapted to the summer weather. But now the summer is slowly but surely slipping away—the days are becoming cooler and the static is beginning to fadé away into oblivion as f beat by the oncoming fall and winter. As a result the hand of the amateur begins to itch for the "key" and he longs to hear the "chirp" of the continuous wave transmitter of ome other member of his fraternity n some other state or possibly in some distant land.

With renewed interest he dusts off his old transmitter and cleans the receiver in anticipation of the coming season—the season which every dyedin-the-wool amateur awaits for each

All evidence points toward an excellent year for amateur radio this winter. There are more amateurs operating on the ultra-short wave lengths and the majority of them seem to be good operators. We have noticed during the last few weeks that there is an absence of the "CQ hound" on forty meters. Those who are using this signal are using it correctly.

Foreign amateurs have started to arrange test schedules on 30 meters and less during the daytime for the especial purpose of establishing twoway daylight communication between the two great continents. Undoubtedly the American and European amateur will be communicating while the sun is above the horizon before the ghost of winter has passed. This is something to strive for, and those of us who are fortunate to be home in the daytime should listen for the signals of our foreign cousin in effort to gain communication during the day-

The MacMillan expedition is at last heading for home after having a successful winter as far as radio was concerned. It is said that not a single night passed without some amateur in the United States having communicated with either WNP or WAP. Now that the expedition is homeward bound in all probability there will be an increased amount of traffic bound for various points, all of which will be of great importance to the receiver. Therefore every amateur should strive to maintain constant communication with the Arctic expedition and relay all messages to their destination without the slightest delay.

It seems that the signals of WAP have been more consistent than those of WNP, which is probably due to the better antenna equipment aboard the Perry. WAP is easily distinguished by the peculiar note emitted by the transmitter. It is not a perfect direct current note, but seems to have a ripple and seems to surge when the key is pressed. This expedition has established the dependibility of the short waves and has added another volume to the history of amateur radio.

Word has reached us that the experimental transmitter of the Bureau of Standards, located at Washington and known to the amateur fraternity as NKF, is to transmit time signals on short waves at 6 a. m. daily. The wave length that is to be used is 71.5 meters. Incidentally this will serve as an excellent means for the amateur to calibrate one point in the

80 meter band of his receiver. It is understood these signals are o be transmitted for the especial purpose of the Austrian amateur.

During the past few weeks there has been an absence of amateur signals on the 150-200 meter wave band. There are only a few of the old-time stations using this band and those who are employing its use are seldom heard. In spite of the few stations operating we succeeded in communicating with several ninth district stations and 5ANL the other morning.

We received word from 2BW that he is away on a second vacation, but intends to return soon and rebuild his short wave transmitter. It will probab employ a fifty watt tube.



another leader added to the

Sibley-Pitman Line

A DHERING strictly to its policy of handling the products of only the leading manufacturers in each branch of the electrical industry, SIBLEY-PITMAN now announces that it will sell to the public, through reliable radio dealers, RCA Radiolas, Radiotrons, Radiola Loudspeakers and RCA accessories.

In buying RCA products from radio dealers serviced by SIBLEY-PITMAN your purchase is backed by three dependable organizations - RCA, SIBLEY-PITMAN and the carefully selected radio dealer in your neighborhood.

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Type 59 Receiver List \$177.00.

The receiver comprises one stage of radio detector and two stages of audio frequency amplification with a control which allows the degree of amplification to be varied between wide limits.



List \$105.00. Type 110 radio receiver consists of one stage radio detector and one stage of audio frequency amplifi-cation with a control which allows

the degree of amplification to be varied between wide limits

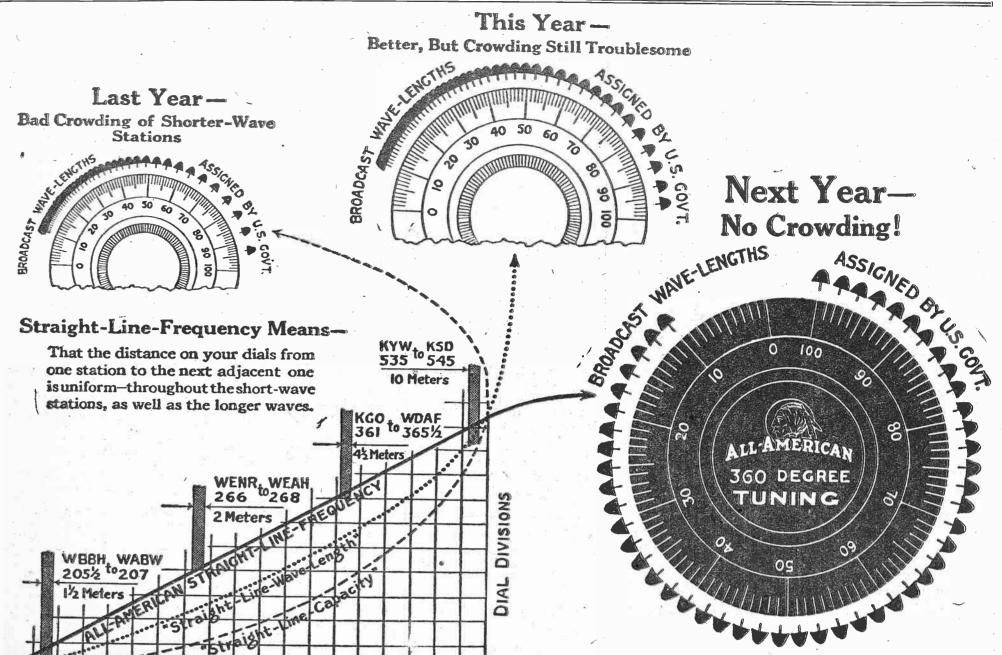


Including in the purchase of either one of these sets, we give ABSOwill LUTELY FREE a \$7 Federal Head Set and an 80c Phone Plug.

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In Original Sealed Factory Cartons.

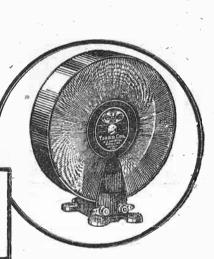
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AILL-AMIERICAN STRAIGHT-LINE-FREQUENCY TUNING

All-American Straight-Line-Frequency Condensers Type C-35 Max. 350 micromicrofarads (Min. 10.5 mmf.)....\$4.50 Type C-50 Max. 500 micromicro-farads (Min. 11.8 mmf.)....5.00

All-American Toroid Coils Type T-1 Antenna Coupler \$3.50 Type T-2 R.F. Transformer 3.50 Set of 3 Coils complete. .º 10.50



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ALTERNATE CHANNELS OMITTED

Ease and certainty in tuning—no more crowding of short-wave stations—no need to buy vernier dials —no gears or other back-lash makers -body capacity absolutely not distinguishable—electrical efficiency unsurpassed—on one-half the panel space: that is the All-American Straight-Line-Frequency Condensers.

WAVE CHANNELS AS ASSIGNED U.S. STATIONS (BY FREQUENCY)

New power for distance reception through close coupling—tuning of arrow-like sharpness—elimination of all oscillation worries through the self-enclosed endless magnetic field -non-radiating reception: that is All-American Toroid Coils - Antenna Coupler and Radio Frequency Transformers. See them at your dealer's.

ALL-AMERICAN RADIO CORPORATION, E. N. Rauland, President, 4201 Belmont Ave., CHICAGO

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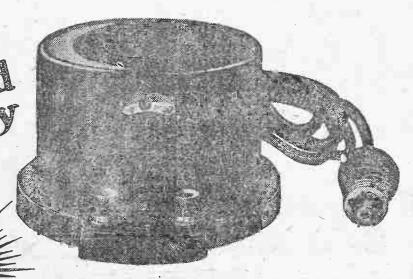
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10 hours §

from Midnight

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Every night thousands of APCO Chargers go to work-when morning comes an equal number of batteries are FULLY CHARGED. Because of its handsome appearance and quiet operation most people keep it by the receiving set, ready to hook-up instantly.

It does its ten hours' work for a nickel!

"A" Battery Charger No. 77, \$18.50

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Eagle Radio Co.

16 Royden Place



Newark, N. J.

The Use of Radio as a Means of Communication for Railroads

G. Y. Allen Urges the Use of Wireless Systems for Emergency Work; Sets May Be Installed at Small Cost; Wired Wireless Suggested

T THE fall meeting of the Canadian Railway Club, which was held at the Windsor Hotel, in Montreal last Tuesday evening G. Y. Allen, assistant to manager, radio department, Westinghouse Electric and Manufacturing Company addressed the members on the subject "How the Railroads Can Use Radio." Abstracts from Mr. Allen's speech are as follows:

Practical Applications

damaged area. No actual tests have

been made of such a system up to the

present time, but doubtless apparatus

In such a system the energy is

entirely dependent on the electrical

continuity of wires themselves. For

completely discontinued for short

distances. The application of such

As this system is comparatively

(Continued on page twenty)

An interesting application of a low

Reliable communication and sig- the sounder is "down" the capacity ofnaling are of paramount importance this condenser is greater than when in the efficient operation of any rail- the sounder is up, and this serves to road. Radio communication's first change the frequency of the emitted wave. The change is extremely appeal is the fact that its continued slight, and width of the wave band performance does not depend upon used for each transmitting station is, the continuity of electric circuits therefore, reduced to a minimum.

far removed from the immediate For a given distance, the cost of jurisdiction of maintenance person- installation of the short wave equipnel. On the other hand, there are ment is perhaps lower than for any certain limitations in the applica- other type of radio equipment. No tion of radio as a means of communi- elaborate towers are required to supcation, and there has rightly been a port the antenna, and the distance great deal of conservatism on the that can be covered per kilowatt of part of all railroads in using this energy is large. new communicating system. I am Either the short wave or long wave not suggesting, therefore, the adop- pure radio system may be used for tion of radio as a system that emergency purposes or for regular will supersede the present systems communication between salient points. in use, but intend rather to It may be further augmented to compoint out some things that have been municate with a moving train. Comdone in this comparatively new field munication with a moving train, howand to outline some of the possibil- ever, is fraught with difficulties, due ities of the future. to the fact that the antenna on board

The development of radio com- the train must necessarily be low to munication for use by railroads in come within the tunnel clearances, the United States, is being actively etc. Such a low antenna forms an pressed by the Telegraph and Tele- efficient receiver, but it is impossible phone Section of the American Rail- to transmit great distances from the way Association, and much of the train. progress there is directly traceable to the co-operative assistance of this organization. They have developed the fact that the most urgent present power radio set has developed in this need of the railroads for radio com- country, due to the severe rainstorms munication lies in the following that sometimes occur in the Middle classes: 1. Spacing radio communi- West. It happens at times that cation of emergency purpose. 2. bridges are washed away or parts of Communication over existing tele- the roadbed are so seriously damaged graph and power wires to increase that trains cannot pass. Generally number of communicating channels. the storm interrupts the communica-3. Communication between front and tion system at the same time, and the rear ends of long freight trains. 4. entire railroad is divided by the area Portable apparatus suitable for at- damaged. The railroads feel that if taching to hand cars or gasoline they had a small emergency radio driven cars to cover moderate distances in an emergency. 5. Short car this emergency equipment could range portable sets that can be car- be brought into play to bridge the

ried by track walkers.

The most obvious application of will be designed for this specific purspace radio communication, is to sup- pose in the near future. plement the present wire communi- A more recent development of the cating system in case of emergen- radio art is shown as the carrier curcies. When wire telegraph or tele- rent communicating system. This phone lines are made inoperative due system uses the same high frequency to storms, stand-by radio telegraph alternating current as does the space or telephone systems can be used to radio communicating system, but, inmaintain the running of trains. Some stead of the energy being radiated of the railroads in the states have from an elevated antenna, it is guided gone to the expense of installing by wires already existing and it equipment for such emergency pur- travels along these wires. The sigposes, and when the emergency has nals are picked off by receivers at arisen, the expense of radio equip- various points along the system. ment has been entirely justified. A nominally powered continuous wave confined to the wires to which it tube transmitter will cover consider- is supplied and interference with able distances, particularly in the other stations is thus greatly rewinter time when storms are most duced. Furthermore, the reliability severe, and consequently when emergency equipment is most needed, degree on the proper maintenance of and in most cases, moderate powered the terminal apparatus and is not torily.

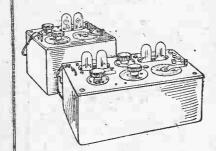
A continuous wave telegraph trans-A continuous wave telegraph trains mitter that has a wide range in wave lengths (600 to 2,500 meters), and which has an output of 500 to 750 watts, will work reliably over a dismostrate with the successful permoter than the successful permoter with the successful permoter than the successful permoter with tance of 500 to 1,500 miles, depend- formance of the system. As a matter ing upon whether it is used during of fact, it has been possible to comthe day or night. The cost of equip- municate through wires that were ment for a station of this power output, exclusive of masts, would be well under \$4 000

a wired wireless system to existing Possibilities of Short Waves wires does not in any way interfere The use of short wave telegraph with their normal use. equipment where licenses can be obtained to use short waves, pre- new, a brief detailed description of it sents a very interesting develop- will doubtless be of interest. ment that the railroads will doubt- About fifteen years ago some preless use. While short waves are sub- liminary experiments were conducted ject to erratic behavior at times, with this new communicating system.

they are sufficiently reliable to war- Instead of sending the energy across rant a thorough investigation. the space, as was done in the space The method of accomplishing the radio system, it was applied to wires. keying operation on our short wave It was found that the energy followed sets is extremely interesting. We those wires substantially and did not simply modify a standard telegraph radiate from them. The advantage, sounder by employing an aluminum of course, was that less power was lever, somewhat longer than the required to cover a given distance standard. On the end of this lever is and that the signals were received mounted an aluminum disc 11/2 inches only at the point to which they were in diameter. If the sounder operates directed. this aluminum disc is moved closer to A Westinghouse engineer, C. A. or farther away from a similar sta- Boddie, is largely responsible for pertionary disc, but is separated there- fecting these early experiments into from by a circular piece of mica. The a practical carrier current telephone two discs form a condenser that is part of the oscillating circuit. When

in the last audio stage. Radiotron UX-120, for great volume Radiotron UX -210, a super-power tube several times as powerful as UX-120.

New Radiotrons, to be used



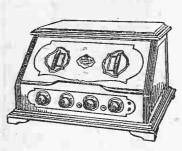
Radiola III, a two-tube set of antenna type. Over 200,000 already in use! A distance-getter with the headphones. Without accessories . \$15 Without accessories
With 2 Radiotrons and headpho

speaker, Model 100, RCA Cone type, achieving new clarity and far wider tone range. Can be used with any

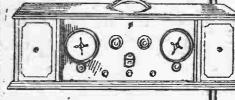


Radiola Loudel 102, the Cone type, with a Uni-Rectron. for super-power, tion from a 60 cycle, 110 volt A.C.lightingcir-

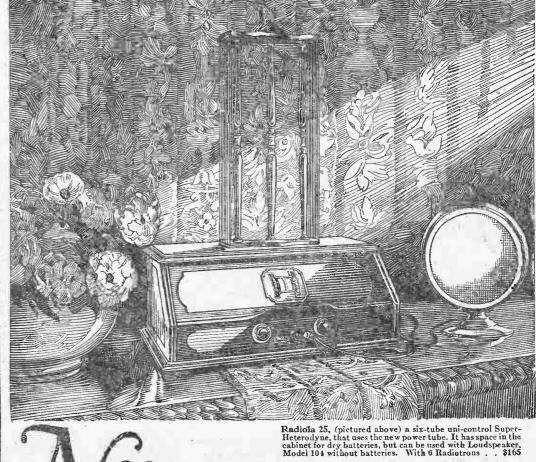




ola 20, an entirely new five-tube



Radiola Super-Heterodyne, standard six-tube Super-Heterodyne. Used with new power Radiotron UK-120 it gives greater volume and finer tone than ever. Without accessories \$116



principles in radio developed by RCA

RCA, General The new Radiolas herewith presented by RCA have be-Electric and hind them the research facilities—the engineering and Westinghouse manufacturing skill and experience—of General Electric and Westinghouse. These Radiolas embody new principles of radio reception—achieve new standards of performance—fulfill the responsibility which America places upon RCA for leadership in radio.

The new Radiolas meet the requirements of all five fundamentals of good radio reception.

New Loud- 1. Quality of Tone-Faithful reproduction of tone is the most important element in the enjoyment of radio. Now by the development of new Radiotrons, together with loudspeakers built on an entirely new principle and by the acoustical synchronization of all elements from the broadcasting station to the receiver-RCA has brought quality of tone to a perfection never before possible. The new speakers are capable of tremendous volume

without distortion and achieve faithful repro-

duction in every range of tone, high or low.

2. Volume of Tone-Even the Radiotrons most perfect tone, to be fully enjoyed, must reach your home with sufficient volume. The new

Radiotrons give greater volume on dry batteries than storage battery sets give today—and they make possible amplification up to tremendous power. The new loudspeakers give forth this increased volume of sound without dis-

No interfering 3. Selectivity—The most perfect reception can be destroyed by an interfering station; therefore selectivity is tremendously important. The

Super-Heterodyne has been positively demonstrated to be more selective than any other radio set on the market. The new Super-Heterodynes carry this selectivity to a still further degree of exactness.

Improved 4. Distance Range-In these Distance modern days of broadcasting, you Reception should be able to listen with enjoyment to distant as well as local stations. The Super-Heterodyne is already famous for distance reception. With the new tubes and the new loudspeakers, greater amplification is possible without distortion of the tone. This means enjoyment of improved distance recep-

Uni-control 5. Simplicity of Operation-Tuning Easy tuning-exact tuning-without technical knowledge of radio. has been carried to the last degree by a new uni-control system, at last accomplishing single control tuning without sacrifice of quality or selectivity.

Sets without Some of the new sets can be batteries—op- operated directly from the 110 erated on the well 60 evals A C lighting sign house current volt, 60 cycle A.C. lighting circuit, without batteries. They are attached as easily as your vacuum cleaner or electric lamp.

In addition to new developments in radio, RCA has achieved a record in low price for highest quality reception, by greatly reducing the price of Radiolas that have already proved their worth.

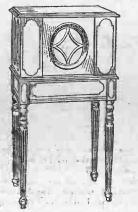
SEE all the new RCA Radiolas and RCA Loudspeakers at the Radio Show this week. HEAR them all this week at the private demonstration in the Hotel Pennsylvania, Southeast Ballroom. Ask for cards of invitation at the Radio Show, Grand Central Palace, Booths 17 and 18,

RCA-Radiola MADE BY THE MAKERS OF RADIOTRONS

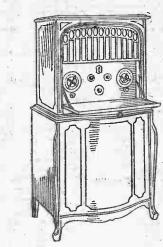
Radiola 28, eight-tube uni-control Su-per-Heterodyne, extremely selective. It gives great volume on dry batteries, or if used with the Model 104 Loudspeaker, all batteries can be replaced by 110 volt, 600 cycle A.C. lighting current. With 8



Radiola 30, a beautifully cabineted eight-tube Super-Heterodyne, with uni-control. It contains the new Cone type Loudspeaker, Model 100, and a loop—needs no antenna or batteries, but operates on the 110 volt, 60 cycle A.C. lighting current. It is remarkable for faithful reproduction of tone, and is capable of great power. Entirely complete. \$575



volume, range, and amazing acoustical fidelity never before achieved. Built on an entirely new principle. With Radiolas 25 or 28, it can be made to replace all batteries, operating entirely from 110 volt, 60 cycle A.C. house current. With all tubes. \$245



and six tube Super-VIII, the lamous stands and six tube Super-Heterodyne, in a cabinet that encloses both loop and doublette loudspeaker. Including the new dry battery power tube, entirely complete, except batteries. \$340



RCA Uni-Rectron, a rectifier-amplifier unit, that may be used to operate any type of loudspeaker from a 60 cycle, 110 volt A.C. lighting circuit. Complete \$105

RCA Duo-Rectron, a "B" battery eliminator that will supply plate voltage to any type of receiver. It provides uni-form voltage at lightest or heaviest cur-rent output. Operates from 110 volt, 60 cycle A.C. lighting circuit. Complete.

Write for booklet giving descriptions in more com-plete detail. Address the B RCA office nearest you.

Radio Corporation of America Chicago New York San Francisco

See our line at

Booths 53-57

the Armory

Booths 66-67

the Palace

New and Improved

e Boston abost

Now Leads

95,101 lines of

RADIO ADVERTISING

and the lead is constantly increasing

Here Are the RADIO ADVERTISING Figures for the First Eight Months of 1925:

Boston Post (Week-Day and Sunday)	Radio Advertising 115,877	NATIONAL Radio Advertising 108,306	Radio Advertising 224,183
Herald-Traveler (Week-Day and Sunday)	48,892	80,190	129,082
Globe (Week-Day and Sunday)	51,225	40,973	92,198
American (Week-Day)	26,536	46,419	72,955
Advertiser (Week-Day and Sunday)	22,727	13,573	36,300

For The Eight Months

The Post LEADS	the	Herald-Traveler	by	95,101	lines
The Post LEADS	the	Globe by		131,985	lines
The Post LEADS	the	American by -	£	151,228	lines
The Post LEADS	the	Advertiser by -	- 6	187.883	lines

For 16 Consecutive Years The Boston Post Has Led in Total Display Advertising

Here are the figures, furnished by the Boston Newspapers' Statistical Bureau, showing the volume of Display Advertising (excluding all Classified) published from Jan. 1 to Sept. 9, 1925.

	Agate Lines	XXXIII YARRAGA
BOSTON POST (Daily and Sunday)	7,159,035	STATE STATE OF THE
Boston Globe (Daily and Sunday)	6,740,672	418,363 lines
Herald-Traveler (Daily and Sunday)	6,729,741	
Boston American (Daily)	2,523,889	 - 2
Boston Adveriser (Daily and Sunday)	2,255,424	

Tune In On THE BOSTON POST For Results In The New England Market

While two radio expositions are at the Grand Central Palace, Lexing- munication with Canadian members ton Avenue and East Forty-seventh of the American Radio Relay League. Street. The nearest station is at the Grand Central. The express time Kingsbridge Road station is twentyeight minutes.

The exposition in the armory may be reached by subway, elevated and surface car. The routes follow: Subway

East Side. Lexington Avenue line to Kingsbridge Road.

West Side. Lenox Avenue-Bronx VDM, station of the Arctic. Park express to Mott Avenue station, Foster, who, by the way, bears the transferring (upstairs) to Jerome title of "District Superintendent of

Elevated

Street train as above. During rush ing each other. hours: Ninth Avenue express to Fordham Road, changing on same platform to Woodlawn express to Kingsbridge Road (one station).

press to Fordham Road station (these of experience, opened a new radio express trains operate all afternoon store at 62 Cortlandt Street, of this until about 6:30, after that express city. The owners of the establishto 125th Street, then local). Take ment have not spared expense in Van Cortlandt Park trolley at foot of furnishings. Sound-proof booths con-

Surface Cars Any northbound Bronx trolley stantly demonstrated. (Southern Boulevard, Third Avenue, The store also has a part depart-Webster Avenue) to Fordham Road, ment in which parts which are usutransferring to Van Cortlandt Park ally difficult to obtain may be purline direct to armory.

From Manhattan. Third Avenue curate knowledge of the radio art. trolley from 125th Street and Third Avenue (Broadway-225th Street line) to terminus, then walk or ride east on Kingsbridge Road to armory.

and then walking to Forty-seventh Street, or taking a surface car which Street, north on Broadway to 225th runs along Lexington Avenue and Street and as above to armory. passes directly in front of the Palace. Automobile routes to the Kingsbridge Road exposition follow:

East Side Fifth Avenue to 138th Street, right over Madison Avenue Bridge to Mott Avenue, to Concourse, to Kingsbridge West Side

Broadway to 225th Street, right up the hill to the armory.

At Etah Foster called in two

Avenue-Woodlawn express to Kings- the Canadian Arctic Region," thus West Side. Broadway-Van Cort- League headquarters station for that acting as an American Radio Relay landt Park express to 225th Street section of the world, has been getting station (Kingsbridge Road). Walk the messages from VDM back with east or take Bronx Park trolley to greater regularity since the work was

New Radio Store Opens The Fanmill Radio Company,

chased. The salesmen have an ac

Rumania Now Allows Sets

liament passed an act permitting the The exposition in the Grand Cen- use of radio receiving sets in that tral Palace may be reached by first country. It is expected that a worthgoing to the Grand Central Station while and active market will soon

> Westchester County Hudson River towns - South of

Broadway to 225th Street, up the hill to the armory. Bronx River Parkway south to Gun

Sound Shore towns-Boston Post

Routes Leading to | Amateurs Aid Each | This Week's Shows Other in Northland

An interesting story of assistance being conducted in this city at the rendered by one radio amateur to same time, although widely separated, another is told about the MacMillan it is possible to attend both in the and Canadian government Far North same evening. The one in the 258th expeditions when they were both at Field Artillery Armory, on Kings- Etah, Greenland. The Canadian govbridge Road, leads directly to the ernment steamer Arctic, on which Lexington Avenue subway, which has Robert McA. Foster is operator, had a station at Grand Central. The some difficulties with its short wave other exposition is being conducted radio transmitter that hampered com-

brother members of the league, also between the Grand Central and the distinguished for their contributions to amateur radio records with exploring expeditions. John L. Reinartz, noted exponent of short wave radio transmission theories and operator of WNP, radio station on board the Bowdoin, flagship of the MacMillan expedition, with Paul J. McGee, oper--Jerome Avenue-Woodlawn express worked as consultants with Foster in improving the sending qualities of

completed.

Reports of reception of messages Sixth Avenue local to 167th Street from VDM have been made by a numand Jerome Avenue, changing on same ber of member stations of the league, platform to Woodlawn express to with Walter Ellis, owner and operator Kingsbridge Road station. During of station 5AGN, at Oklahoma City, rush hours take Sixth Avenue ex- Okla, as the station farthest south in the group. Ellis reported hearing Ninth Avenue local to 145th Street, VDM call several Canadian amateurs changing to Sixth Avenue and 167th and then hearing the stations work-

corporation formed by merchants East Side. Third Avenue "L" ex- who are said to have had many years taining distinct wiring systems are installed so that any set may be in

On June 8, 1925, the Rumanian Par-

Harlem River to division towns-Hill Road, west to Jerome Avenue, to

Road to Bronx and Pelham Parkway, continuing into Fordham Road to Riverside Drive to end at Dyckman Jerome Avenue, north to armory.

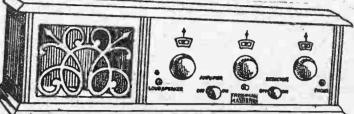
Here it is

But now - - -

Complete with built in loud speaker of great volume and superb tone quality.

Encased in - - -

As fine a heavy genuine solid mahogany cabinet as ever graced any radio set.



Model 5-F-5

At sixty dollars - -

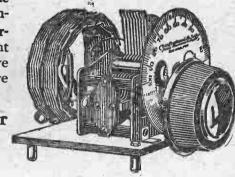
Not only complete with built in loud speaker and massive mahogany cabinet, but this wonder circuit has been scientifically perfected and each and every single part strengthened and co-ordinated.

For example - - -

The new Freshman Masterpiece straightline wave length condenser with vernier attachment which assures hair-line selectivity-permitting you to tune in the station you want without interference over the entire wave length range. This is merely one exclusive feature of the

World's Greatest Radio Receiver For sale at AUTHORIZED FRESHMAN dealers only

Chas. Freshman (6. Inc. Radio Receivers and Parts
FRESHMAN BUILDING
240-248 WEST 40TH ST.-NEW YORK.NY.
CHICAGO OFFICE 27 & LA BALLE ST.



Leading Radio Manufacturers

recognize McMANN SERVICE as the sure fire "Contact Point" for distribution of their profit building products.

Dealers who want Close Contact and Complete Jobbing Service can have it from us—Now.

Balkite Chargers

Paragon Sets

Fiat Loops

Akradyne Sets

Tone-a-dyne Sets

Havnes Griffin Parts

Sangamo Condensers

Bremer Tully Parts

Ward Leonard Chargers

Cunningham Tubes

Burgess Batteries Philco Batteries Amplion Speakers Teletone Speakers Marvodyne Sets

Timmons B Liminators and Speakers Remler Parts Pacent Parts Frost Parts Blandin Cabinets

Signal Cabinets

Deutsche Collapsible Loops Karas Straight line Condensers Weston Meters Jewel Meters

We are distributors for every part from Binding Posts to Complete Sets.

> "When Close Contact Is Required McMANN Service Is Desired."

Distributors of Radio Equipment, 122 Chambers Street, New York Telephone Walker 2100



is within the MEANS of ever Radio fan.
JUST THINK OF IT! ONLY \$22.50 (without tube) Use your old tube that will not operate in set but still lights. Cost one-twentieth of a cent per hour. Will save you enough in a year to pay for itself.

itself.

aranteed. Money back if not satisfactory.

Mail orders promptly filled.

A. H. WAAGE 6 Reade Street, New York



Distributors for

and 25 Other Standard Brands

Specialty Service Co. "Service is our middle name."

9 Hanson Pl., op. L. I. R. R.
Brooklyn. N. Y.
Nevins 7670-767

SAVE with SAFETY at

We are Authorized Agents for the following:

Forunswick RADIOLA Stromberg-Carlson Freed Eismann

RADA NEUTRODYNE

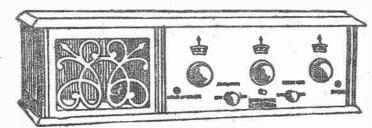
FRESHMAN MASTERPIECE APCO ATWATER-KENT Poolley CONSOLE APEX SONORA

David Trimes FX100 and VALEY Products

Liberal Allowances Made on All Old Sets in Exchange for 1926 Models

OPEN EVENINGS 66 Cortlandt St. 🖤

Selling Fast! The Radio Sensation of the Season!



5-F-5 New and Improved Freshman Masterpiece 5-Tube Tuned Frequency Radio Receiver!

On Terms as Low as \$1 Weekly

What Other Set Offers So Much for \$60?

Set equipped with new loss straight

line vernier condensers of high ratio issuing hairline selectivity.

New patented precision speedometer

type dials showing only a small por-

tion of the wavelength band at one

time—an exclusive Freshman feature.

Truly the Wonder Set of the Season! Read These Specifications

Built-in loud speaker in same onepiece cabinet containing the set. The loud speaker is of great volume and superb tone quality—fashioned by makers of the highest class phonograph in the world.

Entire cabinet finely polished and made of beautiful solid mahogany.

Highest class accessories to complete this set for only \$1.00 extra per week.

Bloomingdale's --- Radio Salon, Third Floor.

Open Monday An entrance at 166

Street-Lexington to Third Avenue

PATTERN 140

TEW 2 in. single and double reading instruments for mounting on receiving sets. Tests accurately condition of batteries.

Descriptive Literature sent free on request. Complete Line Displayed at Booth 14, Section A John M. Forshay

52 Vesey St., N. Y. C. Cort. 4134

Solderless Snap Terminal

For Panel-Ground and Battery Connections.

Instantaneous in Opera tion - Positive Contact

The Base Stud is tapped and furnished with 8-32 screw and washer. It fits all "B" batteries with

Used on TUNGAR RECTIGON—PHILCO -EXIDE.

Terminal Complete, either style..... 15c Extra Base Studs... 5c

Rajah Auto Supply Company Bloomfield, New Jersey.

At the Radio Show

& Long O. Sienne

You will be interested in the Edison Radio Power Unit Exhibit-Grand Central Palace, September 12th to 19th.

Make it a point to visit Booth 117-125. Edison Radio Batteries are the long-life, steelalkaline batteries that outlast four or five of any other type. Edison Batteries are notable for clear reception and odorless trouble-free performance.

Radio

ies

Radio Department Edison Storage Battery Co. Orange, N. J.

New York Office: 247 West 35th St.

Women Have Had Huge Influence on RadioDevelopment

By Frances Robinson Field Secretary Radio Corporation of America

In the early days of broadcasting radio was chiefly a man's game. Appeal to his love for making models at home, his pleasure in mastering a complicated mechanism and his masculine liking for "junk" were the dominant ideas in the first sets put on the market. This may be called the "storage battery" era, when acid was almost sure to be spilled over the parlor rug and when sweeping vires and batteries all over the place.

Soon the slogan of "Radio in the Home" was coined, and it was real- \$ 200 ized that radio must make its appeal to those whose domain the home isthe women. Radio design and development began rapidly to proceed along these new lines.

First came the dry-battery tube. This is really a monument to woman's distaste for messiness, and she won a signal victory when storage cells were relegated from the parlor to the attic. Son may still charge his cells with a home-made rectifier, but mother wants a set with nice, clean dry cells, and out-of-sight ones at

Then came simplifying the controls. Father rather liked the old ten-knob sets, for they proved his cleverness in mastering them-when he did! But the lady of the house has no time to try, try again when she wants a little radio music to lighten the burden of sweeping or ironing-she wants to turn on the battery switch. twist one dial to the station she likes best, and then have it work while she sweeps. This explains why the single-circuit receiver proved so popular when it was brought out and why manufacturers to-day are stressing the single-dial set.

Lastly, woman's influence was clearly shown in the outward design of receivers. No woman ever liked. the sight of an ungainly loud speaker on the table or over the set, so receivers with built-in loud speakers found popularity among the womenfolks. Hand in hand with this came artistic designs of cabinets. The earlier receivers for the home were about as beautiful as varnished cigar boxes, but to-day milady is not satisfied unless the radio receiver matches the rest of her carefully selected furniture. Home beautiful and radio beautiful owe their devel-

opment to the women of the home. Possibly the pendulum has swung just a little too far. Perhaps a trifle too much attention is being placed to outward looks and not enough to the inner qualities of the set. After all, what a radio receiver must do is bring in stations within a moderate distance with perfect reproduction and with no distortion or "tinny" sound, and with the least interference from other stations. Beauty of cabinet will not help one iota in these lines. The engineer who designs the radio circuits, the workman who assembles the parts. ecide this. This merely by way o a word of caution to the ladies, to choose for performance first and elegance a close second.

We are going back to storage batteries, too. Some of the newer sets will have "trickle-charge" storage batteries in them, but there will be no danger of spilled acid, so the ladies need have no fear. Others of the latest types of sets will operate right off the lamp socket, so that mother can forget her dearly learned knowledge of connecting plus to minus when putting in new filament batteries. But the basic principles of beauty, no sloppiness and performance still remain.

Broadcasting has, of course, kept pace with the swing toward pleasing the real buyer of a radio set-the woman of the house. Prizefights, baseball descriptions, the stock market used to predominate in broadcasting specialties. To-day we have fashion shows described by radio, marketing for the day described by an expert, cooking lessons over the loud speaker, and the like, fast crowding out the masculine specialties. The transition period from the home-made sets to high-grade outfits designed and constructed by reputable manufacturers is passed. Little by

little the last parts-built receiver is

being sent up to the attic, and almost

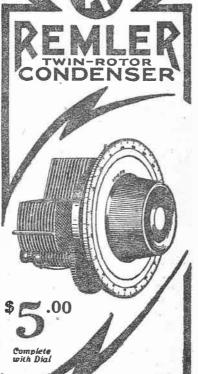
universally we find the artistic receiv-

ing equipment which women have demanded, and are now getting.

DEMANDS A

CABINETS

You Can Cover the New England Radio Market Through New England's ONE Dominant Newspaper



Factory Testing of each condenser for capacity at The broadcast wave lengths is only one of the many precautions which **Territory**

body capacity by proper insulation Now is the time to replace old that is making radio history.

RADIO MFG. C:

RADIO STORES

NEW YORK - 178 Greenwich S BROOKLYN 9 Willoughby S

David Grimes \$40.50 Duplex The master set of radio. No storage batteries required. IN-STALLED FREE.

Latest 5 Tube Set Straight Line Frequency Condensers

Radiola Superheterodyne te famous R.C.A. \$11

OUR SPECIAL PRICE. OPEN EVENINGS

For the best

RESISTANCE COUPLED **AMP**

Resistors, Couplers, Grid Leaks and Mounts, ook for the Veby Display Booth 16 at the RADIO WORLD'S FAIR 258 Field Artillery Armory Sept. 14th to 19th VEBY RADIO COMPANY 47-51 Morris Ave., Newark, N. J.

SAFETY FOR RADIO BRACH Vacuum Lightning Arrester

VARY & CO., INC.

All Styles All Sizes All Prices The largest stock of Cabinete in New York. The Cabinet you want is here.

The territory of the Boston Post is New England, 19 20 21 22 23 24 "Where Broadcasting Began," the home of 17 Broadcast stations of 100 watts 25 26 27 28 29 30 31 power and over, the home of the FIRST radio show. New England is the birthplace of radio; radio was developed in this territory. Every Radio Fan In New England has New England Will Read

Possibilities in New England

1,751,813 families (latest U. S. Census). There are 1,750,000 automobiles registered in this prosperous ter-

ritory, the per capita bank balance is \$375. Yet there are only 250,000 radio sets in New England. There are more than a million families who are radio prospects if YOUR sales message is delivered to them in the correct manner.

The Boston Radio Show

The second largest radio show in America, held in the country's second largest exposition hall. The Boston

Post Radio Show Section is ALWAYS the year's GREATEST NEW ENGLAND RADIO PUB-LICATION. This year it will be bigger and better than ever.

The Medium

The circulation of the Boston Post is 372,872 daily - 359,336 Sunday (Net Paid). There is a Boston Post sold for every three out

of four homes within the Greater Boston Shopping Zone; for every second home in Massachusetts, every second home in New Hampshire, every third in Maine and every fourth in Vermont.

The Boston Post published 93,869 MORE lines of radio advertising last year than the second

During the first eight months of this year the Post published MORE radio advertising than any TWO Boston papers COMBINED, leading the second paper by 95,101 lines. Analysis of schedules now being drawn up indicates that the Post will finish 1925 with a LEAD of close to 200,000 lines in RADIO ADVERTISING.

The Boston Post publishes the most complete radio programme daily of any newspaper in the United States and maintains its own testing laboratory. The Post's Technical Editor is an instructor in the Massachusetts Institute of Technology. POST radio news is ACCURATE.

The Bostom abost

Sun. Mon. Jue. Wed.

The Fifth Annual Boston Radio Show will open on October 12—the start of the radio "season." The alert radio manufacturer will take advantage of The Boston Post RADIO SHOW SECTION to boost HIS season in New England with a smashing message, an appeal which The BOSTON POST will carry into the homes of hundreds of thousands of pro spective purchasers.

> Forms close on October 9 for this 1925 Radio Section—early copy will mean "better position"

Order Your Space Now Get Your Copy In Early

You will have a radio season of regret if you are not listed in "The Boston Post Radio Show Section for 1925"

SPECIAL REPRESENTATIVES: Kelly-Smith Co., New York and Chicago

The Herald Tribune Daily Broadcasting Programs for Week Ending September 19

TO-DAY

WJZ-NEW YORK CITY-455 9 a. m.—Children's Hour: Stories, music.
10:40 a. m.—Chimes from Grace Church.
11 a. m.—Church services.
2:30 p. m.—Sunday Radio Forum; Dr.
Chas. L. Goodell.
7 p. m.—Nathan Abas's Orchestra. B p. m.—Final baseball scores. 8:05 p. m.—To be announced. 9 p. m.—Lakewood Farm Inn Ensemble. 10 p. m.—Godfrey Ludlow. violinist. WJY-NEW YORK CITY-405

WEAF-NEW YORK CITY-492 address by the Rev. Harry Farmer; Federation Quartet.
7:20 to 9:15 p. m.—Musical program by "Capitol Gang."
9:15 to 10:15 p. m. — Symphony orchestra.

WGBS—NEW YORK—316
3:30 p. m.—Warner's Theater program.
8 p. m.—Program from Steel Pler Studio.

WMCA—NEW YORK CITY—341
11 a. m.-12:15 p. m.—Christian Science services.

services.
6:15 p. m.—Roemer's Homers.
7 p. m.—Ernie Golden's Orchestra.
7:35 p. m.—Olcott Vall's String Ensemble
9-10 p. m.—Asbury Park Symphony Or WRNY-NEW YORK CITY-258
m.-Lafayette Male Quartet.
m.-''Was Roosevelt Religious?'' WHN-NEW YORK CITY-361 1-1:30 p. m.—Marsh McCurdy, organist, 2:30-3:30 p. m.—Queens County Christian

Endeavor.

5 p. m.—Roseland Orchestra.

10:45 p. m.—Janssen's Orchestra.

WNYC—NEW YORK CITY—526

8:50 p. m.—Baseball results.

9 p. m.—Brooklyn Strand Theater program from stage and studio. WFBH—NEW YORK CITY—273

2 p. m.—Arrighi Church Choir Singers.
5:30 p. m.—Betty Smith's Artists.
6 p. m.—Masonic news.
6:15 p. m.—Arthur J. Hand, barytone.
6:30 p. m.—Bossert Lumber Jacks.
7 p. m.—Orchestra.

WBBR-STATEN ISLAND, N. V.-244 solos. 10:30 a. m.—Bible lecture, Judge Rutherford.
11 a. m.—Tenor and orchestra selections.
9 p. m.—Choral singers; string quartet.
9:30 p. m.—Bible lecture, Judge Ruther

9:45 p. m.—Isabella Henderson, soprano. m.—Lillian Gordone, contralto. p. m.—Polla's Orchestra. WOO—PHILADELPHIA—508 10:45 a. m.—Morning services. 2:30 p. m.—Musical exercises. 6 p. m.—Sacred organ recital. WIF—PHILADELPHIA—508 4:15 p. m.—Musical services.
7:15 p. m.—Evening service.
10:00 p. m.—Feature program.
WCAU—PHILADELPHIA—278 5:15 p. m.—Aeolian Mixed Quartet.
5:15 p. m.—Undenominational service.
WFI—PHILADELPHIA—395 7:30 p. m.—Services.
WPG—ATLANTIC CITY—300

9 p. m.—Seaside Trio. 11:15 p. m.—Strand organ recital. WRW—TARRYTOWN, N. Y.—273 8:05 p. m.—Services. 10:30 p. m.—Musicale. WGY—SCHENECTADY—380

a. m.—Service.

b. m.—St. George's Episcopal Churc

c. m.—Lakewood Ensemble.

m.—Godfrey Ludlow, violinist.

WGR—BUFFALO, N. Y.—319

7:20 p. m.—Capitol Theater Gang. 9:15 p. m.—Symphony orchestra. WBZ—SPRINGFIELD, MASS.—333 10:45 a. m.—Church services.

9 p. m.—Talk, Dr. Tehyi Hsieh,

9:30 p. m.—Organ recital. p. m.—Church music. WCTS—WORCESTER, MASS.—268

7:20 p. m.—Capitol Theate.
9:15 p. m.—Symphony orchestra
WCAP—WASHINGTON—469

12 noon—Service.
5 p. m.—Service.
7:20-9:15 p. m.—"Capitol Theater Gang."
9:15 p. m.—Program from WEAF.
KDKA—PITTSBUEGH—309 m.—Baseball scores. 8 p. m.—Baseball scores.
8 p. m.—Interdenominational service.
WCAE—PITTSBURGH—461

.—People's church services, m.—Dinner concert, m.—Capitol Theater Gang, m.—Program from WEAF. m.-Program from WEAF. WEAR-CLEVELAND-390 m.—"Evening Hour."
WLW—CINCINNATI—422 WKRC-CINCINNATI-326

p. m.—Songs and service, m.—Classical program, aidnight—McKay's Orchestra WSAI—CINCINNATI—326

WWJ-DETROIT-353
7:20 p. m.—"Capitol Theater Gang."
WLS-CHICAGO-345 WLS—CRICAGO—340
8:30 p. m.—Organ solos,
9 p. m.—Little Brown Church.
WCBD—ZION, ILL.—345
10 p. m.—Treble Clef Chorus; celestia
bells and trio.

MONDAY

WEAF—NEW YORK CITY—492 6:45-7:45 a. m.—Health exercises." 4 p. m.—Cameron Emslie, planist. 4:15 p. m.—Ellie Ebeling, soprano. 4:30 p. m.—Cameron Emslie, planist. 4:45 p. m.—"Hoosier Poet," Cha

6 p. m.—Dinner music.
7 p. m.—Walter Leary, barytone.
7:15 p. m.—Musical program from Strand
Theater; remarks by Joseph Plunkett;
featured vocal and instrumental artists.
8:30 p. m.—"Tower Health Talk."
8:45 p. m.—Marie Opfinger, soprano; Albert Miller, tenor.
9 p. m.—Music by gypsies.
10 p. m.—Joseph Diskay, tenor.
10:15 p. m.—Jeanne Kramer, planist.

15 p. m.—Jeanne Kramer, plantst. 30-11:30 p. m.—Bossert Marine wmca---new york city-341 WMCA—NEW YORK CITY—341

11 a. m. to 12 noon—Musical program.
12 noon—Olcott Vail's String Ensemble.
6 p. m.—Olcott Vail's String Ensemble.
6:30 p. m.—Ernie Golden's Orchestra.
7:30 p. m.—Lullaby music.
8 p. m.—Lecture on Christain Science.
9 p. m.—Symphony orchestra.
10 p. m.—Neighborhood Players.
11 p. m.—Messner Brothers' Orchestra. WJZ—NEW YORK CITY—455

10 a. m.—News service.
1 p. m.—Meyer Davie's music.
2, 4, 5:20, 8 and 10:25 p. m.—News.
4:6 p. m.—Scores and racing (half-hourly
4:10 p. m.—John Daniel, readings.
4:35 p. m.—Constance Towne's pupils.
5:26 p. m.—Market reports.
5:50 p. m.—Financial summary.
6:05 p. m.—United States Navy Band.
7:25 p. m.—Organ recital.
8 p. m.—Scores and racing results.
8:10 p. m.—Radio Franks, songs.
8:30 p. m.—Program from Landay Hall.
9:30 p. m.—Program from Landay Hall.
9:30 p. m.—Talk.

10:30 p. m.—Joseph Knecht's Orchestra. WGBS—NEW YORK CITY—316 0 a. m.—Timely talks with Terese. 0:10 a. m.—Jahn Cohen, pianist. 10:10 a. m.—Jann Conen, pianist. 10:40 a. m.—Fashion talk; pianist. 1:30 p. m.—Scripture reading. 1:35 p. m.—Lillian Lorcher, soprano. 2 p. n.—Mildred Kelly, Negro spiritua 2:30 p. m.—Radio world's fair; Blor

Heath's Serenaders,
3 p. m.—Talk on primaries,
3:10 p. m.—Rosalie Blanchard, soprano,
3:20 p. m.—Talks; songs,
3:30 p. m.—Rosalie Blanchard,
3:40 p. m.—Interview with Blanche Yurk
3:50 p. m.—Rosalie Blanchard, p. m.—Uncle Geebeel :30 p. m.—Premier Orchestra. WHN-NEW YORK CITY-361

songs.
4:45 p. m.—Alice Harvey, planist.
5 p. m.—Children's hour; Al Wilson's Play 7 p. m.—Beulah Bromberg, songs.
7 p. m.—Beulah Bromberg, song writer
7:15 p. m.—Rubey Cowan, song writer
7:30 p. m.—Gwen Pollard, soprano.
7:40 p. m.—Harry Reiss, tenor.

7:40 p. m.—Harry Reiss, tenor.
7:50 p. m.—Alberta Jones, singer.
8 p. m.—"Storage Batteries," H. B. Shontz.
8:05 p. m.—C. Bryce Little, barytone.
8:45 p. m.—Ethel Walker, prima donna.
9:15 p. m.—Ethel Walker, prima donna.
9:15 p. m.—Drum, Fife and Bugle Corps.
10:30 p. m.—Grossman and Osborne, singers. 1 p. m.—Marsh McCurdy, organist. 1:30 p. m.—Silver Slipper Revue. WNYC—NEW YORK CITY—526

8:15 p. m.—Rosamund Leweck, soprano. 8:30 p. m.—"Jewish Holiday Cards." 8:45 p. m.—Concert program by artists. 10:15 p. m.—"Trend of the Times." 10:30 p. m.—Police alarms; weather. WRNY-NEW YORK CITY-258 12:02 p. m.-Trio. 1 p. m.-Radio industry hour. 12:02 p. m.—Trio.

1 p. m.—Radio industry hour.

1:02 p. m.—Sports forecast.

1:10 p. m.—Sudio program.

7 p. m.—Sports résults.

7:10 p. m.—Commerce of the day.

7:20 p. m.—Code lesson.

7:45 p. m.—Major Dent Atkinson.

8 p. m.—Ferrucci's Orchestra.

8:15 p. m.—Wevolution of Jazz."

8:35 p. m.—Wedley.

8:45 p. m.—'Evolution of Mars."

9:15 p. m.—Music Travelogue.

9:45 p. m.—Elsa Ellis, songs.

10 p. m.—The Poetry Post.

10:15 p. m.—Bob Ward's Little Wards.

10:45 p. m.—Jazz plane concert.

11 p. m.—Dance program.

WFBH—NEW YORK CITY—273

WFBH-NEW YORK CITY-273 m.—Studio program.
m.—Baseball scores (quarter hourly)
m.—Esther Brankin, soprano. m.—Studio program. m.—Reitz and Ward, songs.

WOKO-NEW YORK CITY-233 WOKO—NEW YORK CITY—233
7 p. m.—Program from Radio Show.
8 p. m.—William Mahoney, barytone.
8:15 p. m.—Queen City Four.
8:35 p. m.—Francine Vydo, soprano.
8:50 p. m.—Francine Vydo, soprano.
9:05 p. m.—Willo Orchestra.
9:30 p. m.—Mabel Webb, soprano.
9:45 p. m.—Willo Orchestra.
WBBR—STATEN ISLAND, N. Y.—244
8 p. m.—Irene Kleinpeter, soprano.
8:10 p. m.—Lecture, "Publio Safety."
8:35 p. m.—Vocal duet.
8:40 p. m.—Bible instruction.

3:40 p. m.—Bible instruction.
3:50 p. m.—Fred Franz, tenor.
WAHG—RICHMOND HILL, N. Y.—316 WARD—MACHAROLD HIL., N. 12—310
12:30 p. m.—Queenie Goldman.
7:30 p. m.—Thornton Fisher sport talk.
7:45 p. m.—Harold Brandhorst, planist.
8 p. m.—Governor Al Smith.
8:05 p. m.—Evan Davies, barytone.
8:20 p. m.—Emery Deutsch, violinist.
8:30 p. m.—Horace J. Taylor, readings.
8:45 p. m.—Eugenie Baumann, soprano.
9 p. m.—C. C. Jones, barytone.
9:15 p. m.—The Shamrock Four.
9:15 p. m.—Synchrophase Trio

m.—Synchrophase Trio. m.—Maude Mason, pianist. 10 p. m.—C. C. Jones, barytone. 10:15 p. m.—The Shamrock Four. 10:30 p. m.—The Colonial Royal Orchestra. 12-2 a. m.—Billy Eisenhuth's Lynbrook-

12-2 a. m.—Billy Eisenhuth's Lynbro
lyns

WOR—NEWARK—405
6:45-7:15-7:45 a. m.—Gym class.
2:30 p. m.—Bertha Frid, soprano.
2:45 p. m.—Ruth Gordon.
3 p. m.—George Keane, barytone.
3:15 p. m.—Bertha Frid, soprano.
3:30 p. m.—George Keane, barytone.
3:45 p. m.—George Keane, barytone.
3:45 p. m.—'Clothes."
6:15 p. m.—'Words mispronounced."
6:17 p. m.—Shelton ensemble.
7:16 p. m.—'Sports," Bill Wathey.
7:30 p. m.—Edward Bierstadt.
9:45 p. m.—Lena Nerenberg, planist.
10 p. m.—Belyamin De Casseres.
10:15 p. m.—Lena Nerenberg, planist.
10:30 p. m.—Belyamin De Casseres.
10:15 p. m.—Lena Nerenberg, planist.
10:30 p. m.—Al Ritter's Orchestra.
WAAM—NEWARK—263
11 a. m.—Happy Hour program.
7 p. m.—Joe Brown, tenor.
7:15 p. m.—Jack Press's Orchestra.
7:30 p. m.—Sport oracle; orchestra.
7:30 p. m.—Sport oracle; orchestra.
8:30 p. m.—Sport oracle; orchestra.
muth.
9 p. m.—"Smiles and Giggles."

m.—"Smiles and Giggles." 9 p. m.—"Smiles and Giggies. 9:20 p. m.—Arline Felker's pupils. 10 p. m.—Fred Frey's Sirens. WGCP—NEWARK—252

composers.
5:15 p. m.—Lucille Hegamin, singer.
6 p. m.—Moe Mann, barytone. 6 p. m.—Moe Mann, barytone.
8 p. m.—Piano solos.
8:30 p. m.—Piano solos.
8:35 p. m.—Polla's Orchestra.
9 p. m.—Vincent Laine, tenor.
9:15 p. m.—Lillian Gordone, contralto.
9:80 p. m.—Kennedy Harmony Quintet.
10 p. m.—Raymond Maher, barytone.
10:15 p. m.—Polla's Orchestra.
12 p. m.—Midnight reveis.
WFI—PHILADELPHA—395

1 p. m.—Tea room orchestra.
3:10 p. m.—Cliff Edgerton's Syncopaters.
3:45 p. m.—Fashion feature.
6:45 p. m.—Roof garden broadcast.
WLIT—PHILADELPHIA—395
12:05 p. m.—Organ recital; orchestra; recital

cital.
2-3 p. m.—Concert orchestra; recital.
4:30 p. m.—Magazine corner.
7:30 p. m.—Dream Daddy. p. m.—Magazine corne p. m.—Dream Daddy. m.—Short agro-waves. 3:15 p. m.—Concert orchestra.
3:30 p. m.—Artist recital.
9 p. m.—Stanley Theater; movie 9 p. m.—Stanley Theater; movie revorchestra; organ.
10 p. m.—Dance orchestra.
10:30 p. m.—Vandevlie features.
WCAU—PHILADELPHIA—278

4:45 p. m.—Grand organ; trumpets.
7:30 p. m.—Dinner music.
8 p. m.—Strand Theater program.

o. m.—Dance music.
WHAR—ATLANTIC CITY—275 m.—Seaside Trio.
p. m.—Stories for little folks. WPG—ATLANTIC CITY—300 3:30 p. m.—Dance orchestra. 1:30 p. m.—Afternoon tea music. 1:40 p. m.—Baseball scores; organ recita p. m.—Morton Trio dinner music. p. m.—Morton 1710 dinner music. 3:05 p. m.—Winchester Garden Five. 9 p. m.—Traymore Concert Orchestra.

m.—Dance orchestra.
WGY.—SCHENECTADY.—380
n.—Music; talk, "Tomatoes,"
p. m.—Asia Orchestra.
p. m.—Dinner program.
p. m.—Address, Dr. R. W. Thatcher.
m.—Program by artists. 5 p. m.—Program by artists.
5 p. m.—WGY Orchestra; address.
WRW—TARRYTOWN, N. Y.—273 2:05 p. m.—Stories; music; scores.
0:05 p. m.—Musical program; scores.
0:40 p. m.—Concert. :05 p. m.-Entertainment.

10:30p. m.—Orchestra.
WGR—BUFFALO, N. Y.—319
6:30-7:30 p. m.—Dinner music.
9-10 p. m.—Knell's Dance Orchestra. 9-10 p. m.—Knell's Dance Orchestra 11 p. m.-1 a. m.—Supper music. WHAZ—TROY, N. Y.—380 9:15 p. m.—Gordon's Orchestra; songs.
11 p. m.—Cotton Blossom Singers.
WHAM—ROCHESTER—278 w.—Scores; weather.
WJAR—PROVIDENCE—306

a. m.—Housewives' Exchange.
5 p. m.—George Dion, solos.
5 m.—'Berry Spring Time."
6 m.—Gypsies.
WTIC—HARTFORD, CONN.—476 6:45 p. m.—Health exercises. 6:30 p. m.—Big Brother Club, 7:20 p. m.—Lost and Found; scored. 7:30 p. m.—Brockton Night.

p. m.—Musicale. WISZ—SPRINGFIELD, MASS.—333

WRC—WASHINGTON—469 10 a. m.—Women's Hour from 1 p. m.—Organ Recital. 2 p. m.—Shoreham Orchestra. -United States Navy Band. WCAP-WASHINGTON-469 6:45 a. m.—Health Exercises. 8:30 p. m.—Health Talk.

9 p. m.—Gypsies. 10 p. m.—Historic talk. KDKA—PITTSBURGH—309 3:30-7 p. m.—Scoresi 9:45 p. m.—Musical program. WCAE—FITTSBURGH—461

TUESDAY

WJZ-NEW YORK CITY-455 . m.—Women's hour . m.—News. 11 a. m.—News.
1 p. m.—Nathan Abas's music.
2. 4, 5:20, 7:50, 10:55 p. m.—News.
4-6 p. m.—Scores, racing (half-hourly).
5:20 p. m.—News. scores, racing.
5:26 p. m.—Market reports.
5:50 p. m.—Finahcial summary.
6:01 p. m.—Flanchial summary.
6:01 p. m.—Baseball, racing returns, election returns (ten-minute schedule).
7 p. m.—'Dandie Dinmonts,' Frank Dole, of the Herald Tribune.
7:155 p. m.—Vanderbilt Orchestra.
7:50 p. m.—Scores, racing results.

10 p. m.—Jan wess., 10:30 p. m.—Sea songs. — Mayflower Orchestra. WEAF—NEW YORK CITY—492 6:45-7:45 a. m.—Health exercises. 11 a. m.—Vee Lawnhurst, planist. 11:10 a. m.—Board of Education lecture. 11:25 a. m.—Vee Lawnhurst, planist. 11:35 a. m.—'Motion Ficture Forecast''.

piano.

2 noon—Market and weather reports.

p. m.—Iris Torn, pianist.

15 p. m.—Elsie Ahrene, soprano.

30 p. m.—Women's program.

p. m.—Dinner music. 6 p. m.—Dinner music.
7 p. m.—Margaret Olson, soprano.
7:10 p. m.—Columbia University lecture.
7:30 p. m.—Edward Steele, planist.
7:50 p. m.—Louis Caton, tenor.
8 p. m.—Ross Gorman's Orchestra.
8:30 p. m.—"The Gold Dust Twins."
9 p. m.—"Eveready Hour."
10 p. m.—Grand opera, "Maritana."
11-12 p. m.—Vincent Lopez's Orchestra.

WGBS—NEW YORK CITY—316 0 a. m.—Timely talks with Teres 0:10 a. m.—Mildred Marsh, soprand

10:10 a. m.—Mildred Marsh, soprano.
10:20 a. m.—Talk on "Marriage"; songs.
10:40 a. m.—Etiquette talk; songs.
1:30 p. m.—Scripture reading.
1:35 p. m.—Blossom Heath's Screnaders.
2:30 p. m.—Radio World's Fair; Crete Carton Jack Cohen. 3 p. m.—Dancing lessons. 3:10 p. m.—Juliette Lane, soprano 3:20 p. m.—United Parents' As

3:20 p. m.—United Parents' Association talk.
3:30 p. m.—Jullette Lane.
3:40 p. m.—Piano lessons; songs.
6 p. m.—Uncle Geebee.
6:30 p. m.—Vincent Sorey concert; dance orchestra.

p. m.—Arrowhead Concert Orchestra.

p. m.—Paul Gallico, "Prizefight."

110 p. m.—Chayat and Frank, duets.

220 p. m.—Anna Jufe, soprano.

330 p. m.—Polish program.

e10:30 p. m.—Arrowhead Dance Orchestr.

WHN.—NEW YORK CITY.—361
12:30 p. m.—Marsh McCurdy, organist.
2:15 p. m.—Lexington Theater Orchestra.
4:30 p. m.—Alfred Skolnick, harmonist.
4:45 p. m.—Jose Vallina, tenor.
5 p. m.—Children's hour; Uncle Robert's
Pals.
7:30 p. m.—Oakland's Characa :30 p. m.—Negro program. 0:30 p. m.—Arrowhead Dance Orchest. Pals.
7:30 p. m.—Cakland's Chateau Shanley.
8 p. m.—Estelle Cohen, soprano.
8:15 p. m.—Estelle Chen, soprano.
8:15 p. m.—Bille Robankman, pianist.
8:20 p. m.—Bob Miller, Lewis Piotti, songs.
8:45 p. m.—Billie and Marie Van, singers.
9 p. m.—Charles La Ruffa, banjoist.
9:15 p. m.—Leslig McLeod, tenor.
9:30 p. m.—Palisades Orchestra.
10 p. m.—Melody Male Quartet.
10:20 p. m.—Della Riordan, barytone.
10:30 p. m.—William West's Orchestra.
WMCA—New YORK CITY—341

10:30 p. m.—William West's Orchestra,

WMCA—NEW YORK CITY—341

11-12 a. m.—Ida Allen's hour.
12 noon—Olcott Vail's String Ensemble,
3:30-4:30 p. m.—Radio World's Fair.
6 p. m.—Olcott Vail's String Ensemble,
7 p. m.—Jack Wilbur's talk.
8 p. m.—Aage Sorensen, barytone.
8:30 p. m.—Musicale.
9 p. m.—Dance orchestra.
10 p. m.—Hour of music.
11-12 p. m.—Ernie Golden's Orchestra, 10 p m.—Hour of music.

11-12 p, m.—Ernie Golden's Orchestra.

WNYC—NEW YORK CITY—526

7 p. m.—Market high spots.

7:10 p. m.—The Canadians; police alarms

8 p. m.—Baseball results.

WGCP 252 Polla's WHN 361 Janssen's MONDAY, SEPTEMBER 14 WHN
WGR
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WLIT
WGCP
WOR
WEAF
WAHG
WJZ
WMCA
WGR
WRNY
WAHG Roseland
Knell's
Gordon's
Dance music
Dance music
Polla's
Al Ritter's
Jack Albin's
Colonial Royal
J. Knecht's
Dance music
Messner Bros,
Vincent Lopez
Dance music 8:05 9:00 9:15 10:00 10:15 10:30 10:30 10:30 11:00 11:1 11-1 12-2 8 p. m.—Baseball results. 8:05 p. m.—The Canadians. 8:15 p. m.—Police Band. 10:15 p. m.—Primary election returns; musical program. 10:30 p. m.—Police alarms; weather. 10:35 p. m.—Election returns; musical program.

WJY-NEW YORK CITY-405 7:30 p. m.—Ambassador Trio. 8:15 p. m.—Zoological Society series. 8:30 p. m.—Georgia Minstrel Boys. WRNY-NEW YORK CITY-258 . m.—Trio. .—Radio Industry Hour. i p. m.—Radio inquery risting i:02 p. m.—Sports forecasts.
1:10 p. m.—Studio program.

1:10 p. m.—Studio program.
7 p. m.—Sports results.
7:10 p. m.—Commerce of the day.
7:20 p. m.—Women's Lawyers' Associati
7:30 p. m.—History of the World.
7:45 p. m.—Hon. Joseph Quittner.
8 p. m.—Concert orchestra.
8:15 p. m.—Light Opera Ensemble.
8:30 p. m.—'Engineering as a Career."
8:45 p. m.—Light opera ensemble.
9 p. m.—Sadrian Trio.
9:15 p. m.—Current Theater.
9:30 p. m.—'The Chocolate Soldier."
9:45 p. m.—Alexandre Zettlin.
10 p. m.—Radio World's Fair.
WERL—NEW YORK CITY—273

WEBJ-NEW YORK CITY-273
p. m.—Dan Barnett's Orchestra,
30 p. m.—Mardi Gras program,
p. m.—Railroad talk, Garrow Geer. 8 p. m.—Railfoad tain, Gallow Good. 8:10 p. m.—Isabel Henderson, soprano. 8:30 p. m.—Mardi Gras program fr Coney Island. WOKO-NEW YORK CITY-233 3:30-11 p. m.—Bike races; Joe Bas WFBH-NEW YORK CITY-273

2 p. m.—Orchestra.
3 p. m.—Studio program.
4 p. m.—Baseball scores (quarter hourly)
4 p. m.—Richard Hitter's Orchestra.
5 p. m.—Arthur Hand, barytone.
5:15 p. m.—Melody Girls.
5:30 p. m.—Songs.
6:15 p. m.—Radio talk, Bill Schudt.
6:30 p. m.—Bossert Lumber Jacks. WAHG—RICHMOND HILL, N. Y.—316 12:30 p. m.—Harry Dudley, songs. WBOQ—RICHMOND HILL, N. Y.—236

9:45 p. m.—George Wooley, saxophonist.

WOR—NEWARK—405
6:45-7:15-7:45 a. m.—Gym class.
2:30 p. m.—Wm. Field, barytone.
2:45 p. m.—Blanche Yurka.
3 p. m.—Wm. Field, barytone.
3:15 p. m.—Ray Nichol's Orchestra.
6:15 p. m.—"Words Often Mispronounced
6:17 p. m.—"Sports," Bill Wathey.
6:30 p. m.—"Man in the Moon Stories."
7 p. m.—Shelton Ensemble.

WAAM—NEWARK—263
11 a. m.—Happy Hour; Cooking School

m.—Happy Hour; Cooking and Marcy, Ray Nelson.
p. m.—Ella Dowds, soprano. 130 p. m.—Ella Dowds, soprano.
1:45 p. m.—Alice Evans, talk.
8 p. m.—Fred Tinkl planist.
8:20 p. m.—Ella Dowds, soprano.
8:30—Thomas Houston, tenor.
9 p. m.—Violin, harp and plano.
9:30 p. m.—Margaret MacKenzie, g.
9:40 p. m.—Transcontinental tour. 10 p. m.—Jimmy Shearer, songs. WGCP—NEWARK—252 3-5:45 p. m.—Songs and race results.
WOO—PHILADELPHIA—508

a. m.—Grand organ, 2 (noon)—Luncheon music by Golder Crystal Tea Room Orchestra. 25 p. m.—Grand organ; trumpets. p. m.—Dinner music. WCAU—PHILADELPHIA—278 WCAU-PHILADELPHIA-278
7:30 p. m.—Snellenburg male quartet.
8 p. m.—Plano duets.
8:30 p. m.—Jack and Harry Guth, guitars.
9 p. m.—Songs.
10:30 p. m.—Billy Hayes' Orchestra.
WFI-PHILADELPHIA-395

WIT—PHILADELPHIA—395

1 p. m.—Tea Room Orchestra.

3 p. m.—Mabel Faggen, readings.

3:10 p. m.—Varsity Seven.

3:45 p. m.—Fashion Feature.

6:45 p. m.—Roof garden broadcast.

8-11 p. m.—Prosnram same as WEAF.

WILT—PHILADELPHIA—396

11 a. m.—Organ recital.

WHAR—ATLANTIC CITY—275 m.—Seaside Trio.
p. m.—Book review.
m.—Seaside Trio.

p. m.—Ambassador Concert Orchestra . m .- Organ recital 1 p. m.—Dance music. WGY—SCHENECTADY—380 2 p. m.—Music, one-act play, "Fennel." 2:30 p. m.—Organ recital. 5:30 p. m.—Dinner program. 7:30 p. m.—Mildred Hilton, planiste.

p. m.—Midred Hilton, planiste, p. m.—Travel talk.
30 p. m.—Georgia Minstrel Boys.
1 p. m.—Tupman's Orchestra.
WRW—TARRYTOWN, N. Y.—273 9:05 p. m.—Musical program; scores. 9:40 p. m.—Bible subject. 10:05 p. m.—Renato Amagulitti, barytone 10:20 p. m.—Norman Hastings, flute. 10:40 p. m.—Orchestra. WGR—BUFFALO,—319

6:30-7:30 p. m.—Dinner music. 8-11 p. m.—Program same as WEAF. WTIC—HARTFORD, CONN.—476 6:30 p. m.—Dinner music.
7 p. m.—Frances Nearing, contralto,
8 p. m.—Quartets, organ and orchest . m.—Organ recital. WHAM—ROCHESTER—278 4:30 p. m.—Eastman Theater 6 p. m.—Theater organ.

7:15 p. m.—Dinner concert. 8 p. m.—Theater organ. 8:30 p. m.—Scores; weather; market. . m.—Scores; weather; marke WJAB—PROVIDENCE—306 1:05 p. m.—Biltmore Orchestra.
7:35 p. m.—Music Tawkalog."
8 p. m.—Musical program.
8:30-10 p. m.—Program same as WEAF.

6:30 p. m.—Frogram same as WEAF.

WEEI—BOSTON—349
6:30 p. m.—Big Brother Club.
7:20 p. m.—Lost and Found; scores.
7:30 p. m.—Philipper Bergeron, violinis
8-11 p. m.—Program; same as WEAF.

WEZ—SPRINGFIELD, MASS.—333 7 p. m.—Lenox ensemble.
9 p. m.—Fopular songs.
9:45 p. m.—Carrie Goodell, soprano.
9:30 p. m.—Concert by artists.
10 p. m.—Brunswick orchestra.
WCTS—WORCESTER, MASS—268

TO-DAY

Time Wave P. M. Station, Length. Orchestra.

10:30 a. m.—Radio chats. 5:15 p. m.—Story teller; scores 8-11 p. m.—Program same as

WFBH-NEW YORK CITY-273 o. m.—Orchestra. . m.—Studio programme. . m.—Baseball scores (¼ hourly). 4 p. m.—Baseball scores (% hourly).
4 p. m.—Studio programme.
5 p. m.—Jerry Antone's Orchestra.
6 p. m.—"Shall America Be Blue."
6:15 p. m.—Majestic string ensemble.
7 p. m.—Orchestra selection.

TUESDAY, SEPTEMBER 15

WEDNESDAY, SEPTEMBER 16

WMCA 841 WPG 800 WRW 273

3:00 WEBJ 8:30 WAHG 9:20 WEBJ

Daylight Saving Time

WRC-WASHINGTON-469 m.-Women's hour from WJZ. WAHG-RICHMOND HILL, N. Y.-316 12:30 p.m.-Almon & Bower, yiolin and 10 a. m.—Women's hour from W.
1 p. m.—Organ recital.
2 p. m.—Mayflower Orchestra.
8 p. m.—"Over the Seven Seas."
8:30 p. m.—Shoreham Orchestra.
9:30 p. m.—Musical program.
11 p. m.—Mayflower Orchestra. 12:30 p.m.—Almon & Bower, violin and piano.
7:30 p. m.—Thornton Fisher, sport talk.
7:45 p. m.—Ferdinand Greenwald, pianist.
8 p. m.—Marguerite Behling, soprano.
8:30 p. m.—Smith's Paramount Orchestra.
9 p. m.—Marguerite Behling, soprano.
9:15 p. m.—Southland Dance Orchestra.
10:30 p. m.—Synchrophase Trio.
10:45 p. m.—Stellario Cambria, mandelinist KDKA-PITTSBURGH-306 9:45 p. m.—Old-fashioned barn dance. 11:30 p. m.—Grand Theater concert. WOR-NEWARK-405 WCAE-PITTSBURGH-461 6:45-7-45 a. 4:30 p. m.—Dinner concert. 8-11 p. m.—Program from WEAF.

11 a. m.—Happy hour program.
7 p. m.—Elmer Nippes's Orchestra.

7 p. m.—Elmer Nippes's Orchestra. 7:30 p. m.—Sport oracle: orchestra. 8:15 p. m.—Mrs. J. M. Morris, soprano. 8:30 p. m.—Mrs. J. Morris, soprano. 8:45 p. m.—Mrs. J. Morris, soprano.

9 p. m.—Alice Rinck, violin.
5 p. m.—Mrs. J. Morris, soprano.
6 p. m.—Mrs. J. Morris, soprano.
7 p. m.—John Stahler, tenor.
8 p. m.—Joe Furtner, banjo zither.
8 WGCP—NEWARK.—252

m.—Jane. .—Bob Ward's little Wards.

3 p. m.—Songs; race results. 4:15 p. m.—Clarence Williams Trio.

WFI-PHILADELPHIA-396

1 p. m.—Tea Room Orchestra.

3 p. m.—Recital; talk,

3:45 p. m.—Fashion feature.

6:45 p. m.—Roof garden broadcast,

WIJT—PHILADELPHIA-395

12:05 p. m.—Organ; religious service chestra.
2-3 p. m.—Concert Orchestra; recital.

p. m.—Artist recital.
0 p. m.—Dance Orchestra.
1 p. m.—Organ recital.
WOO—PHILADELPHIA—508

WJAR-PROVIDENCE-306

WBZ—SPRINGFIELD, MASS.—322

WCTS-WORCESTER-268

12 noon-2 p. m.—Luncheon music, 7:15 p. m.—"Story Teller"; scores. 9-10:40 p. m.—Radio industries banquet,

WRC-WASHINGTON-469

to a. m.—Women's nour, from WJZ, 1 p. m.—Organ recital. 2 p. m.—Washington Orchestra. 3 p. m.—United States Marine Band.

WCAP-WASHINGTON-469

WCAE--PITTSBURGH-461

THURSDAY, SEPTEMBER 17

FRIDAY, SEPTEMBER 18

Dance music

Lauria's
Colonial
Polla's
Dance music
Asbury Park
WRW
Dance music
Roseland

Arrowhead Vincent Lopez's

7 p. m.—Dinner concert.
7;32 p. m.—Radio nature story.
9 p. m.—Nora Winton, contraito.
9:30 p. m.—Half hour of Shakespears.
10 p. m.—Lenox Orchestra.

11 a. m. - Grand Organ. 12 noon - Luncheon music

WEDNESDAY

WEAF—NEW YORK CITY—492
6:45-7:45 a. m.—Health exercises.
11 a. m.—Anna Hutter, soprano.
11:10 a. m.—Health talk; songs.
11:35 a. m.—Talk to mothers; songs.
12 m.—Market and weather reports.
4 p. m.—Sadrian String Trio.
4:45 p. m.—Dramatic readings.
6 p. m.—Dinner music.
7 p. m.—Eynagogue services.
7 p. m.—Eynagogue services.
8 p. m.—Foremost Four.
8 p. m.—Foremost Four.
8:30 p. m.—Pooley period.
9 p. m.—Radio industries banquet.
10:40 p. m.—Ipana Troubadours.

WIZ—NEW YORK CITY—455

WJZ-NEW YORK CITY-455 10 a. m.—Woman's hour, 10:40 a. m.—The Herald Tribune Institut

la m.—News. 1 a, m.—News.

115 p. m.—Luncheon, advertising club.

2, 4, 5:20, 8, 10:30 p. m.—News.

1-6 p. m.—Scores and racing (half hourly).

10 p. m.—John Daniel, readings.

120 p. m.—News, scores, racing results.

126 p. m.—Market reports.

150 p. m.—Financial summary. 5:50 p. m.—Financial summary.

8 p. m.—Scores, racing results.

8:10 p. m.—Edison hour.

9:30 p. m.—Edison hour.

9:45 p. m.—Musicale.

9:45 p. m.—Musicale.

10:35 p. m.—Musicale.

4:45 p. m.—Jane.
5 p. m.—Bob Ward's little Wards.
5:15 p. m.—Dick Bernard, songster.
5:30 p. m.—Brown's Orchestra.
6 p. m.—Marie McCristair, soprano.
8 p. m.—Ukulele Lou Hayes.
8:15 p. m.—Lew Pollack, Jack Yellen.
8:30 p. m.—Dick and Flo Bernard, songs.
8:45 p. m.—Marcel Doublier, saxophonist.
9 p. m.—Wm. J. Rietz, songs.
9:15 p. m.—Edgar Duffy, tenor.
9:30 p. m.—Indianans Orchestra.
10 p. m.—Sam Williams, Al Plantodosi.
10:15 p. m.—Polla's Orchestra; songs
WFI—PHILADELPHIA—395
1 p. m.—Tea Room Orchestra. WGBS—NEW YORK CITY—316
10 a. m.—Timely talks with Terese,
10:10 a. m.—Mr. and Mrs. McCrate, bar

10:10 a. m.—Mr. and Mrs. McCrate, tone and pianiste.

10:20 a. m.—Beauty talk; songs.

10:40 a. m.—"Home Decoration"; sor

1:30 p. m.—Scripture reading.

1:35 p. m.—Strand Roof Orchestra.

2:30 p. m.—Radio World's Fair.

3 p. m.—"Vegetables and Flowers."

3:10 p. m.—Paula Fire, soprano.

3:20 p. m.—Paula Rire, soprano.

3:40 p. m.—Ellen Warner, songs.

3:50 p. m.—Paula Fire, soprano.

6 p. m.—Uncle Geebee.

6:30 p. m.—Yerkes's Orchestra.

WHN—NEW YORK CITY—861

WHN-NEW YORK CITY-361 WHN—NEW YORK CITY—361
2:15 p. m.—Clarence Profit, pianist.
2:30 p. m.—Julia O'Brien, soprano.
2:45 p. m.—Carl White's Entertainers.
3:45 p. m.—Jimmy Clarke's Entertainers.
4:15 p. m.—Edith Pollack, reader.
4:30 p. m.—Edith Pollack, reader.
4:45 p. m.—Frank Galassi, pianist.
5 p. m.—Chidren's hour.
7:30 p. m.—Shirley Herman, songs
7:45 p. m.—Frances O'Connor, songs.
8 p. m.—Royal Jazz Band.
8:45 p. m.—Florence Phillips, soprano.
9 p. m.—Edgar Duffy, barytone.
9:15 p. m.—Marconi Brothers, solos.
9:30 p. m.—Kingsley Sisters, singers.
9:45 p. m.—Jack Smith, barytone.
10 pm.—Dance orchestra.

4:45 p. m.—Grand Organ; Trumpets. 7:30 p. m.—Dinner music. 8 p. m.—United States Navy Band. 8:30 p. m.—'Pooley Period.' 9 p. m.—Radio Industries Banquet. 11 p. m.—Dance music. WCAU—PHILADELPHIA—278 8 p. m.—Song recital.

WGY—SCHENECTADY—380 6:30 p. m.—Program for children. 6:45 p. m.—Strand Theater Orchestra. 7:35 p. m.—"Book of Knowledge." WRW—TARRYTOWN—273 10 p. m.—Dance orchestra. 10:30 p. m.—Palisades Orchestra. 11 p. m.—Silver Slipper Revue. WNYC-NEW YORK CITY-526

WRW-TARRYTOWN-275

10:05 p. m.—Nicolas Koenig's Orchestra.

10:30 p. m.—Gordon MacMunn, songs.

10:45 p. m.—Dick Tobin, planist.

11:05 p. m.—Nicolas Kcenig's Orchestra.

WGR-BUFFALO, N. Y.—319

American Bake WNYC—NEW YORK CITY—526

p. m.—Elementary Spanish lessons.
6:30 p. m.—Advanced Spanish lessons.
7 p. m.—Market high spots.
7:10 p. m.—Merrill Hughes's Ramblers.
7:30 p. m.—Police alarms.
8 p. m.—Baseball results.
8:05 p. m.—Rose Savona, soprano.
8:25 p. m.—Concert by artists,
9:45 p. m.—Colice alarms; weather.
10:30 p. m.—Folice alarms; weather.
WEBJ—NEW YORK CITY—273
8:00 p. m.—Melean's dance orchestra. 11 p. m.-1 a. m.—Supper music. WTIC—HARTFORD, CONN.—476

WEBJ-NEW KURK CHIK-Zis
8:00 p. m.—McLean's dance orchestra.
8:40 p. m.—The Roth Trio.
9 p. m.—Thomas Prytherch, tenor.
9:20 p. m.—Virginia orchestra.
WMCA—NEW YORK CITY—341 4:30 p. m.—Eastman Theater Orchestra 6-8 p. m.—Theater organ. 8:30 p. m.—Scores; weather; markets. 11 a. m.—Helen Morris, soprano.
11:15 a. m.—Sally Knickerbocker, "Radgrads of Fashion Fada,"
11:30 a. m.—Helen Morris, soprano.
11:45 a. m.—Snedden Weir, bartione.
12 a. m.—12:30 p. m.—Olcott Vail's esemble. 10 a. m.—Housewives exemange. 1:05 p. m.—Studio program. 7:30 p. m.—Dorothy Hoyle, violinist. 8-9 p. m.—United States Navy Band. 9-10:40 p. m.—Radio industries banquet. WEEL-BOSTON—349
6:30 p. m.—Big Brother Club.
7:20 p. m.—Lost and Found; scores.
7:30 p. m.—C. B. Collins, tenor.
8-11 p. m.—Program same as WEAF.

12 a. m.—12:30 p. m.—Olcott vairs ensemble.
3:30 to 4:30 p. m.—Radio World's Fair.
6 p. m.—Clcott Vail's String Ensemble.
7:30 p. m.—Ernie Golden's orchestra.
8:15 p. m.—Mercedes Posthauer, soprano;
Joseph Haydon, barytone.
8:45 p. m.—Jack Smiles.
9 p. m.—Symphony orchestra.
10 p. m.—Manhattan Serenaders.
10:30 p. m.—Jack Smith, songs.
WENY—NEW YORK CHTY—258

WRNY-NEW YORK CITY-258
12:02 p. m.—Trio.
1 p. m.—Radio industry hour. 1:02 p. m.—Sports forecast.
1:10 p. m.—Studio program.
7 p. m.—Sports results.
7:10 p. m.—Commerce of the day.
7:20 p. m.—Code lesson.
7:35 p. m.—"New Inventions."

7:35 p. m.—"New Inventions,"
7:45 p. m.—Thelma Schiffman, soprano,
8 p. m.—Mario Curci's song series,
8:30 p. m.—Fiction series,
8:45 p. m.—Piano classics.
9 p. m.—"Where Do We Get Off?"
9:15 p. m.—Francine Vyde, soprano,
9:25 p. m.—Architecture,
9:45 p. m.—Chev. de Lancellotti's concert
10:15 p. m.—Biography series.

6:45 a. m.—Health exercises.
8 p. m.—'Foremost Four.''
8:30 p. m.—'United States Navy Band.
9 p. m.—Radio industries banquet.
10:40 p. m.—Ipana Troubadours. KDKA--PITTSBURGH--309 3:30-7 p. m.-Scores. 9:45 p. m.-Hour of Music. WCAE—PITTSBURGH—461
6:30 p. m.—Dinner concert.
7:30 p. m.—The Sunshine Girl,
8:30 p. m.—Pooley period.
9 p. m.—Radio industries program.
11 p. m.—Loew's Aldine Theater.

Asbury Park
Palisades
Arrowhead
William West's
Billy Hayes
Vincent Lopez's
Mayflower

Ernie Golden's Dance music Sterling

MCLean's Smith's Virginia Roseland Manhattan Arcadia Polla's Meyer Davis's Central Park Dance music Vincent Lopes's

8 p. m.—Scores, racing results.
8:10 p. m.—Radio Franks, songs,
8:30 p.m.—U. S. Marine Band.
10 p. m.—Royal Hour of Music.
11:05 p. m.—Jacques Green's Orchestra
with Clark's Hawalians. WOR—NEWARK—405

6:45-7-45 a. m.—Gym class.

2:30 p. m.—Theodor Carmen, pianist.

2:45 p. m.—Emanuel Ritter, tenor.

3 p. m.—Theodor Carmen, pianist.

3:15 p. m.—"Is Thought Inhaled?"

3:30 p. m.—Emanuel Ritter, tenor.

3:45 p. m.—"Is Thought Inhaled?"

3:45 p. m.—Mrs. Sol Marx, contraito.

6:15 p. m.—"Swords Often Mispronounced.

6:17 p. m.—Shelton Ensemble.

7:30 p. m.—Wincent Lopez's Orchestra.

8 p. m.—"Topics of the Day."

8:15 p. m.—Sam Siegel, mandolin.

8:30 p. m.—Suzanne Richmond, soprano.

8:45 p. m.—Sam Siegel, mandolin.

9 p. m.—Harry F. Brewer.

9:30 p. m.—Emilyn Edwards barytone.

9:30 p. m.—Selecting a Career,"

Wadsworth.

9:45 p. m.—Little Symphony Orchestra.

10:45 p. m.—Little Symphony Orchestra.

10:45 p. m.—Little Park Orchestra.

11 p. m.—Central Park Orchestra.

WAAM—NEWARK—263

11 a. m.—Happy hour program.

tenor; Arthur Hunt, barytone; address by the Rev. Albert Cunningham.

10 p. m.—Silvertown Orchestra. 11—12 p. m.—Vincent Lopez's Orchestra. WJY—NEW YORK CITY—405
p. m.—Freddie Rich's Orchestra.
p. m.—'Making a Polo Pony."
p. m.—'Yewish New York Message.'
WGBS—NEW YORK CITY—316

WGBS—NEW YORK CITY—316
10 a. m.—Timely Talks with Terese.
10:10 a. m.—Rose Margetson, soprano.
1:30 p. m.—Scripture reading.
1:35 p. m.—Juliette Strahl, soprano.
2 p. m.—Wm. Mumbrauer, barytone.
2:30 p. m.—Radio World's Fair; interview with Alice Brady; Strand Orchestra.
3 p. m.—'Woman in the Home' hour; songs.

view. 9:10 p. m.—Constitution Day program. 9:30 p. m.—Bohemian Hour. 10:30 p. m.—Arrowhead Dance Orchestra. 10:30 p. m.—Club Royal Orchestra. 10:30 p. m.—Albert West, songa.

10:30 p. m.—Arrowhead Dance Orchestra.

WHN—NEW YORK CITY—361
12:30-1 p. m.—Marsh McCurdy, organist.
3:15 p. m.—Lexington Theater Orchestra.
4:30 p. m.—Ebb Miller, Lewis Piotti, songs.
4:45 p. m.—Ethel Pincus, pianist.
5 p. m.—Children's Hour.
7:15 p. m.—Cecil Kennedy's Quintet.
8 p. m.—Cecil Kennedy's Quintet.
8 p. m.—Ethel West, soprano.
8:45 p. m.—Jinmy Clark's Entertainers.
9 p. m.—Jinmy Clark's Entertainers.
9 p. m.—Jinmy Clark's Entertainers.
10 p. m.—Loew's vaudeville headliners.
WHAM—ROCHESTER—278
4:30 p. m.—Theater organ.
8 p. m.—Theater organ.
8 p. m.—Theater organ.
8 p. m.—Theater organ.
9 p. m.—Scores; weather; market.
WJAR—PROVIDENCE—366
1:05 p. m.—Two Inter West, songs. WNYC-NEW YORK CITY-526

7 p. m.—Market high spots.
7:10 p. m.—Arcadia Orchestra; pol alarms. ms. m.—"Big League Baseball." 8 p. m.—"Big League Baseball."
8:15 p. m.—Arthur Baecht, virtuoso.
9 p. m.—Old Time Telegraphers' banquet.
10:30 p. m.—Police alarms; weather. 6:30 p. m.—Big Brother Club, 7:10 p. m.—Lost and found; scores, 7:30 p. m.—Musicale, 8:11 p. m.—Program same as WEAF. WMCA-NEW YORK CITY-341

WMCA—NEW YORK CITY—341

11 a. m.—Bernard Mann, pianist.

11:15 a. m.—Talk, Bernice Bowser.

11:45 a. m.—Helen Morris, soprano.

12 noon—Olcott Vail's Ensemble.

3:40-4:30 p. m.—Radio World's Fair.

6 p. m.—Olcott Vail's String Ensemble.

7:30 p. m.—Radio World's Fair.

9 p. m.—Asbury Symphony Orchestra.

10 p. m.—Helen Morris, soprano.

10:15 p. m.—Leonard Hoenninger, barytone.

10:30 p. m.—Helen A. Morris, soprano.

10:45 p. m.—Leonard Hoenninger, barytone.

10:45 p. m.—Leonard Hoenninger, barytone.

11 p. m.—12 midnight—Ernie Golden's Orchestra.

WRNY—NEW YORK CITY—258 10 p. m.—Chickering program. 10:30 p. m.—Market report. 10:50 p. m.—Scores; time. WRNY-NEW YORK CITY-258
12:02 p. m.-Trio,
1 p. m.-Radio industry hour. WRC—WASHINGTON—469

10 a. m.—Women's hour, from WJZ.

1 p. m.—Organ recital from the Fire Congregational Church.

2 p. m.—Washington Orchestra.

8 p. m.—Shoreham Hotel Orchestra.

8:30 p. m.—United States Marine Band.

10 p. m.—Royal hour of music.

12:02 p. m.—Trio.

1 p. m.—Radio industry hour.
1:02 p. m.—Sports forecast.
1:10 p. m.—Sports results.
7:10 p. m.—Commerce of the day.
7:20 p. m.—Home science.
7:30 p. m.—Home science.
8:10 p. m.—Concert orchestra.
8:15 p. m.—Lorna Lee, songs.
8:30 p. m.—Concert orchestra.
8:15 p. m.—Lorna Lee, songs.
8:30 p. m.—Radio questions and answers.
8:30 p. m.—Winited States Ms 10 p. m.—Meyer Davis's Ban KDKA—PITTSBURGI 3:30-7 p. m.—Scores.
8:45 p. m.—Constitution Day.
9 p. m.—Forty-second Street Celebration.
10 p. m.—Radio world's fair.
10:15 p. m.—Volga Trio.

WCAE—PITTSBURG 0:15 p. m.—Volga Trio.
0:30 p. m.—Dance orchestra.
WFBH—NEW YORK CITY—273

WFBH-NEW YORK CITY—273
b. m.—Orchestra.
c. m.—Studio program.
c. p. m.—Mrs. Owen Kildare, "Radio pr. m.—Silvertown Orchestra.
c. p. m.—Silvertown Orchestra. 3:45 p. m.—S. L. Neidlinger, Emilio Roxas. m.—Baseball scores (quarter hourly).
m.—Baseball scores (quarter hourly).
m.—Leo Ford's Entertainers.
p. m.—Helene Koster, contralto.
p. m.—Knickerbocker Hospital talk.
m.—Milton Yokemann, tenor.
p. m.—Jack Fagan's radio frolic.
m.—Jack Smith, barytone. 7:30 p. m.—Blucher Trio.
WOKO—NEW YORK CITY—233 WORO—NEW YORK CHTY—Z55
7 p. m.—Program from Radio Show.
8 p. m.—Rose Gonchar, planist.
8:15 p. m.—Anita Priest, contralto.
8:35 p. m.—Amphions.
9 p. m.—Ted Newkirk's Band.
9:15 p. m.—Ray Maher, barytone.
9:45 p. m.—Amphions.

7:45 p. m.—Saure Soys.

8 p. m.—The Newkirk's Band.

9:15 p. m.—Ray Maher, barytone.

9:45 p. m.—Amphions.

WBBR—STATEN ISLAND, N. Y.—244

8 p. m.—Instrumental trio.

8:10 p. m.—Mrs. Benjamin Brown, soprano.

8:20 p. m.—Sunday school lesson.

8:40 p. m.—Songs and trio.

WAHG—RICHMOND HILL, N. Y.—316

12:30 p. m.—Joe Zimmerman.

12:30 p. m.—Joe Zimmerman.

WJZ—NEW YORK CITY—455 WAHG—RICHMOND HILL, N. Y.—236
12:30 p. m.—Joe Zimmerman.

WBOQ—RICHMOND HILL, N. Y.—236
9 p. m.—Mischa Tulin, pianist.
9:15 p. m.—Arthur Feldman, monologist.
9:30 p. m.—James Savell, barytone.
9:45 p. m.—Von Der Heide, La Ruffa,
8ongs.

11-12 p. m.—Bosser, Max.

WJZ—NEW YORK CITY—455
10 a. m.—Women's program.
11 a. m.—News.
7
7 p. m.—Landbassador Trio.
2, 4, 5:20, 8, 10:25 p. m.—News.
4:10 p. m.—John Daniel, readings.
5:26 p. m.—John Daniel, readings.
5:26 p. m.—Market reports.
5:50 p. m.—Financial summary.
7 p. m.—Lafayette Orchestra.
8:10 p. m.—Scores; racing results.
8:10 p. m.—Scores; racing results.
8:10 p. m.—Reith McLeod, planist.
8:30 p. m.—Colgate Trio.
10:20 p. m.—Ben Glaser's Orchestra.
WJJ—NEW YORK CITY—405
7:30 p. m.—Imm Abrams's Orchestra.

Dance Orchestras for This Week

Ben Glaser's
Dance music
Jack Albin's
Dance music
Vincent Loper's
Dance music
Dance music WJZ WOO WEAF WLIT WGR WRNY WRC WHN SATURDAY, SEPTEMBER 19

Slater's
Asbury Park
Schwab
Dance music
Dance music
J. Knecht's
Vincent Lopez's
Dance music
Ernie Golden's
Dance music
Crandall's
Dance music
Ferrucci's

THURSDAY

WOR—NEWARK—405
6:45, 7:15, 7:45 a. m.—Gym classes.
2:30 p. m.—Frances Pehl, planist.
2:45 p. m.—George Little, "The Maitese
3 p. m.—George Jessel, songs.
3:30 p. m.—Frances Pehl, planist.
3:45 p. m.—Frances Pehl, planist.
6:15 p. m.—Words Often Mispronounced
6:17 p. m.—Shelton Ensemble WJZ-NEW YORK CITY-455 . m.—Woman's hour.
a. m.—News.
5 p. m.—Book review.
m.—Nathan Abas's Orchestra.
, 5:20, 8, 11 p. m.—News.
p. m.—Scores and racing (half hour
p. m.—News, scores, racing,
ip. m.—Market reports.
) p. m.—Financial summary. WAAM—NEWARK—263
11 a. m.—Happy hour.
WGCP—NEWARK—252
3 p. m.—Songs; race results.
4 p. m.—Paul Denniker's Orchestra.
5 p. m.—Jane.
5 p. m.—Jane.
6 p. m.—Theo. Alban, tenor.
WOO—PHILADELPHIA—508
11 a. m.—Grand organ.

p. m.—Dinner music. WCAU—PHILADELPHIA—278 WCAU-PHILADELPHIA—278
6:30 p. m.—Billy Hayes's Orchestra.
7:30 p. m.—Song recital.
8 p. m.—Song recital.
19:30 p. m.—Frank Cooke, songs.
10:30 p. m.—Eddie Malle, Danny Doug with Clark's Hawaiians.

WEAF—NEW YORK CITY—492
6:45—7:45 a. m.—Health exercises.
11 a. m.—12 noon—'Housewives Hour,"; 9:30 p. m.—Song recital.
8 p. m.—Song recital.
8 p. m.—Song recital.
8 p. m.—Song recital.
9 p. m.—Market and weather reports.
4 p. m.—David Dunning, soprano.
4:30 p. m.—A. Wayne, songs.
4:45 p. m.—Book review, John Farrar.
6 p. m.—Dinner music.
7 p. m.—Mid-week services; Louis Caton, tenor; Arthur Hunt, barytone; address ture.

WIIT—PHILADELPHIA—389
12:05 p. m.—Organ; Concert Orchestra.
2-3 p. m.—Concert Orchestra; recital.
4:30 p. m.—Artist recital.
7:30 p. m.—Dream Daddy.
WHAR—ATLANTIC CITY—275 2 p. m.—Seaside Trio.
7:30 p. m.—Lecture period.
8 p. m.—Seaside Trio.

i.—Studio concert.

WPG—ATLANTIC CITY—300

m—Morton luncheon music. WPG—ATLANTIC CITY—300
1:30 p. m.—Morton luncheon music.
4:30 p. m.—Trio.
6:30 p. m.—"Billy" Rocap, "Sports."
6:40 p. m.—Scores; organ recital.
7 p. m.—Ambassador dinner music.
8:15 p. m.—Organ recital.
9:15 p. m.—Traymore Concert Orchestra. m.—Dance orchestra. WGY—SCHENECTADY—380

WEEI-BOSTON-349

WBZ—SPRINGFIELD, MASS.—333 m.—Leo Reisman's Ensemble.

p. m.—Leo Reisman's Ensemble. 15 p. m.—Roger Gray, comedian. p. m.—McEñelly's Singing Orchestra. 30 p. m.—Song recital. p. m.—Chickering program.

WCTS-WORCESTER-268

KDKA-PITTSBURGH-309

WCAE-PITTSBURGH-461

FRIDAY

WEAF—NEW YORK CITY—492 6:45-7:45 a. m.—Health exercises.

11 a. m.-12 noon—Women's program music and speakers.
12 noon—Market and weather reports.
4 p. m.—New York Society Trio.
4 t.45 p. m.—'The Slippery Eel.''
6 p. m.—Dinner music.

7 p. m.—Gene Ingraham's Orchestra. 7:30 p. m.—Story teller. 7:45 p. m.—Sadie Eskin, ptanisth 8 p. m.—The Happiness Boys.

7:30 p. m.—Irwin Abram's Orchestra. 8:30 p. m.—Current topics. 10 p. m.—Monte Carlo Virginians. WGBS—NEW YORK CHTY—316

WGBS—NEW YORK CITY—316

10 a. m.—Timely talks with Terese.

10:10 a. m.—Windled Burke, soprano.

1:30 p. m.—Scripture reading.

1:36 p. m.—Jerome Tyrrell, Irish program

2 p. m.—Eleanor Van Der Kar, soprano.

2:30 p. m.—Radio world's fair; KiddiKlub; Leroy Montesanto, tenor.

3 p. m.—Hazel Lee, readings.

3:10 p. m.—Midred Dittman, soprano.

3:20 p. m.—"Better Gardens"; songs.

3:40 p. m.—"Better Gardens"; songs.

6 p. m.—Uncle Geebee.

6:30 p. m.—Jule Anzel's Orchestra.

7 p. m.—"What's Your Radio Problem?"

7:10 p. m.—Jule Anzel's Orchestra.

WEBH—NEW YORK CITY—273

2 p. m.—Eddie Meyer's Orchestra.

3 p. m.—Studio program.

? p. m.—Eddle Meyer's Orchestra.
1 p. m.—Studio program.
1:45 p. m.—Marion Doran, soprano.
1 p. m.—Baseball scores (¼ hourly).
1:30 p. m.—Katherine Connolly, soprano.
1:46 p. m.—Murray Schwartz, planist,
1 n. m.—Billy Johnson's Orchestra.

10 p. m.—Royal hour of music. 11 p. m.—Meyer Davis's Band.

m.—"Sports," Bill Wathe WAAM—NEWARK—263

3 p. m.—Wolhan ...

6 p. m.—Uncle Geebee.

6:30 p. m.—Organ recital.

6:30 p. m.—Organ recital.

6:30 p. m.—Organ recital.

6:30 p. m.—Dinner program.

7:30 p. m.—Organ recital.

7:35 p. m.—WGY book chat.

7:45 p. m.—WGY book chat.

7:45 p. m.—WGY orchestra

8:30 p. m.—United States Army Band.

10 p. m.—Royal Hour. 10:03 p. m.—Dance orchestra.
11:15 p. m.—Donald Flamm, critic.
WYNC—NEW YORK CITY—526 6 p. m.—Elementary French lessons. 6:30 p. m.—Advanced French lessons. 7 p. m.—Market high spots. 10 p. m.—Royal Hour. 11:30 p. m.—Organ recital. WRW—TARRYTOWN, N. Y.—273 8:30 p. m.—Mildred Dornstreich, violinis 8:30 p. m.—University Quartet. 9 p. m.—May Breen, Peter De Rose. 9:30 p. m.—Colonial Dance Orchestra. 10:30 p. m.—Police alarms; weather. WAHG—RICHMOND HILL, N. Y.—316 12:30 p. m.—Groen and Perry, dulcimer, piano.

8 p. m.—Arnold Koch, cellist.

8:15 p. m.—Samuel Gray, barytone.

8:30 p. m.—Richard Mayne, "Speech."

8:45 p. m.—Arnold Koch, cellist.

9 p. m.—Frank Lauria's Orchestra.

10 p. m.—Synchrophase Trio.

10:15 p. m.—The Davison Sisters.

10:30 p. m.—Thornton Fisher.

10:35 p. m.—Serenaders Plectrum Quint

10:45 p. m.—John Finnegan, tenor.

WOR—NEWARK—405

6:48-7:15-7:45 a. m.—Gym class WJAR.—PROVIDENCE—306

D. m.—Twin Elm Orchestra.

D. m.—George Dion, solos.

n.—Concert artists.

D. m.—Silvertown Orchestra.

WOR—NEWARK—405
6:45-7:15-7:45 a. m.—Gym class.
2:30 p. m.—William Burke, tenor.
2:45 p. m.—Ida L. Groeber, planist.
3 p. m.—Professor J. P. Santamarina
"Across the Andes to Chile."
2:15 p. m.—Tenor: piano solos.

Shontz.

10:05 p. m.—Frank Ochs, tenor.

10:15 p. m.—Marconi Brothers, solos.

10:30 p. m.—Roseland Dance Orchestra.

11:30 p. m.—Alabam Orchestra.

12 midnight—Silver Silpper Revue.

WRNY—NEW YORK CITY—258

WRNY—NEW YORK CITY—258

12:02 p. m.—Trio.
1 p. m.—Radio industry hour.
1:02 p. m.—Sports forecast.
1:10 p. m.—Studio program.
7 p. m.—Sports results.
7:10 p. m.—Commerce of the day.
7:20 p. m.—Code lesson.
8 p. m.—Grand opera.
8:30 p. m.—Thow to Rid Insect Pesta."
8:45 p. m.—DeMacchi Opera.
9:45 p. m.—Commerce and Culture."
10 p. m.—Studio feature.

p. m.—Dance music.

WEBJ—NEW YORK CITY—273

b. m.—Blenheim Theater Ensemble.

WEBJ—NEW YORK CITY—273
7 p. m.—Blenheim Theater Ensemble,
7:30 p. m.—Mardi Gras program.
8 p. m.—Philip Krumholz, tenor.
8:20 p. m.—Norman Hennefeld, pianist.
8:30 p. m.—Mardi Gras program.
WMCA—NEW YORK CITY—341
11 a. m.—A. V. Llufrio, pianist.
11:15 a. m.—Sneddqn Weir, barytone.
11:45 a. m.—Talk, Betty Brainerd.
12 noon—Olcott Vall's Ensemble.
3:30 p. m.—Radio world's fair.

130 p. m.—Shelton ensemble.

p. m.—Shelton ensemble.

WAAM—NEWARK—263

1 a. m.—Happy hour; cooking school.

p. m.—Danny Hope's Boys.

7:30 p. m.—Sport Oracle; boys. 7 p. m.—Danny Hope's Boys.
7:30 p. m.—Sport Oracle; boys.
8:15 p. m.—Hilda Kay, contralto.
8:30 p. m.—Andrew Hays, tenor.
8:40 p. m.—H. Walrath, cellist.
8:55 p. m.—Artists.
9:30 p. m.—Transcontinental tour.
9:50 p. m.—Florence Yordy, soprano.
WGCP—NEWARK—252
3-6 p. m.—Yord; and instrumental s

race results.
p. m.—Steele and Heageny, composers. race results.

8 p. m.—Steele and Heageny, composer 8:15 p. m.—Lillian Gordone, contralto... 8:30 p. m.—Hock and Jerome. 8:45 p. m.—Paolo del Pino, tenor. 19 p. m.—Jack Smith. 9:15 p. m.—Sarah Summers, whistler. 9:15 p. m.—Moe Mann, barytone. 9:45 p. m.—Pola's Orchestra; songs. WFI—PHILADELPHIA—395

1 p. m.—Tea Room Orchestra. 3 p. m.—Beauty talk; songs. 3:45 p. m.—Beauty talk; songs. 3:45 p. m.—Fashion feature. 6:45 p. m.—Roof garden broadcast. WLIT—PHILADELPHIA—395

WIAT—PHII/ADELPHIA—396
al 2:35 p. m.—Concert orchestra; playlet,
4:30 p. m.—Dance music.
7:30 p. m.—Dream Daddy,
8:15 p. m.—Arcadia Concert Orchestra,
10 p. m.—Welch's Minstrels.

-Dance Orchestra. p. m.—Dance music.

WOO—PHILADELPHIA—508

a. m.—Grand organ.

noon—Luncheon music. 4:45 p. m.—Grand organ; trumpets 7:30 p. m.—Dinner music. Mildred Witham, contralto.

p. m.—Dance music. WCAU—PHILADELPHIA—278 n. m.—Junior Choir (25 voices). 7:30 p. m.—Junior Choir (25 voices).

p. m.—Songs.

p:30 p. m.—Rennie Cormack, songs. 10:30 p. m.—Relinie 10:30 p. m.—Jack Myers's Orchestra. WPG—ATLANTIC CITY—300 3:30 p. m.—Dance orchestra.
6:40 p. m.—Scores; organ recital.
7 p. m.—Trio dinner music.
9 p. m.—Traymore Concert Orchestra.
10 p. m.—Steeplechase Orchestra. 10 p. m.—Steephonnes 10:30 p. m.—Dance music. WHAR—ATLANTIC CITY—275

2 p. m.—Seaside Trio. 7:30 p. m.—Fashion review. 8 p. m.—Seaside Trio. (130 p. m.—Fashion review.

8 p. m.—Seaside Trio.

11:15 p. m.—Strand organ recital.

WGY—SCHENECTADY—380

2 p. m.—Music; household talk.

6:50 p. m.—Sunday School lesson.

7 p. m.—Strand Theater Orchestra.

7-46 p. m.—Talk, "Resuscitation."

8 p. m.—Frogram from Temple Be

Eineth.

10:30 p. m.—Drama "Kindling."

WEW—TARRYTOWN, N. Y.—273

9:05 p. m.—Musical program: scores

WEW—TARKTTOWN, N. X.—27:
9:05 p. m.—Musical program; scores,
9:40 p. m.—Almo Entertainers,
10:05 p. m.—WRW Orchestra,
10:30 p. m.—Almo Entertainers,
11:05 p. m.—WRW Orchestra,
WGB BUFFALO—319. 6:30-7:30 p. m.—Dinner music. 9 p. m.—Concert. 9:30-10:30 p. m.—Musical program.

9:30-10:30 p. m.—Musical program.

11 p. m. 1 a. m.—Supper music.

WTIC—HARTFORD, CONN.—476

6:30 p. m.—Young People's period.

7 p. m.—Dinner music.

7:30 p. m.—Song recital.

8:30 p. m.—B. Knox, barytone; quartef.

9:25 p. m.—Readings and musical settir.

10:05 p. m.—Dance music.

2:11:30 p. m.—Popular half hour.

WHAM—ROCHESTER, N. Y.—278
10 p. m.—Eastman Theater Orchestra.
p. m.—Theater organ.
p. m.—Eastman Theater organ. 30 p. m.—Scores; weather; market. WJAR-PROVIDENCE—306

10 a. m.—Housewives! Exchange.
1:05 p. m.—Woodstock entertainers.
2 p. m.—Alice Keyes, story teller.
8:15 p. m.—Beethoven Quartet; vocal and 8 instrumental solos.
p. m.—"Maine Hour."
p. m.—Biltmore Orchestra.
WEEL—BOSTON—349

6:30 p. m.—Big Brother Club.
7:20 p. m.—Lost and Found; scores.
7:30 p. m.—"Four Merry Milkmen."
8: 8 p. m.—Musicale.
8:30 p. m.—Garden talk; quartet.

WHN—NEW YORK CITY—361
2:15-3:15 p. m.—Musical program.
3:45 p. m.—Musical program.
4:15 p. m.—Musical program.
5 p. m.—Children's hour.
7 p. m.—Children's hour.
7;30 p. m.—Burr McIntosh, philosopher.
8 p. m.—Leroy Montesanto, tenor.
8:15 p. m.—Francine Vyde, soprano.
8:30 p. m.—Pollack and Yellen, songs.
8:45 p. m.—Evelyn Ryan, pianist.
9 p. m.—William's Radio Trio.
9:45 p. m.—Florence Patti, soprano.
10 p. m.—"Storage Batteries," H. I WBZ-SPRINGFIELD, MASS,-333 m.—Dinner concert,
m.—Herbert Boardman, organist,
p. m.—Copley Plaza Orchestra,
m.—Exposition Orchestra.
WCTS—WORCESTER—268 wcrs—wcrester—2 0:30 a. m.—Radio chat; music. 2-2 p. m.—Luncheon music. :15 p. m.—Story teller; scores. n.—Concert. WCAP—WASHINGTON—469 6:45 a. m.—Health exercises. 9 p. m.—Organ recital. 10:15 p. m.—Wardman Park Trio. p. m.—Dance program.

KDKA—PITTSBURGH—309

SATURDAY

3:30-7 p. m.—Scores. 9:45 p. m.—Mandolin Sextet.

WEAK—NEW YORK CITY—492
6:45-7:45 a. m.—Health exercises,
4-5 p. m.—Rickett's Dance Orchestra.
6 p. m.—Dinner music.
7 p. m.—Wild New York City."
7:15 p. m.—Allan Harris, banjoist.
7:45 p. m.—Allan Harris, banjoist.
8 p. m.—Crescent Male Quartet.
8:15 p. m.—Eaul Paniagua, planist.
8:30 p. m.—Crescent Male Quartet.
8:45 p. m.—United States Army Band.
10:15 p. m.—Pattison Coates, barytone.
10:25 p. m.—Parnassus Trio.
10:40 p. m.—Pattison Coates, barytone.
10:50 p. m.—Parnassus Trio.
11-12 p. m.—Vincent Lopez's Orchestra.
WJZ—NEW YORK CITY—455

8 p. m.—Panip Allaman, St. 20 p. m.—Norman Hennefeld, pianist.

8:30 p. m.—Mardi Gras program.

WMCA—NEW YORK CITY—341

11 a. m.—A. V. Llufrio, pianist.

11:15 a. m.—Sneddon Weir, barytone.

11:45 a. m.—Sneddon Weir, barytone.

11:45 a. m.—Talk, Betty Brainerd.

12 noon—Olcott Vail's Ensemble.

13:30 p. m.—Radio world's fair.

15:20 p. m.—Scores and racing (half-hourly).

15:20 p. m.—News; scores; racing results.

15:20 p. m.—Market reports.

16:30 p. m.—Market reports.

16:50 p. m.—Market reports.

17:45 p. m.—Josephine Evans, contraito.

17:45 p. m.—Josephine Evans, contraito.

17:45 p. m.—Josephine Evans, contraito.

17:45 p. m.—Joseph Knecht's Orchestra.

18:10 p. m.—Hardman hour; Paloff's Orchestra.

19:46 p. m.—Scores; racing results.

10:50 p. m.—Market reports.

10:50 p. m.—News; scores; racing results.

10:50 p. m.—Market reports.

10:50 p. m.—Market reports.

10:50 p. m.—Market reports.

10:50 p. m.—News; scores; racing results.

10:50 p. m.—News; scores; racing results.

10:50 p. m.—News; scores; racing results.

10:50

10:40 a. m.—Fashion Quizz, Mme. Hall Deane.

1:30 p. m.—Scripture Reading.

1:35 p. m.—Marjorie Harris, soprano.

2 p. m.—Rhea Benoit, pianist.

2:30 p. m.—Arthur Hofman's Serenaders.

3 p. m.—Dick Konter's Ukelele Club.

3:20 p. m.—Spanish Lessons.

3:30 p. m.—Dick Konter's Ukelele Club.

6 p. m.—Uncle Geebee.

6:30 p. m.—"The Dulcimerians."

7 p. m.—Sarah Sommers, whistler.

7:10 p. m.—"The Dulcimerians."

7:30 p. m.—Sylvia Miller, soprano, Ukelele Club.

Club.
p. m.—Florence Donovan, soprano; Anna
Berger, violinist. Berger, Violinist.

50 p. m.—Carmine Coppola, flutist.
p. m.—Dr. Carl Tannert, Elsa Brigham,
Frederick Seifert.

30 p. m.—Warner's Theater program. WRNY-NEW YORK CITY-258

8.15 p. m.—Morton Gould, planist.

8.15 p. m.—Morton Pioture Series.

8.15 p. m.—Studio feature.

9.15 p. m.—Mother Stoner's Series.

10 p. m.—Radio World's Fair.

12-1 a. m.—DX Hound Hour; dance chestra.

WNYC-NEW YORK CITY-526 7 p. m.—Dance program; Police Alarms.
8 p. m.—Baseball results.
8:05 p. m.—Herman Ohl, barytone.
8:20 p. m.—Two-piano recital.
8:40 p. m.—Max Wechsler, violinist.
9 p. m.—Florence Milligan, soprano.
9:30 p. m.—Police Quartet.
10:10 p. m.—Song Recital.
10:30 p. m.—Police alarms; weather. WFBH-NEW YORK CITY-273

WFBH—NEW YORK CITY—273
2 p. m.—Sunnybrook Orchestra.
3 p. m.—Bert Lowe's Entertainers.
4 p. m.—Baseball scores (¼ hourly).
4:15 p. m.—Montana Rambiers.
5:15 p. m.—Glorio Russo, soprano.
5:30 p. m.—Jack Rafferty, recitations.
5:45 p. m.—Francine Vyde, soprano.
6 p. m.—Harold Loomis's Orchestra.
7 p. m.—Southern Serenaders.
11:30 - m.—Bronx program. WOKO-NEW YORK CITY-233

WMCA—NEW YORK CITY—341
con—Olcott Vail's String Ensemble. WMCA—NEW YORK CITY—341
12 noon—Olcott Vail's String Ensemble.
3:40-4:30 p. m.—Radio World's Fair.
6 p. m.—Olcott Vail's String Ensemble.
7 p. m.—The Amphions.
8:15 p. m.—Ukelele Bob MacDonald.
9 p. m.—Asbury Dance Orchestra.
11-12 p. m.—Ernie Golden's Orchestra.
WBBR—STATEN ISLAND, N. Y.—244
8 p. m.—Fred Ehrenberg, musical saw. 8 p. m.—Fred Ehrenberg, musical saw, 8:10 p. m.—L. Marion Brown, soprano, 8:20 p. m.—Bible questions and answers, 8:45 p. m.—Soprano and musical saw, 8:50 p. m.—Fred Ehrenberg, musical saw, WAHG—RICHMOND HILL, N. Y.—316

12:30 p. m.—Musical program.
12 midnight-2 a. m.—Dance music.
WB0Q—RICHMOND HILL, N. Y.—236
9:30 p. m.—Armand De Cecare, songs.
9:45 p. m.—Joe Zimmerman, planist.
WOR—NEWARK—405
6:45-7:15-7:45 a. m.—Gym class.
2:30 p. m.—Mrs. Ermoloff, soprano; Willard Robison songs.
3:30 p. m.—Al Wilson's Playmates.
6:15 p. m.—"Words Often Mispronounced."
6:17 p. m.—Shelton Ensemble.
7:15 p. m.—"Sports." Bill Wathey.
7:30 p. m.—Zit's Orchestra.
8 p. m.—Robt, Ballin, Oscar Race, plane
duo.

duo. 8:15 p. m.—Mischa Goodman, violinist. 8:30 p. m.—Robt. Ballin, Oscar Race, pia: 8:30 p. m.—Robt. Ballin, Oscar Race, pla duo. 8:45 p. m.—Archie Slater's Orchestra. 9:30 p. m.—Mischa Goodman, violinist. 9:45 p. m.—Serenaders' Quintet. 10:15 p. m.—'Madelaine Ceres, pianiste. 10:30 p. m.—Serenaders' Quintet. 10:45 p. m.—Sol Sabino, mandolin. 11:05 p. m.—Madelaine Ceres, pianiste. WAAM—NEWARK—263 11 a. m.—Happy Hour.

WAAM—NEWARK—203

11 a. m.—Happy Hour.
7 p. m.—Jack Wheaton's Trio.
7:30 p. m.—Grace Racaneille, Irma Weiss.
8 p. m.—Alice Lauri, soprano.
8:15 p. m.—Jolly Bill Steinke.
8:35 p. m.—Alice Lauri's Trio.
9 p. m.—Estrid Christiansen, soprano.
9:20 p. m.—Schwab Serenaders.
10:20 p. m.—Hartley Joy Boys.
WGCP—NEWARK—252

WGCP—NEWARK—252
3 p. m.—Songs; race results.
3:45 p. m.—Andy Razaf, yodeling kid.
4 p. m.—Johanna Cohen, trio.
4:15 p. m.—Charles Rust, Bernard Henricson, banjoists.
4:30 p. m.—Della Riordan, barytone.
4:45 p. m.—Indianan's Orchestra. WFI-PHILADELPHIA-395

p. m.—Tea room orchestra.
p. m.—Zapp Zither Players; talk.
45 p. m.—Roof garden broadcast.
p. m.—Musical program. 12:05 p. m.—Organ recital; orchestra. 2-3 p. m.—Orchestra; recital. 4:30 p. m.—Dance music.

wife—Philadelphia—508

p. m.—Grand opening 1925 and 1926

season; address by Ellis Gimbel; concert quartet; symphony orchestra; Germantown Theatre; tea room orchestra; "movie" interview; University of Pennsylvania feature and other features. WGY-SCHENECTADY-380 10 s. m.—Program from 'nyneth.
9:25 p. m.—Dance program.

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store on the premises.

after extended visits to the Frost factory at Elkhart, Ind., and Walter Nusbaum, head of the the Runzel - Lenz factory at Walthall Radio Stores, has leased Chicago. Several new items have HE appearance of radio shop present day set that causes you to the entire fifth floor of the buildbeen developed by N. C. Schellening at 233 Spring street for use as ger, chief engineer of Herbert H. administration offices and various other departments, including revery shortly. ceiving and shipping, set repair and set service. It is understood Arthur D. Lord of the De Forest also that his plans call for the Company was elected president of establishment later of a retail the R. P. A. Laboratories, Inc., at prosaically colored but important

a meeting of the directors of that organization in New York on De- have been made solid black for cember 15. The Yorkville Radio Company at Louis Mandel of Metro Electric red and black, and coils can be envy. 147 East Eighty-sixth street has re- Company of Chicago was elected purchased in whatever color haporganized its service department, vice-president and E. A. Tracey of pens to suit the buyer's temperawhich will be headed by G. F. the Northern Manufacturing Company was elected treasurer of the course, no novelty and in this case Petry. Mr. Petry was formerly pany was elected laboratories.

with the Wilson Research Labora-Mac Weisberg, manager of the here the varieties of color have intories and the Radio Dealers Supdell Radio Stores, has announced be secured.

Pat Kiley, Eastern district sales his engagement to Miss Hannah manager for Herbert H. Frost, Inc., Boxer. Miss Boxer has been Mr. and Runzel-Lenz Electric Manufac- Weisberg's secretary for several attention to pleasing the eye while turing Company, returned to his of- years.

Tungar

Trickle Chargers,

Tungara Amp. \$8.39

Amy Set

the buyer of parts. Of course, this has been done to a certain extent a set, but until a very recent date all that one asked of the interior of a set was in the line of performance. Now that the superior manufacture of parts insures realize that the next demand of

to Please Eyes

years suddenly appear in bright

Trend of Public's Mind.

eading on the part of the manu- beauty parloring of parts may facturers; they have very concrete serve no practical purpose, but it examples of the public's trend of sure adds to the enjoyment of ownmind. When doffed its swaddling ing a set. If your auto was just clothes and became a public com- a motor on wheels and your home modity the old sets consisting of a furnace surrounded by four walls separate boxes containing respect and covered by a roof, you wouldn't tively R. F., detector and audio take much pride in them, and then units, soon became obsolete. You you might think of yourself as may remember what an amazing dressed in flour sacks, which would appearance some of these old probably serve the purpose as well imers presented, with binding as your tailored clothes, but would posts located conspicuously on the you enjoy it? Personally, I'm root-

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TUBES 65c HAMMARLUND

STORAGE "A'

WESTERN

ELECTRIC

CONTROLIT

fice, 30 Church street, New York city. Wednesday. December 7, Radio Parts Designed sections, but they were practically unanimous in their super-abungers. Sets rapidly evoluted over a By JOHN N. SENNOTT. . period of a few years into the windows is gradually chang- look twice before finding any con-

boxes and troop forth from facseason than might at first be suptories savoring of every type of deposed. Spots of color intrigue the sign from Egyptian, Renaissance curiosity and upon closer examination prove to be the heretofore modern skyscraper. You can have cozy little cabinets to fit your inner parts of a set. Sockets that favorite nook, or imposing consoles to make the neighbors swoon with

Speakers have changed enormously. Gone are the unsightly horns, to be replaced by the much the colors play an important part more presentable cones and more in tracing out circuits, but even recently the built in exponential horn which we do not see but purchasing department for the Mo- creased and any tint or shade may which overwhelms us with its volume and clarity. In the cone The radio industry has reached speakers overzealous manufacthe stage where it can turn its turers have in many cases gone to appealing to the good judgment of the other extreme and perpetrated the buyer of parts. Of course this tion, many times to the detriment with the external appearances of of the performance of the speaker. Fortunately, this is not a drawback to most of the other parts of a set.

> tion in the "innards" of receivers. Some parts, such as variable conperformance, the manufacturers densers, must of necessity surrender more or less to purely the public will be for attractively utilitarian design, but there remain by-pass condensers, transformers, chokes, &c., which could have more attractive coverings This decision requires no mind without sacrificing efficiency. This front panel and innumerable con- ing for the manufacturers who are trols much in evidence. Of course, going to the trouble to doll up their all sets were not built in separate products.

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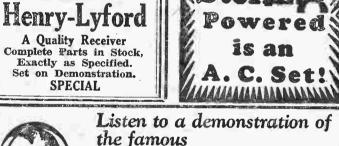
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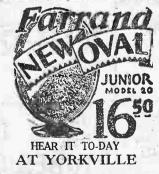
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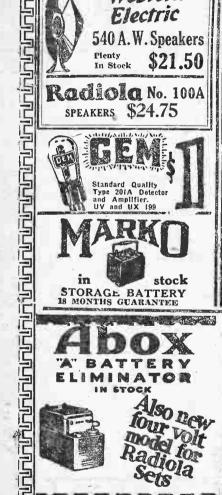


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# The Sun's Daily Broadcasting Programs for the Week End

TO-DAY Meters, Left. Kilocycles, Right. 526-WNYC-570

7:00 P. M.-Children's Christmas pro-7:30 P. M.—Police alarms. 7:35 P. M.—Double Quartet. 8:15 P. M.—Harmony Trumpeters. 8:30 P. M.—"Christmas Greetings," Mayor James J. Walker. 8:45 P. M.—Harmony Trumpeters. 9:00 P. M.-"Dickens's Christmas Car-

ols," Harriette Weems. 9:20 P. M.-Herman Neuman, pianist. 9:35 P. M.—Police alarms. 9:40 P. M.—Christmas greetings from WNYC.

492-WEAF-610 12:00 Noon-Christmas carols. 12:15 P. M.-St. Paul's Church carols. 1:30 P. M .- Palais D'Or Orchestra. 2:30 P. M.—Hofbrau Orchestra. 3:00 P. M.—Parnassus Trio. 4:00 P. M.-Manhattan Trio. :30 P. M.-Creole Six. 4:45 P. M.-Leslie Davis, chimes. 5:00 P. M.—Scott's Orchestra. 6:00 P. M.—Waldorf-Astoria Orchestra 7:00 P. M.—South Sea Islanders. 7:30 P. M.—The High Jinkers. 9:00 P. M.—Fascinating Fiddling. 9:30 P. M.—The Tuneful Troupe. 10:00 P. M.—A Christmas carol. 10:30 P. M.—Dr. Cadman's Christr

carol concert. 454-WJZ-660 12:00 Noon-Luncheon music. 1:00 P. M.—Yoeng's Orchestra. 2:00 P. M.—Trinity Church chimes. 2:30 P. M.—Children's carol services. 3:30 P. M.—Studio program. 4:15 P. M.—Roxanne Williams, singe 4:30 P. M.-Venetian Gondoliers. 5:30 P. M.—Studio program. 6:00 P. M.—Friedman's Orchestra. 6:55 P. M.—Summary of programs. 7:00 P. M.—Astor Orchestra. 8:00 P. M.—RCA. Hour, New York

Symphony. 9:00 P. M.—Philco Hour. 10:00 P. M.-Keystone Duo with Balladeers.

10:30 P. M.—Dorothy Howe and string trio.

11:00 P. M.—Slumber music.

10:30 A. M.—Housewives program.

10:30 A. M.—Housewives program.

10:00 P. M.—Dinner music. 12:05 A. M.-Midnight mass fron Shrine of the Sacred Heart.

422-WOR-710 2:30 P. M.-Esther Jaffe, cellist; Gertrude Bartel, pianist. 3:00 P. M .- Christmas carol. 3:30 P. M.-Roseland Orchestra 4:00 P. M.-Villa Venice Orchestra. 6:15 P. M.—Shelton ensemble. 6:30 P. M.—Iutuk—the Eskimo. 6:35 P. M.-Don Bruton, tenor. 6:50 P. M.—Shelton ensemble. 7:30 P. M.—Villa Venice Orchestra. 8:00 P. M.—Session chimes; "The Other Wise Man," Dr. Frederick Paulding. 8:15 P. M.—"Old Xmas."

9:00 P. M.-Bamberger Little Sym 10:00 P. M.-Christmas Eve in Grange 11:00 P. M.—Carr's Orchestra. 11:30 P. M.-Ye Christmas Carol.

395-WHH-760 12:00 Noon-Women's hour. 4:30 P. M.—Varsity Collegians. 5:30 P. M.—Studio broadcast. 6:00 P. M.—The Soudanians. 7:00 P. M.—Level Club ensemble. 7:30 P. M.—Artists revue. 9:00 P. M.—Sterling Trio. 9:30 P. M.—Week-enders. 370-WMCA-810

5:30 P. M .- Eaton's Orchestra.

singer.
9:50 P. M.—Dr. A. Slaten, "The Meaning of Christmas."
10:05 P. M.—Robert McClelland, tenor. 11:00 A. M.-Beauty talks. 12:00 Noon-Where to go to-night.
12:30 P. M.-Luncheon hints. 10:20 P. M.—Anna Curtis, "The Quakers, Peace and Good Will."
10:30 P. M.—Marial Nelda, diseuse. 1:00 P. M.-Littmann's hour. 2:00 P. M.-Financial advice 3:00 P. M.—Sarnoff's Boulevardiers. 3:30 P. M.—Equitable Melodians. 10:45 P. M.—Lydia Mason, pianist. 11:00 P. M.—Variety hour. W \_Selbert Fursters. M.—Littmann's Entertainers. 236-WMSG-1270 5:00 P. M.-Deutch Bros. Early Birds. 1:00 P. M.-Salvation Army Children's

8:00 P. M.—Christmas carols. 8:30 P. M.—Mae Sims, songs. 316-KDKA-950 8:55 P. M.—Bearingov readings 5:55 P. M.—Theatrical calendar 9:00 P. M.—Ridgewood Grove bouts. 11:00 P. M.—McAlpin Orchestra. 6:00 P. M.-Dinner concert. 7:00 P. M.-U. of P. address 7:15 P. M.-Radio Club meeting. 11:40 P. M.-McAlpin Orchestra. 7:30 P. M.-Concert 8:00 P. M.-R. C. A. program. 9:00 P. M.-Philco hour. 370-WLWL-810 6:00 P. M.-Edwin Breen, barytone 333-WBZ-900

studio ensemble. 6:45 P. M.-"Christmas Stories," Al-6:30 P. M .- Morey's Orchestra. 6:55 P. M.—Santa Claus. 7:30 P. M.—Concorde Quartet. 8:30 P. M.—Musical program. fred Young. 7:00 P. M.-Adrian da Silva, tenor. M.-Theatrical Review. 9:00 P. M.—Christmas party. 7:45 P. M.-Popular Airs 12:00 Midnight-Midnight Mass. 10:05 P. M.—Musical program. 11:00 P. M.—Statler Orchestra. 349-WGBS-860 337-WCAU-889 1:30 P. M.—Scripture Reading. 1:35 P. M.—Elizabeth Haupt, con 12:30 P. M.-Luncheon music.

5:00 P. M.—This and That Revue. 6:30 P. M.—Golden Dragon Orchestra. 7:15 P. M.—What's It All About? 1:45 P. M.—Sidney Smith, tenor. 2:05 P. M.—Elizabeth Haupt, con-7:30 P. M.—Cathay Orchestra 8:00 P. M.—Carnay Orchestra. 8:00 P. M.—Thirty Minutes in France. 8:30 P. M.—Pennsylvania Orchestra. 9:00 P. M.—Concertiers. 9:30 P. M.—Musical Chefs. 2:20 P. M.-Sidney Smith, tenor. 2:25 P. M.-Harry Harrison, "Clown of 2:45 P. M.-Rose Jonas, pianist. 10:00 P. M.—Myers's Architects. 10:30 P. M.—Piccadilly Orchestra. 5:30 P. M.—Tang's Orchestra. 6:00 P. M.—Uncle Geebee. 366-WEEI-820 8:00 P. M .- Vanderbilt Trio. 11:30 P. M.-The Night Before Christ

2:00 P. M.-Musical program. 6:00 P. M.-Waldorf-Astoria Orches 326-WPCH-920 5:30 P. M.—Lido Venice Orchestra. 4:00 P. M.—Musical program. 4:15 P. M.—Arlie Carroll, pianist. 4:30 P. M.—Harandranath M. a i t r 7:30 P. M.—Automobile Club program 7:32 P. M.—Parker House Orchestra. .- Damrosch's Orchestra

9:00 P. M.-Old Gold on Broadway. 5:00 P. M.-Shaw and Rosenthal. 5:45 P. M.-Spanish lessons. 405-WFI-740 6:00 P. M.—Bert Lowe. 6:30 P. M.—Chinaland Orchestra. 1:00 P. M.—Tea Ensemble. 3:00 P. M.—Harmony Trumpeters. 10:00 P. M.—Mickey Addig, songs.

0:15 P. M.—Fred Ehrenberg.

0:30 P. M.—Lillian Trotter, pianist. 3:20 P. M.—Christmas music 3:45 P. M.-Anderson's Orchestra. '. M.—Adelphia Orchestra. 7:00 P. M.—Daily Toy Tales. 8:00 P. M.—Christmas Carok :00 P. M.-Piotti and Hardy. 30 P. M.-Clark and Miller. P. M.-Russell Herd, composer. 0:30 P. M.-Christmas Carols.

316-WRNY-920

Slizabeth Haupt, con-8:00 P. N.-High Jinkers, 16:20 P. L.-Christmas carola. 316-WKNY-920 303-WGR-990

11:15 A. M.-Christmas songs for Children.
11:30 A. M.—Shoppers' guide.
12:05 P. M.—Joe Davis, songs.
12:20 P. M.—Maurine Ricker, songs.
12:35 P. M.—Eddie Jarvis, songs. 12:50 P. M.-Piano recital.

7:00 P. M.—Yoeng's Orchestra. 7:30 P. M.—Dickens's Christma Carols. 7:45 P. M.—Hazel Kirk, violinist. 8:00 P. M.—Guild Singers. 8:35 P. M.—Germas Christmas carols. 9:00 P. M.—Anne Marentze, soprano; Virginia Fickling, contralto. 9:15 P. M.—Vincent Bach, trumpeter. 9:30 P. M.—Male quartet. 9:45 P. M.—Ralph Cristman, planist.

309-WABC-970 1:00 P. M.-Barclay ensemble. 7:30 P. M.-Program summary. 7:31 P. M.-King's Orchestra. 8:30 P. M.—Barclay Orchestra. 9:00 P. M.—Mayflower Orchestra. 10:01 P. M.—Waldorf-Astoria Orches-11:00 P. M.-Beaux Arts Orchestra.

294-WGL-1020 10:15 A. M.-Brunswick hour. 11:15 A. M.—School review. 2:00 P. M.—Al Carnival, mandolin. 2:15 P. M.—General hints.
2:30 P. M.—Rebecca Brookmeyer, 2:45 P. M.-Henrietta Scarpato, so-

prano.
3:00 P. M.—Arlie Carroll, pianist.
3:25 P. M.—Bamboo Inn Orchestra.
6:00 P. M.—Sport talk. 6:05 P. M.-Chamber music trio. 6:45 P. M.-Yolande Langworthy, con-7:00 P. M.-American Society for the

Promotion of Aviation.
7:30 P. M.—Arrowhead Inn Orchestra. 8:15 P. M.-Christmas program. 268-WGCP-1120 3:30 P. M.-Cooperative program.

4:00 P. M.—Joy hour. 10:00 P. M.—Christmas carols, 10:45 P. M.—Paramount trio. 11:00 P. M.-Studio program. 268-WAAM-1120 12:35 P. M.-Luncheon music. 9:00 P. M.-Organ recital.

246-WAAT-1220 6:45 P. M.-Sport talk. 7:00 P. M.—Union City Four. 7:30 P. M.—Electric ferries. 7:30 P. M.—Christmas carols. 8:00 P. M.-Piano master

8:30 P. M.-Edith Von der Lieth, soprano. 8:45 P. M.-Walter O'Callaghan, barytone, 246-WEVD-1220

1:00 P. M.-Anna Worth, soprano. 1:15 P. M.—George Rael, bass. 1:30 P. M.—Anna Worth, soprano. 1:45 P. M.—George Rael, bass. 2:00 P. M.—Michel Ingerman, pianist. 12:35 P. M.—Chester Gaylord, pianist. 2:00 P. M.—Michel Ingerman, pianist. 2:15 P. M.—Robert Yurran, barytone. 2:30 P. M.—Michel Ingerman, pianist. 2:45 P. M.—Robert Yurran, barytone. 3:00 P. M.—Bob and Ben Linder.

3:30 P. M .- Elsie Duffeld, soprano. 3:30 P. M.—Elsie Duffeld, soprano.
3:45 P. M.—C. Clark, Spirituals.
4:00.P. M.—Mary Abbott, "The Purpose of Christmas."
4:15 P. M.—Walter Plock, barytone.
4:30 P. M.—Elsie Duffeld, soprano.
4:45 P. M.—Walter Plock, barytone. 5:00 P. M.-Royal Vagabond Orches

6:30 P. M.-Story hour. tra. 9:00 P. M.—Justine Roberts, imper-8:00 P. M.—Musical units. 10:00 P. M.—Dr. James Woods, tenor sonations. 9:20 P. M.—McAllister Coleman, "La George Doescher, barytone, 11:00 P. M.—Jack Horn, cellist; Marbor Looks at the Week."

9:35 P. M.—Elsie Restell, Liedergaret Horn, pianist. 12 Midnight—Baker Orchestra. 12:30 A. M.-Palace Theater features.

469-WRC-640 12:30 P. M.-Waldorf - Astoria Orches 2:00 P. M.-Organ recital. 6:00 P. M.-Waldorf - Astoria Orche

7:00 P. M.-Bible talk. 7:15 P. M.—Mayflower Orchestra. 8:00 P. M.—R. C. A. hour. 9:00 P. M.—Philco hour. 10:00 P. M.-Palais d'Or Orchestra. 476-WSB-630 6:30 P. M.-Santa Claus.

7:00 P. M.—Sunday school lesson. 7:30 P. M.—Davis's Orchestra. M.-R. C. A. program. 9:00 P. M.-Philco operetta 10:30 P. M.-Christmas program. 11:45 P. M.-Concert. 337-WSM-880

7:00 P. M.—Bedtime story. 7:15 P. M.—Dinner concert. 8:00 P. M.—R. C. A. hour. 9:00 P. M.—Phileo hour. 10:00 P. M.—Barn dance. 384-KGO-780 10:15 P. M.—Sport talk. 11:00 P. M.—R. C. A. hour. 12:00 Midnight—Philco hour. 1:00 A. M.—N. B. C. program. 2:00 A. M.—St. Francis Orchestra. 326-KOA-920

12:00 Midnight-Dance orchestra. 422-KPO-710 12:00 Midnight-N. B. C. program. 384-KTHS-780 9:00 P. M.—Musicale. 9:30 P. M.—Christmas carols.

10:00 P. M .- Dance frolic. 526-KYW-570 7:00 P. M.-Bedtime story. 7:32 P. M.-Dinner concert. 8:00 P. M.—RCA Hour. 9:00 P. M.—Phileo Hour. 10:00 P. M.—Congress carnival. 11:32 P. M.—Kentucky Serenaders.

405-WCCO-740 7:15 P. M.—Dinner concert. 8:00 P. M.—RCA Hour. 9:00 P. M.—Philco Hour. 10:00 P. M.-Fireside Philosophies. 10:15 P. M. - Minneapolis Sympho 11:15 P. M. Long's Orchestra.

576-WDAF-

19:40 A. M.-Nighthawh

12:00 Noon-Christmas carols. 6:00 P. M.-Santa Claus. 6:30 P. M.—Dinner music. 7:30 P. M.—High Jinkers. 11:00 P. M.—Dance orchestra 278-WHAM-1080 6:45 P. M.-Dinner music. 7:30 P. M.—Two-piano recital. 8:00 P. M.—R. C. A. hour. 9:00 P. M.—Philco hour.

10:00 P. M.—Organ recital. 11:05 P. M.—Barrett's Orchestra. 265-WICC-1130 9:00 A. M.-Morning Glory hour. 2:00 Noon-Luncheon music. 484-WJAR-620 2:00 Noon-Christmas carols.

12:15 P. M.—Christmas services, 7:50 P. M.—No-Klank Pathfinder, 8:00 P. M.—R. C. A. hour, 9:00 P. M.—Providence Christmas Eve civic celebration. 10:00 P. M.—Christmas Eve program. 405-WLIT-740 12:00 Noon-Organ recital.

12:20 P. M.—Book review. 12:30 P. M.—Symphonic Orchestra. 2:00 P. M .-- Arcadia Orchestra. 2:30 P. M.-Hofbrau Orchestra. 4:30 P. M.-Mohawk hour. 5:30 P. M.—Children's hour. 7:30 P. M.-Sylvania Orchestra. 461-WNAC-650 1:35 A. M.—Organ recital. 2:00 Noon-Colonial concert.

12:30 P. M.-Sweethearts of the Air. M.-Klayman's Orchestra. . M .- Luncheon concert. 2:00 P. M.—Service program. 4:00 P. M.—Dok's Sinfonians. 5:00 P. M.—Le Paradis Band. 6:00 P. M.—Scout Campfire. 6:30 P. M.—Stevens's Orchestra. 7:00 P. M.—Dok's Sinfonians. 7:30 P. M.—Better business talk. 7:40 P. M.—Lady of the Ivories. 7:50 P. M.—"New England History," Willard DeLue. 8:00 P. M.-Carol service. 9:00 P. M.—Pearl's Orchestra. 9:30 P. M.—Community Christmas

Sing. 10:30 P. M.—Le Paradis Band. 11:05 P. M.—Community Christmas Sing. 349-WOO-860

11:00 A. M.--Organ recital. 2:00 Noon-Luncheon music. 5:15 P. M.—Organ recital. 7:30 P. M.—Children's half hour. 273-WPG-1100 6:45 P. M.-Organ recital.

7:05 P. M.—Dinner music. 9:00 P. M.—Norman Brokenshire. 9:30 P. M.—Concert. 10:00 P. M.—Studio gragram. 10:30 P. M.—Casino Orchestra. 11:00 P. M.—Christmas carols. 11:40 P. M.—Solemn midnight mass.

7:30 P. M.—Bancroft Orchestra. 8:00 P. M.—RCA hour. 10:00 P. M.-Bancroft Orchestra. 535-WTIC-560 6:30 P. M.-Dinner music.

7:10 to 11:40 P. M.—Musical program. 416-WLIB-720 8:00 P. M.—RCA hour. 9:00 P. M.—Philco hour. 8:30 P. M.-Drake Ensemble, 12:00 Midnight—The Hoodlums, 12:10 A. M.—Drake Orchestra. 10:00 P. M.-Bond Orchestra 500-WFAA-600 428-WLW-700 6:00 P. M.-Santa Claus.

6:50 P. M.—Theatrical reports. 7:00 P. M.—Smith-Kasson Orchestra. 8:00 P. M.-R. C. A. program. 9:00 P. M.—Philco hour. 10:02 P. M.—Recital. 11:00 P. M.—Thies's Orchestra. 448--WMAQ-670

416-WGN-720

S THEODORE GRANIK - W.G.B.S.

6:00 P. M.-Topsy-turvy time. 7:00 P. M.-Organ recital 7:30 P. M.—Dinner concert. 9:00 P. M.—Radio photologue. 9:30 P. M.-Christmas poems. 9:30 P. M.—Christmas pounds 9:40 P. M.—Song cycle. 10:15 P. M.—Chicago Theater revue. 11:00 P. M.—Christmas program. 1:00 A. M.—Chimes. 1:15 A. M.—Stevens Orchestra. M.—Chimes. 6:45 P. M .- Chimes concert.

3:00 P. M.-R. C. A. program. 9:00 P. M.-Philco hor 361-WSAI-830 6:45 P. M.-Radio chime concert 6:55 P. M.—Bridge game reports. 7:15 P. M.—Norine Gibbons, songs. 7:30 P. M.-Fiorito's Orchestra. 8:00 P. M.—Gloides Culpepper, 8:30 P. M.—Gloides Culpepper, 8:30 P. M.—Hill Billy program, 9:01 P. M.—Old Gold program, 10:00 P. M.—Palais d'Or Orchestra, 11:00 P. M.—Miller's Orchestra,

400-WTAM-750 6:00 P. M.-Dance orchestra. 7:30 P. M.—Studio program. 8:00 P. M.—Pocohontas Indi 9:00 P. M.-Willard Cavaliers. 10:00 P. M.-Wandering Minstrels 11:00 P. M.-Dance orchestra. 353-WWJ-850 3:00 P. M.-Musical program.

5:00 P. M.—Concert orchestra. 8:30 P. M.—Old Gold on Broadway. 10:00 P. M.-Feature program. 357-CFCA-840 8:00 P. M.-Shoe talk. 9:00 P. M.—Instrumental ensemble 357-CKCL-840 5:15 P. M.—Santa Claus. 7:00 P. M.—Ford Motors program.

2. M. Interdenominational

SUNDAY

526-WNYC-570 7:56 P. M.-Christmas Greetings from 8:00 P. M.—Christmas Carols. 492-WEAF-610 12:00 Noon-Capitol Symphony Orches

CECILIA HANSEN - WOA PHILCO PLAYERS - WJZ

ATWATER MENT QUARTET - WEAR

3:00 P. M.-Toung People's Confer- 7:00 P. M.-McAlpin Orchestra. ence. 4:00 P. M.—Dr. Cadman. 5:30 P. M.-Crosley Moscow Art Orchestra.
6:30 P. M. Stetson Parade. 7:20 P. M.—Major Bowes Family. 9:00 P. M.—"Our Government," David

9:15 P. M.—Atwater Kent hour. 10:15 P. M.-Biblical Drama. 454-WJZ-660 8:30 A. M.-Christmas carol singing. 9:00 A. M.—Children's hour. 10:00 A. M.—Special Christmas concert 1:00 P. M.—The Mediterraneans. 2:00 P. M.—The Roxy Stroll.

3:00 P. M.—Jospe Woodwind ensemble 3:30 P. M.—Devora Nadworney, contralto; string trio. 3:55 P. M.—St. George vesper service 5:30 P. M.—National radio vespers. 6:30 P. M.-New York Trio. 6:55 P. M.—Summary of programs. 7:00 P. M.—Organ recital. 7:30 P. M.—Musical literature. 8:15 P. M.—Talk. 9:15 P. M.—Paula Heminglaus, con-

tralto, with muted trombone. 9:30 P. M.—Vibrant melodies. 9:45 P. M.—Utica Jubilee Singers. 10:00 P. M .- Utica Jubilee Singers. 10:15 P. M .- Don Amaizo

422-WOR-710 3:00 P. M.-J u d s o n's Symphon Hour. 4:00 P. M.—Voorhees's Band. 7:45 P. M.—Levitow's musicale 8:45 P. M.-Sessions chimes: Randall Hargreaves, "Song Discourse."

9:00 P. M.—Emerson Hour. 9:30 P. M.-American singers. 10:00 P. M.-Columbia Hour.

395-WHN-760 1:00 P. M.-Three Little Sachs. 1:30 P. M.-Musical reproductions. 2:00 P. M.—Symphony orchestra.
5:00 P. M.—Roseland Orchestra.
5:30 P. M.—Le Vita ensemble.
6:00 P. M.—Gott's Orchestra. 7:00 P. M.-Keen's ensemble. 10:10 P. M.-Celebrity hour. 1:30 P. M.-Frivolity Club Orchestra 2:00 Midnight-Will Oakland's Orches

tra. 395\_WOAO\_766 11:00 P. M.—Calvary morning services 3:00 P. M.—Inspiration hour. 9:30 P. M.—Jack's Club Orchestra. 10:00 P. M.—Blue Hills Orchestra. 10:30 P.M. Snedden Weir, barytone 7:30 P. M.-Calvary evening services. 395-WPAP-760 9:00 A. M.-Children's hour.

10:25 A. M.-Choral singers. 370-WMCA-810 10:30 A. M.-Bible lecture 0:30 A. M.-Technical entertainers. 11:00 A. M.—Fred Twaroschk, tenor. 11:20 A. M.—Studio orchestra. 1:00 A. M.—Christian Science services 12:15 P. M.—Solow soloists.

1:00 P. M.—Finkenberg's entertain-2:00 P. M.-Watchtower Quintette. 2:00 P. M.—Watchtower Quintette 2:20 P. M.—Choral Singers. 2:30 P. M.—"Glad Tidings for People," W. Woodworth. 3:00 P. M.—Choral Singers. 2:00 P. M.-Herbert's Diamond 3:00 P. M.-Fox Fur Trappers. 3:15 P. M.—Fred Twaroschk, tenor. 3:30 P. M.—Bible Instruction. 3:45 P. M.—Wilchtower Quintette. 5430 P. M.—Chinatown services. 6:00 P. M.—Roemer's Homers.

All Programs in East - Standard Time.

MARGARET ILLINGTON-WEAF. 7:30 P. M.—McAipin Orenestia. 7:30 P. M.—Talk, Charles A. Levine. 9:15 P. M.—German hour. 10:15 P. M.-Christmas cheer.

349-WGBS-860 9:15 P. M.-Piano-String Quartet. 326-WPCH-920 7:15 P. M.-Luigi Constantino, planist. 7:45 P. M.—Francesca Catalina, so-prano; Eumenio Blanco, bary-

8:15 P. M.—Musical program. 8:30 P. M.—Prince Joveddah, philoso 4:00 P. M.-Hymn sing. 246-WAAT-1220 9:00 A. M.—Diversified entertainment pher. 9:00 P. M.-William Crawford, "Remi-5:30 P. M.—Musicale. niscences of a Reporter.

10:00 P. M.—Studio program.

10:30 P. M.—Musical program. 6:00 P. M.-Dinner music. 7:00 P. M.—Christmas carols. 7:30 P. M.-Radio topics 7:45 P. M.—Wandering Quartet. 8:15 P. M.—Esperanto lessons. 11:30 P. M.-Caravan Club Orchestra.

326-WRNY-920 8:30 P. M.-Leila Canne's hour. 11:00 A. M.-St. Matthew's Lutheran 9:30 P. M.—Dance music. 10:00 P. M.—Humorous recordings. Church services.
3:00 P. M.—Gould Quintet. 10:15 P. M.-Musical program. 3:45 P. M.-Christmas message to sail-4:00 P. M.-H. Chatfield, barytone 12:00 Noon-Weissmantle's Entertain 4:15 P. M.-Monticello Players. 1:00 P. M.-Mr. and Mrs. Chatterbox. 5:00 P. M.-Tremantano's Orchestra

Herbert Rawll.

268-WAAM-1120

268-WNJ-1120.

10:45 A. M.-Central Presbyterian

6:31 P. M.-Orange Jubilee Quartet.

7:30 P. M.—Evangel hour. 8:30 P. M.—Rev. Merrill MacPherson

256-WBBR-1170.

3:00 P. M.-Hawaiian Serenaders.

6:45 P. M .- Robert Treat Trio.

9:20 P. M.-Christmas Hymns.

10:00 A. M.-Studio orchestra.

11:00 A. M.-Presbyterian Church

3:00 P. M.-City Temple services.

5:30 P. M.-Organ recital.

6:15 P. M.-Forum.

Marguerite Raymond, soprano.
6:00 P. M.—"Little Journeys Into
Great American Industries,"
Herbort Paril 2:00 P. M.-Debs String Quartet. 2:20 P. M.—Prof. Jeannette M.

"Revolution and Poetry."
2:40 P. M.—Debs String Quartet.
2:45 P. M.—Norman Thomas, "Cl
mas Without Peace."
3:00 P. M.—Debs String Quartet. 309-WABC-970 10:50 A. M.-West End Presbyteria 3:30 P. M.—Talk, Dr. Harry Ward. 3:45 P. M.—Debs String Quartet. Church services.
7:00 P. M.—Synchrophase hour.
8:00 P. M.—Presbyterian Church 236-WBNY-1270

swers.

246-WGBB-1220

246-WEVD-1220

2:00 P. M.-Grace Gospel Church ser vices.
2:10 P. M.—Sacred songs.
2:15 P. M.—Dr. Thomas Little. 2:15 P. M.—Dr. Thomas Little. 2:30 P. M.—Organ recital. 2:45 P. M.—Dr. Thomas Little. 3:00 P. M.—Danceland Orchestra. 3:30 P. M.—Webb's Orchestra. 4:00 P. M.-Brunswick Balke Collan

der period. 4:30 P. M.—Herman Danofsky, pianist. 4:45 P. M.-Al Chaskin, ter :10 P. M.-Cantor Joseph Shlisky. 5:20 P. M.—Mizrach male quartet. 5:30 P. M.—Bella Katz, violinist. 5:40 P. M.—Margaret Stern, soprano. 5:50 P. M.—Cantor Joseph Shlisky. 6:00 P. M.—Christmas carols. 316-KDKA-950

0:45 A. M.-Telechron time. 11:00 A. M.-First Baptist Church se vices. 2:00 P. M.—Roxy's Stroll. 3:00 P. M.—Santa talks to the kiddle 4:00 P. M.—Organ recital. 7:00 P. M.-Calvary Episcopal Church

services. 8:15 P. M.—Collier's hour. 9:15 P. M.—Vibront melodies. 9:30 P. M.-Concert. 9:45 P. M.-Utica Jubilee Singers. :15 P.M.-Don Amaizo. 11:00 F. M.-Messages to the Far North 333-WBZ-900

3:30 P. M.—The Rosentainers. 5:30 P. M.—Radio vespers. 6:30 P. M.—Musical program. 7:00 P. M.—Blue and Gold hour, Dos ton. 7:50 P. M.—Statler ensemble. 8:15 P. M.-Talk. 9:15 P. M.—Christmas concert. 10:05 P. M.—Musical program. 337-WCAU-889

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2:00 P. M.-Undenominational Church services. 2:15 P. M.—"The Day When Wise Men Were Humbled," J. W. Stockwell. 2:40 P. M.-Concert. 2:50 P. M.-Sermon. 3:00 P. M.-Symphonic hour. 4:00 P. M.—Concert band. 5:00 P. M.—Tenth Presbyterian Church

services. 6:05 P. M.—Golden Dragon Orchestra. 6:30 P. M.—Concert. 7:00 P. M.—Mort Melodians. 7:30 P. M.—One-Hour Ardy. 8:00 P. M.—Nimble Thimble Boys. 8:30 P. M.-Bonwit Teller Ensemble. 9:00 P. M.-Emerson Effervescent

9:30 P. M.—Columbia hour. 10:30 P. M.—American Singers. 11:00 P. M.—Organ recital. 366-WEEI-820 10:50 A. M.-Morning church services. 11:55 A. M.—Symphonic concert. 1:15 P. M.—Parker Orchestra. 2:00 P. M.-Sager's hour. 3:00 P. M.-Radio chat.

4:00 P. M.-Men's Conference 5:20 P. M.—Men Schneider.
5:20 P. M.—Crosley Moscow Orchestra.
6:30 P. M.—Stetson parade.
7:30 P. M.—La Touraine Orchestra.
9:10 P. M.—Masterpiece planist.
9:16 P. M.—Atwater Kent hour.
10:20 P. M.—Radio review. 405-WEI-740

10:20 A. M.-Arch Street Methodist Church services. 4:30 P. M.—Chapel services. 5:30 P. M.-Crosley Moscow Orchestra. 9:15 P. M.-Atwater Kent hour. 303-WGR-990

10:45 A. M.-Presbyterian Church serv-5:30 P. M.-Crosley Moscow Orchestra. 6:30 P. M.—Stetson parade. 7:30 P. M.—Presbyterian Church serv-9:00 P. M.—"Our Government," David Lawrence. 9:15 P. M.—Atwater Kent hour.

380-WGY-790 M.-Candle services. 10:30 A. M.—Christmas services. 3:30 P. M.—Eastman Symphony Or 4:00 P. M.-Men's Conference. 5:30 P. M.-Crosley hour. 6:30 P. M.—Stetson parade. 7:20 P. M.—Major Bowes Family.

9:00 P. M.-"Our Government," David 9:15 P. M.—Atwater Kent hour. 10:15 P. M.-Biblical drama. 278-WHAM-1080

9:00 A. M.-Family Wership hour. 7:00 P. M.—Edward Pedrette, pianist.
7:15 P. M.—Concert Trio.
7:30 P. M.—Wrap and Pedrette, pianist.
7:15 P. M.—Concert Trio.
7:30 P. M.—Wrap and Pedrette, pianist.
7:30 P. M.—Musical Milestones.
7:30 P. M.—National Radio Vespers. 6:30 P. M.-Fireside Forum. M.-Eastman hour. 8:00 P. M.-Tommy Weir, tenor.

8:00 P. M.-Edward Pedrette, pianist. 8:30 P. M.-Bible Questions and An-9:15 P. M.-Vibrant Melodies. 9:30 P. M.-Paula Hemminghaus, c 10:40 A. M.-Freeport Methodist Church 9:45 P. M.-Jubilee Singers.

265-WICC-1130 10:50 A. M.-Park Street Church vices. 2:00 P. M.—Carr's Entertainers. 3:30 P. M.-Christmas Play. 4:00 P. M.-Christmas Story. 484-WJAR-620

5:30 P. M.-Crosley Moscow Art Or- 10:45 P. M.-Moon Magic. chestra. 6:30 P. M.—Stetson parade. 6:30 P. M.—Stetson parade.
7:20 P. M.—Major Bowes Family.
9:00 P. M.—"Our Government," David Lawrence.

10:00 A. M.—English roundelays.
11:00 A. M.—Variety program.
12:00 Noon-Luncheon music.

2:30 P. M.-Arcadia Orchestra. 461-WNAC-650 0:45 A. M.-Cathedral Church services 12:15 P. M.—Organ recital. 1:15 P. M.—Radio chat. 1:30 P. M.-Concert orchestra. 2:30 P. M.-Knickerbocker Quartet. 3:00 P. M.-Columbia program. 4:00 P. M.-Columbia program. 5:00 P. M.-Christmas party. 7:00 P. M.-Concert orchestra. 7:30 P. M.—Evening services. 9:00 P. M.—Columbia program.

349-WOO-860 10:45 A. M.-Bethany Presbyterian se 2:30 P. M.—Sunday school. 6:00 P. M.—Organ recital by Maitland

273-WPG-1104 3:15 P. M.—Organ recital. 4:15 P. M.—Community recital. 9:10 P. M.—Ambassador Orchestra. 10:00 P. M.-Musicale. 517-WTAG-580

4:00 P. M.-Men's Conference. 5:30 P. M.-Crosley Symphony, 6:30 P. M.-Stetson parade M.-Major Bowes Family. 9:00 P. M .- "Our Government," 535-WTIC-560

5:30 P. M.-Crosley Moscow Art Or chestra. 6:30 P. M.—Stetson parade 7:20 P. M.—Major Bowes Family 9:00 P. M.—David Lawrence, P. M.-Major Bowes Family. 500-WFAA-600

1:00 P. M.-The Mediterraneans

7:00 P. M.-Bible class. 8:15 P. M.-Atwater Kent hour. 10:15 P. M.-Victor Oakley, barytone. 12:00 Midnight-Dance orchestra. 480-WRC-640 11:00 A. M.-Charch services.

3:00 P. M.-Interdenominational Church services.
4:00 P. M.—Washington Cathdral ser11:15 A. M.—In the studio.
11:30 A. M.—Women's hour. 2:00 P. M.-Tune Inn. 5:30 P. M.-Crosley Moscow Art Or- 4:00 P. M.-Frolic. chestra. 6:30 P. M.-Stetson Parade. 7:20 P. M.-Major Bowes Family.

11:00 A. M.—Beauty talks. 9:00 P. M.—'Our Government," David Lawrence.
9:15 P. M.—Atwater Kent hour.

12:00 Noon—Where to go to-night.
12:30 P. M.—Luncheon hints.
1:00 P. M.—Fox Fur Trappers. 1:30 P. M.—Bradley's Funsters. 2:00 P. M.—Astor Chapeaux Enter-10:15 P. M.-Biblical diama. 416-WSB-630 6:00 P. M.-Vesper services. 7:20 P. M.-Major Bowes's Family. 9:00 P. M.-"Our Government," David

353-WWJ-850

MONDAY

492-WEAF-610

10:00 A. M.-English rondelays.

11:00 A. M.-Variety program.

12:00 Noon-Luncheon music. 1:00 P. M.-Dance music.

quartet. 4:00 P. M.—Christmas moods.

5:00 P. M.—Concert orchestra

quartet. 4:00 P. M.—Christmas moods.

5:00 P. M.-Concert orchestra.

6:00 P. M.-Manger Orchestra.

6:55 P. M.—Summary of programs; 7:00 P. M.—Klein's Shoemakers.

10:00 P. M.-Neo-Russian String Quar

10:30 P. M.-Shoppe and Grosvener.

422-WOR-710

11:00 P. M.-Slumber music

6:45 A. M.-Colgate hour.

7:15 A. M.-Colgate hour.

7:45 A. M.—Colgate hour. 8:00 A. M.—Sessions chimes.

8:25 P. M.-Krueger's Lieders.

395-WHN-760

9:00 P. M.-Musical album.

1:10-P. M.-Joe Lane, songs.

5:00 P. M.-Uncle Robert.

6:00 P. M.—String quintet. 6:30 P. M.—Keen's ensemble.

7:00 P. M.-Movie Club.

2:45 P. M.—Vaudeville. 4:30 P. M.—Loew's Orchestra.

5:30 P. M .- Ann Lang, contralto

5:45 P. M.-Joe Sherman, tenor.

8:60 P. M.-Seville Troubadours.

11:00 P. M.—Sampson and Woldf. 11:15 P. M.—Vaudeville.

11:30 P. M.-Eflver Slinger

10:00 A. M.-Pure food hour.

Orchestra.

7:30 P. M.—Roxy and His Gang. 9:00 P. M.—Rise and Shine.

9:15 P. M.—Atwater Kent hour.

tainers. 2:30 P. M.—Equitable Melodians. 3:00 P. M.—Hudson Bay Seals. 3:30 P. M.—Littmann's Entertainers. Lawrence. 4:00 P. M.-Sarnoff Boulevardie 9:15 P. M.—Atwater Kent concert. 337-WSM-880 5:00 P. M.-Selbert Fursters. 5:30 P. M.—Studio program. 5:45 P. M.—Bearingoy Readings. 5:50 P. M.—Theater Review. 5:30 P. M.-Crosley Moscow Art Orchestra. 7:20 P. M.—Major Bowes Family. 9:15 P. M.—Atwater Kent Hour. 8:00 P. M.-Christian Science Lecture.

.-Jewish period. 384-KGO-780 10:15 P. M.-Rainbow Inn Entertain-10:35 P. M.—Calvary Presbyterian Church services 11:00 P. M.-McAlpin Orchestra. 1:00 A. M.- Great Moments of His-349-WGBS-860. tory. 5:30 P. M.—Christmas poems. 5:45 P. II.—Rose Saulnier, contralto; 526-KYW-570

5:30 P. M.—Vesper services. 8:15 P. M.—Talk. 9:17 P. M.—"Good Reading," C. Per-M. Drie Mack, soprano. 6:00 P. M. Uncle Gee Bee. 326-VTPCH-920 10:15 P. M.-Don Amaizo. 7:30 P. M.-Hammer's Artists. 8:00 P. M.—Margaret Kopekin, pianist, 8:30 P. M.—Venetian Orchestra. 9:00 P. M.—Musical program, 405-WCCO-740 6:50 P. M .- Church of Christ services. 8:15 P M -Talls

9:15 P. M.—Dave Elman. 9:30 P. M.—Fletcher's Orchestra. 10:30 P. M.—Danziger and Danziger. 9:15 P. M.-Atwater Kent hour. 10:15 P. M.—Don Amaizo. 10:45 P. M.—Organ recital. 11:00 P. M .- Chinaland Orchestra. 370-WDAF-810. 326-WRNY-920 9:15 P. M.-Atwater Kent hour. 11:00 A. M.-Keeping fit. 416-WGN-720 11:15 A. M.-Health series. 7:00 P. M.-Musical program. 11:45 A. M.-Volga Trio.

416-WLIB-720 309-WABC-970 6:15 P. M.—Studio program, 12:00 Midnight—Musical program. 1:00 P. M.-Barclay Ensemble. 7:15 P. M.—Program summary. 7:16 P. M.—Boy Scout program. 428-WLW-700 7:30 P. M.-King's Orchestra. 3:00 P. M.—Organ recital. 8:00 P. M.-Schwarz Home Makers. 4:30 P. M.—Studio feature. 5:30 P. M.—Christmas afternoon pro-9:00 P. M.—The Mandoliers. 9:30 P. M.—Circle Ensemble.

gram. 7:10 P. M.—Theatrical reports. 10:01 P. M.-Waldorf - Astoria Orchestra. 11:00 P. M.-Club Manger hour. 7:15 P. M.-First Presbyterian Church services. 8:15 P. M.—Talk. 11:30 P. M.-Leonard's Orchestra. 268-WAAM-1120 9:15 P. M.-Crosley hour.

11:00 A. M.—Happy hour. -Luncheon music 7:20 P. M.-Major Bowes Family. 10:00 P. M.—Downtown Boys. 10:45 P. M.—Four Towers Orchestra.

11:15 P. M.-Great Notch Inn Orchestra.

268-WNJ-1120 10:01 A. M.—Pleasure hour. 1:30 P. M.—Musical program. 1:30 P. M.—Musical program. 1:45 P. M.—Wild life friends and foes. 2:00 P. M.—Musical program. 2:30 P. M.—Service program.

8:01 P. M.-Robert Treat orchestra 8:30 P. M.—Robert Treat orchestr. 8:30 P. M.—Bent Artists. 9:00 P. M.—Sanders's Carolians. 9:30 P. M.—Bert Andrews, tenor. 9:45 P. M.—Muriel Ryan, soprano. 1:00 P. M.—Dance music. 2:00 P. M.—Orchestra and vocal solo-3:00 P. M.-Marimba Band with string 256-WBBR-1170 2:05 P. M.-Watchtower Quartet.

2:25 P. M.—"Care and Training Children," Ruth Mendwell. 6:00 P. M.-Waldorf-Astoria Orches-2:45 P. M.—Violin quartet. tra. 7:00 P. M.—"The Christmas Muse," 2:55 P. M.-Dinner menu. 2:55 P. M.—Dinner menu. 3:00 P. M.—"What Is Necessary to Christian?" Frank Arthur Guiterman.
7:15 P. M.—National string quartet.
7:30 P. M.—"Creative Wonder," D

Trueman. John Niven.
7.45 P. M.—Physical Culture Prince.
8:00 P. M.—Half Hour with Great Composers, Arcadie Birkenholz, violiniet. 3:15 P. M.-Ronald Barclay, pianist. 3:30 P. M.-Radio dialogue. 7:00 P. M.-Studio orchestra. 7:25 P. M.-Fred Franz, tenor. violinist. 8:30 P. M.—A. & P. Gypsies. 9:30 P. M.—General Motors Family 7:35 P. M.-Talk to children. 7:55 P. M.-Fred Franz, tenor. 8:05 P. M.—Studio orchestra.

8:30 P. M.—Lecture, "Osteopathy is Treatment of Asthma and Pneu-Party. 10:30 P. M.—Francis St. Austell, "Radio Broadcasting from Listeners' monia," Dr. Mae Work. 246-WAAT-1220 11:00 P. M. Casa Lopez Orchestra. 10:30 A. M.-Brooklyn, Women's pro-

gram. 11:00 A. M.—Hoboken Women's program. 6:00 P. M.—Dinner music. 6:45 P. M.-Sport talk. 8:00 P. M.-Standard Laundry Orches 2:00 P. M.-Orchestra and vocal solotra. 9:00 P. M.—Bremer's hour. 3:00 P. M.-Marimba Band with string 10:00 P. M.-Manhattan Sammy, songs. 10:15 P. M.—Perfection radio program,

11:00 P. M.-Nut Club. 246-WEVD-1220 1:00 P. M.—Scholl's hour. 2:00 P. M.—George Rael, bass. 2:15 P. M.—Dr. Anna Siegrist, 'American Poetry.''
2:30 P. M.—Mrs. Annie Gray, ''I
Spirit of Christmas Yet

Come." 3:00 P. M.—Carrie Oberton, pianist.
3:15 P. M.—Helen Ardelle, soprano.
3:30 P. M.—Bishop Paul Jones.
3:45 P. M.—Tristan Wolf, tenor.
3:55 P. M.—Esther Van Slyke, "Mak-Nelda,

ing War Illegal."
4:05 P. M.—Mariel Nelda,
Christmas Songs."
4:15 P. M.—Christmas talk. 12:00 Noon-Jardin Royal Orchestra. 3:00 P. M.—Sessions chimes; Roseland 4:00 P. M.-Villa Venice Orchestra. 4:30 P. M.—Tristan Wolf, tenor. 4:45 P. M.—Langston Hughes, poet. 7:55 P. M.—Children's hour.
7:55 P. M.—Commodore ensemble.
7:55 P. M.—Sessions chimes; H. V.
Kaltenborn, "Current Events." 5:00 P. M.-Soloist 5:20 P. M.—Leon Schwartz, violinist. 5:40 P. M.—Robert McClelland, tenor.

246-WGBB-1220 7:00 P. M.-"Shop in Freeport" hour. 10:00 P. M.-Captivator's Orchestra. 11:05 P. M.—Roseland Orchestra. 9:02 P. M.-Quentin Redd, songs. 236-WMSG-1270

9:12 P. M. Thrift talk. 9:15 P. M.-Frances Allison, sourano. 9:30 P. M.-"Aviation," Harold Danne 9:40 P. M.-Frances Allison, soprano. 9:50 P. M.-Merchants' program prano. 10:20 P. M.—National program.

10:00 P. M.-Prof. Meyer, astrologer. 8:30 P. M.—Loew's Orchestra. 9:00 P. M.—St. Nicholas Arena bouts 10:50 P. M.—Maloof-Victor Orchester. 11:50 P. M.—Keden and Merman. 11:50 P. M.—Oriental program.

10:10 P. M.-Edith von der Lieth, so-10:30 P. M.—Maloof-Victor Orchestra. 10:40 P. M.—Oriental exposition.

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will be the soloist when station WOR broadcasts the next of the New York Philharmonic mext of the New York Philharmonic composed by Carl Maria von broadcasting differs from one countries. Society concerts on Thursday eve- Weber. The opera was composed ning. Miss Hansen will play by Weber to an English text writ-Tschaikowsky's concerto in D ten by James Robinson Planche major, consisting of three move- and was heard for the first time at ments: (1) allegro moderato, (2) Covent Garden, London, more than canzonetta: andante, (3) finale, al- a century ago.

Eighth Philharmonic legro vivacissimo. This concerto was composed in 1878, the thirty-TECELIA HANSEN, violinist, rection of Willem Mengelberg, is will be the soloist when sta. the eighth of the series to be broad-



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Generally speaking, the greatest difficulty encountered by the radio promoter in the Orient is the lack of cooperation between broadcast- an English broadcasting company length and at the same time. The of talent or operation. esultant effect is obvious and does not add to the standing of radio.

American listeners of 1922.

By CLIFF MAXWELL.

of the Philippine Islands.

high standard—certainly far above mah. radio is a sad commentary on both pensation and even poorer relief to British and Burmese radio interests, the radio fan who has spent his particularly the latter, in view of time, money and patience erecting

Philippines Lack Talent. Starting off with the Philippines, the principal difficulty the radio broadcast fan will encounter is lack keen about radio broadcasting-or of talent for the broadcasting anything else for that matter but studies, most of which of course studios, most of which, of course, are located in Manila. The radio merchant prince class, are about broadcasting and receiving sets are the only natives who are at all ingenerally American products and terested in it. The Parsees, when up to American standards.

native population interest themselves in radio, and because the larger cities and towns are so German made equipment. Howing even in the Philippines is not what it should be, considering the any radio set other than those Britlast few years. However, the studio upon in Japan. England is, in the of the Radio Corporation of the Philippines which has covered British made articles both in Eng-Philippines, which has several studios in and around Manila, es- land and her protectorates, just as pecially the one in the Manila Ho- patriotic as is Japan. Incidentally, broadcasting field, and will, no concerned, she is as antagonistic doubt gradually arouse more inter- toward the importation of foreign est and enthusiasm in this field made articles as Japan is. than is now being shown, because at bottom the Filipino is a progres- Godley Gets Permits for sive individual and is blessed with Rebroadcasting 'DX'

In Japan the principal difficulty

As in India and Burmah, the im- set-owners once a week. portation of radio broadcasting or For, in accordance with the Fed-9df

even the Chinese or the Germans. teners. His place well up at the head of the world Powers prove his adapta- WGBS to Radio Songs bility and acquisitive imitativeness.

This imitativeness, however, is betFrom 'Jabberwocky' ter exemplified by his warships and Song selections from "Jabberall else that has to do with engines wocky," the Williams College muor arts of war than anything else. sical play, based on "Alice in Won-Such being the case, and fully real- derland" and "Through the Lookizing the important part radio has ing Glass," will be broadcast by played and will play in war, it is WCBS Friday evening before the only to be expected that it will be performance at the Plaza. but a question of a brief time until Charles L. Safford, director of

in the slough.

The Orient — Where WRNY Plans Short Wave Broadcast

Reinaugurating an old custom station WRNY will hold a DX program on Monday morning. from 1 to 2 o'clock. The entertainment for this feature will be furnished by Ben Bernie's Roosevelt Orchestra.

try to another even as the tongues differ, but in no instance do pro-To enable short-wave listeners grams reach the status enjoyed by to hear this program, WRNY will use its short-wave station 2XAL, 30.9 meters, simultaneously

ing and code authorities. Messages puts on weekly programs, as is the from the one and programs from case in the Calcutta studios. the other go out through the same Neither place puts on a program still night air on the same wave worthy the name, either in the way

This, coupled with the various In India, however, English radio customs restrictions of the differ- regulations and laws are observed ent Eastern countries, plus a de- to the letter-and all radio operacided antagonism toward Western tors who have ever had occasion adio improvements, keep radio to work with any English radio broadcasting at a very unsatisfac- station, whether ship or shore, ory standstill-with the exception know that the English radio operator is most observant of all the The Radio Corporation of the international radio regulations. The Philippines have brought radio same thing may be said of all rabroadcasting up to a comparatively dio stations in both India and Bur-

that of any other Asiatic country. Another broadcasting station in Japan, with all its unsatisfactory Bombay, does occasionally put on radio conditions, laws and customs, a fair program. The station itself will easily come second, India third and the talent it uses is as good, if and Burma last-and Burma's in- not better, than any other Oriental difference and lethargic attitude station. One station, however, like toward all things connected with the Bombay station is poor comthe fact that Burmah is under Brit- an aerial and putting in a receiving set only to learn he is just out ing studio.

The Hindoo himself is not very they do have a set at fall, have ex-Due to the fact that so few of the pensive sets, and appear to be anxwidely separated, radio broadcast- ever, in this respect, importation of wonderful advance radio and radio upon by the British authorities in broadcasting has made within the India as the same thing is frowned tel, is doing good work in the so far as Indian and Burmah are

The range of the weekly DX seems to be the apparant confusion parties given every Sunday mornof radio broadcasting hours, which ing at 1 o'clock by Paul Godley, causes all sorts of interference in radio engineer who rebroadcasts (xe the loud speaker of the radio lis- distance station through WAAM, is 197 tener-in. An interference, however, being increased as each mail comes rewhich does not seem to arouse in bearing permits from the far- see much if any protest on the part of away stations whose programs are now being made available to local de

eral law passed since Go not only frowned upon, but such augurated his DX parties in the aid prohibitive duty placed upon these late winter of 1926-7, no station's oil things that it is very rarely one will program may be broadcast without find a foreign radio set in the coun- the written consent of some authorized official of that station. But all these things considered, Thus, before the DX parties could Japan is in a very fair way to remedy these evils and to do so within a reasonably short time. The Jap is the best imitator of any permission to bring its programs country, East or West, not barring within hearing range of local lis-

all his radio apparatus, laws, regu- music at Williams College and forlations and operations will be on a mer choirmaster of St. George's par with those of any country on Church in New York, wrote the music for the production. All the In India the radio broadcasting well known "Wonderland" scenes situation is in a truly lamentable will be featured with many songs condition. Nor is there the slight- and dances. Two of the song hits est excuse for it. The cities are are "You Are Old, Father Wilmodern and well governed, and with liam" and "The Walrus and the all the facilities they offer in the Carpenter." Charles Boynton, capway of power, location and opera- tain of this year's football team, tion it seems more than passing has been practicing for weeks to strange that broadcasting remains be able to sing the "Father William" verses, while standing on At the Raffles Hotel in Singapore his head.

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agency standpoint for over five their use, a thirty-two-page booklet years, Paul S. Weil has accepted. on "How to Get the Best Results an offer from the Charles Fresh- has been growing steadily since There will always be a demand From Your Radio Tubes" has just man Company, Inc., to assume the announcements were made in for the battery type of receiver, From Your Radio Tubes" has just man Company, Inc., to assume been published by the Gold Seal charge of their advertising and Electrical Company, Inc., manu-

language and tells how the newer associated with Frank Kiernan & to be of such a high standard that tery type of receiver must fill their type tubes were developed to meet Co. and for the last year and one their adoption by the public was needs. Owners of receivers where present day conditions in broad- half with Albert Frank & Co., New York advertising agencies.

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erated type. The demand on their part. Electrical Company, Inc., manusales promotion activities begin-tubes had been made for specially 11,000,000 homes that do not have designed receivers and all experi- the advantage of electricity supfunction of radio tubes in simple For over four years Mr. Weil was ments had shown their operation plied to them. For them the batonly a question of manufacturing there is no electricity are someradio receivers.

epochal achievement in the radio charging. Some cases have been a radio receiver that requires no biles would charge one battery attention after the plug at the end while operating their machines in of a wire cable is attached to the the daytime, such as farmers, and electric light socket and aerial and ground wires are attached. Alternating current in the home, such the latter had become discharged as is utilized for lighting and power for electrical apparatus, is cell equipment it is also necessary now used as the source of supply to travel or send for replacements, for heating the filaments of the and often this is necessary when 226 type tubes and also the power some special broadcast program is tube, 171 type, in the last audio desired to be heard. socket, and heat for the detector tube, UY-227, which, incidentally, are used in the new Crosley A. C. New Year's Eve Services Bandbox receiver. In using the From Trinity Church alternating current - a separate The New Year's eve services of nished and by its use there is no Trinity Church will be broadcast further need of A, B or C batteries, direct from the church through The large outlet for the new A. WJZ at 11:15 o'clock, Saturday C. radio receivers is to be found evening, December 31. in cities, for there electricity is The services, which will extend

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Veteran DX Fan Steps Out and Proves It. erested radio fans the Aerovox By W. H. MORRIS.

Wireless Corporation has published the first of a regular series of bi-7EDNESDAY, Dec. 14.—Here is the day for you to read the first monthly releases containing acwe are again! How did installment and it will not be long you like the first install- now, we suppose, before we get the curate technical information covernent? Just listened to WJR and Have been asked about what kind This four-page booklet contains the Cotton Pickers performing of a set we use out here. Well, on "Annabel Lee." Then the there are several hooked up all the Variety Hour. A woman soloist time and ready to go. A Resonament, try to tune in WNAC while Another loop set is dialed to WOR

WJZ is operating. Just now WNAC and never changed. An original is at the Hotel Brunswick and the Paragon six is still doing duty for DX. A Victoreen is dialed to KFI and other interesting information. orchestra is playing "Blue River" and very seldom changed. We use and not a peep out of WJZ. On "The Everyman's Four" for DX KYW a barytone "with no medals and the kick that it has for four him" is out on re- tubes is a plenty. Several slight hearsal and the Matthews Sisters changes have been made from the sing "So Tired." WTIC with a some difference in our estimation pretty heterodyne and ship code at- and the last change that was made

> playing "Lonesome To-night." We to-night a small-powered station on tried for Mexco City but being only the West coast was monkeyed with. tunes rather broad, all we could get time ago but to-night they came in was the heterodyne. Maybe Lindy better than ever, only to be burred too tired to talk to-night? out by static and ship code. It's WEBH playing at the Edgewater a pretty little K station and we Beach Hotel. WLS with John hope that some day we can Brown at the ivories playing pop- tell you who it really is. We have alar medleys. Static is rather bad heard part of its call letters but to-night but we just got a peep out not enough to satisfy us. That of KNX and a little later on, station as others with a faint KOIN. KOH was there with a barn whistle coming through will be dance and what a time they were watched carefully every night. having. They induced us to stay We listened to WJAZ sending out with them. KFI and KFRC both Christmas greetings to Baffin Land and it was mighty interesting. We

THURSDAY, Dec. 15.—Read to- hope those away up North received day where "engineers" reported to all that was being told them. Chithe Radio Commission their find- cago and Southern stations are ings on heterodynes. Wonder what coming in fine to-night and one kind of a college course it takes could spend an entire evening lisfor one to be proficient in hetero- tening to just one of them. Away dynes? At WFAA a band is playing up North a fine program comes 'To a Wild Rose' and along comes from Calgary, Canada. Have not spark code dispatch that nearly heard them of late, but their proruined our speaker. "Sugar" and grams are always good even when "Dream Kisses," banjo selections, it is far below zero up there. KFI being fondled from WBBM. Miss helps to fill in the late gap on a Emma Kaufman, a soprano with Saturday night, as does WHO. with a beautiful voice, is hitting the dance music high notes from WSM. The Capitol SUNDAY, Dec. 18.—We all went

doing very nicely. And they have tions of very interesting sermons, organs down South too. WWNC is choirs, soloists and organ selecplaying "My Souvenir." WHAM tions. Counting them all up, we from the Camera City is producing attended fourteen services. WJBT, program well worth listening to. with a band of music helping to ust ran across a small local ad- convert souls, splendid oratory and vertising a "Coil Tenna." Must be organ selections was indeed interomething to attach to a loud esting. Southern stations came in peaker for French programs? very well-particularly WJAX.

WJKS on a heterodyne is ship- WLS with an Indian instructor to oing "Drowsy Waters" through the Boy Scouts gave a very interesting sleet and rain. WAWA of Fort talk. PWX seems to have one Wayne, Ind., playing "Indiana." chance of a lifetime, and that is on KFH with a dance orchestra that Sunday nights. Their program the corn belt should be delighted came in very clear, loud and dis-"Wait Till the Sun Shines, tinct. West coast stations were Nellie," a recent (?) hit on Broad- coming in poorly so we switched to way, is just being heard from WBAP and they entertained us KOIL. WDAX and frolicsome with the "Seven Aces" until bed-Night Hawks are sure busy. Hank time. and his gang from the Crazy Quilt MONDAY, Dec. 19 .- A fine cold Studio at WBBM are keeping night out but static is going to be awake all the ice bound sailors in bad for DX and our four-tube set the Great Lakes. KFI is coming is on a vagation-shy a 222 tube, fine through the static to-night, which seems to be scarcer than KHJ was faintly heard. KGO with hens' teeth. Started way down the high class program. Canadian scale for a starter. Tuned in on and Southern stations all tuned in something that startled us for a excellently. A very, very fine long DX shot. The more tubes we

barytone from WHO is singing lit the further away we knew the "When Day is Done," so I guess station must be. Listened intently to a sports writer's opinion and we will call it a day too. FRIDAY, Dec. 16.—It was demon- when he finished we were informed strated to-night that with a real that it was WBRS. Fine for a good set WCFL could be tuned in starter and time out. Next we liswith plenty of volume and clarity tened to a man talking about Rolwhile WEAF is operating. How lins College and what they did ever, our time was taken up to there, &c. We knew that Rollins night by a high priced set that has College was in Winter Park, Fla., a record at home to be a wave and naturally we had an idea that wrecker. Anywhere, anything it was the Winter Park station. anytime and that sort of stuff and After the speaker finished we were two operators at the dials working informed that Dr. Hamilton Holt, in reliefs. WAIU up to 10:54 P. M. president of the Rollins College, was the first call letters that were had just given the talk from heard beyond our locals. Later on WMSG. Twice fooled. WJAX came out of the speaker So we switched away up the the set is right to listen in.

uned in on my own set.

and a few Chicago stations. The dials and listened to the "Joy home of the set is but a few blocks Boat" and Indian songs from in grand style. Coming in like a eral nur

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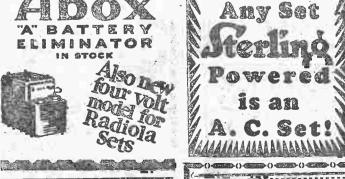
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data useful to the average radic fan. It shows a popular push-pull audio amplifier suitable for either A. C. or D. C. operation; technical with a sweet voice sang "Katy changed. A one-tube Carborundum discussion about dielectrics of con- Did." If you want a tough assign- hook-up is used only on WEAF. densers; the significance of "temperature coefficient"; a means of obtaining a variable plate voltage from a fixed B battery eliminator,

tached, stopped us to listen to news was to install a 222 tube. Quite eports from Mexico a la Lindy. "I some fussing in doing the shield-Walked Back From the Buggy lot until the special shielding ar-Ride"-a girl was singing from rives from out West. Dial readings are carefully noted WBBM with a dance orchestra. and particularly those signals that That's a nice station right near as yet have failed to come through WHN for you to try out. WSAI at and those dial readings are tuned the Hotel Fenton with the orcnestra in nightly. For nearly two hours

should install her with its gang.

Mabel Ackerman from KMOX is of the country and listened to por-

away from our antenna and I have KYW. Then to Dallas, Tex., where been invited there some night when a Southern band was booming out After the party left KFI was Chicago st in, we listened to sev-SATURDAY, Dec. 17 To-day on W

(Continued from Third Page.) switch terminal on the modulator which is nearest the top of the front panel.

Now we will wire up the C bias connections. Join the coil jacks No. 3 and No. 4 together and run this same wire over to the right hand terminal of bypass condenser No. 1; continue this same wire to the lug near it marked "F." This connection will supply the bias for the selftuned transformer. Connect another wire on the right-hand terminal of bypass condenser No. 1 and run it up to the lug which is connected to the rotary plates or frame of the antenna tuning condenser. Continue this wire to the No. 9 coil jack and then over to the lug which represents the rotary plates of the next tuning condenser. From here it continues on to the next lug of the last tuning condenser and ends up at the No.

Solder the lug under the antenna binding post to the coil jack lug No. 1. Then solder the lug under the ground binding post to coil jack lug No. 2. Run a wire from coil jack No. 5 up to the left-hand lug of the .001 Sangamo. From the other lug on the .001 condenser run a wire through the hole in the subpanel directly over the stationary plates of the balance condenser and solder it to the lug. Push a wire through the hole in the subpanel directly over the rotary plates of the balance condenser and solder to it. The other end of this wire should be soldered to the lower right terminal of tube socket No. 1. At this time solder the lug "P" to this same terminal. Next solder a short wire to the lower left terminal of tube socket No 2 and solder the other end to the lug "G." Connect a short wire from the lug on coil jack No. 6 and join the other end of it to the lower left terminal of tube socket No. 1.

Connect a wire to the lower right terminal of tube socket No. 2 and run it over to the No. 7 coil jack lug. Solder a wire to the No. 10 coil jack and continue it to the lower left terminal of socket No. 3. From the lower right terminal of socket No. 3 run a wire to the No. 11 coil jack lug. Connect a short wire from the lower right terminal of socket No. 4 to the lug of coil jack No. 14.

Push a wire through the hole in the subpanel just to the left of tube socket No. 1 and fasten the end of it to the stationary plates of the condenser directly above it. In a like manner connect a wire to the lower left terminal of tube socket No. 3, push it through the subpanel up to the stationary plates of the second tuning condenser. Join another wire to the lower right terminal of socket No. 4, run it through the hole in plates of the third tuning condenser.

Solder a wire to the left terminal of bypass condenser No. 2 and run it to the soldering lug labeled "B," and from here continue on to the lower left or "B" terminal of the left audio transformer, as to get to the control board over the shown in the picture wiring diagram. regular telephone line and used it suc-From some convenient point along this same wire run another wire to the lug on coil jack No. 8. continuing this same wire over to the lower contacts on the Carter variable resistance. The other terminal on the Carter resistance should now be connected to coil jack No. 12.

To the upper right terminal of tube socket No. 4 solder a wire and run it to the upper lug on the Sangamo .002 condenser, continuing this same wire on to the lower right hole in the subpanel directly over the "P" terminal of the right or first audio transformer, through this hole and to the binding post. Solder a wire to the lower terminal of bypass condenser No. 5 and run it down to and through the hole in the subpanel, finally connecting it to the "F" post of this transformer. Now connect a short wire from the lower right terminal of socket No. 5 and join it to the "G" post of the transformer to the right of it by means of the hole in the subpanel.

To the upper right terminal of tube socket No. 5 solder a wire and run it away over to the left to the "P" terminal of the left transformer, which is the

Completing the New Henry-Lyford No. 6 socket and run it up to the "G" post on the left audio transformer. Join the lower terminal of bypass condenser No. 3 to the "F" post on the left audio

> Connect up the volume control in the following manner. Run a wire from the lower terminal of bypass condneser No. 5 and run it through the right-hand hole in the subpanel (below the 4 ohm resister) and connect it to the No. 2 terminal of the centralab modulator. In a similar manner join the No. 1 terminal of the modulator to the lower right terminal of the No. 5 tube socket.

> Now take out the four machine screws holding the lugs P. B. G and F in place. Slip the B-2 transformer in its proper position at this time, as the wiring is complete except for the cable. Be sure that the B-2 is inserted so that the "P" and "G" terminals are nearest the tube

#### Cable Connections.

The proper location for each wire of the battery cable is shown on the picture wiring diagram by capital letters. Below is a list of the colors of the cable and connections to the A. B and C

Y.—Yellow, A plus, B minus.

M. W.—Maroon and white, 22½ or 45

B plus det. M.-Maroon, 90 B plus.

R.—Red, max. B plus (135 v. for 112 or 112-A; 180 v. for 171 or 171-A). G.—Green, C minus 1½ v.

G. M.—Green and maroon, C minus G. R.—Green and red, C minus (9 v. for 112 or 112-A; 40½ v. for 171 or

Having soldered on the battery cable we are ready to put on the knobs and

dials on the front panel With the shaft of the balance control turned as far to the left as possible put on the knob and tighten the setscrew so

Turn the shaft of the volume control to the left and place the knob on the shaft so that its arrow points to the left. This is the "off" position for all the filaments. On the Carter 10,000 ohm resistance adjust the shaft so that the contact is in the position shown as "X" on the picture wiring diagram. When in this position put on the knob and point the arrow directly at the detector coil. This is approximately the working posi-

tion of this control. The last thing to do is to mount the drum dial and couple up the condensers to it by means of the nine-inch rods. First of all place the two small bakelite vernier disks in their retainers, which are supported by the drum plate. The smallest amount of oil will help for smoother running. If they bind a little sand them down a little with a fine

Now push one of the nine-inch rods through the bearing hole of the antenna tuning condenser. Continue sliding until it goes through the special bearing in the drum plate and stop when the rod protrudes about five-eighths of an inch beyond the inside nut of the special bearing. Hold the shaft in this position slide on the proper dial on this shaft (look at the dial from the front to see that the numbers are not upside down) and then fasten it securely to the shaft by means of pliers on the knurled cap on the dial near the plate. It will be noticed now that the dial and shaft will rotate freely but the rotary plates on the antenna condenser still do not move. This is correct, and at this time (being that the condenser is lined up with the special bearing) we can tighten down securely the two machine screws holding this condenser to the subpanel.

Do not tighten down the setscrew which couples the shaft to the variable condenser plates until later. If it happens that the dial does not turn smoothly apply a very small amount of graphite only to the gears of the small vernier.

### By-Products

(Continued from Second Page.) covered it in an airplane flying above that mobile spectacle. He used a short wave transmitter to send out the description of what he saw, and a receiving room in the control room picked it up and passed it on. The air was bumpy that day and the poor engineer was violently seasick, but he kept his description going just the same.

The R. C. men who covered the opening of the Holland Tunnel had a busy time. They had to cover the ceremonies at both ends, while the central control the subpanel provided to the stationary, synchronized and filled in the gaps. Then there is the adventure of the engineer catching a Philharmonic concert, whose two radio lines and one phone line went completely out ten minutes before the program began. He managed cessfully for more than two hours, all the time expecting to have the operator interrupt and demand another nickel.

Cases of fortitude and endurance are those of an R. C. man who stuck to his post although a waiter had knocked over a pitcher of ice water which cascaded over him, and that of another who for a long program held his amplifier in his lap while with his hands he kept in connection two broken wires which he had not time to hook up otherwise. Advance tests and spare equipment help to insure against a break in a program, but the remote control engineers must be ready for the unforeseen and do their best to keep the program coming through with that regularity which the public has grown to expect from broadcasters as it does from

So if it rains one minute before an open air band concert and your program comes through just the same you will know that the R. C. man has done a Minnesota shift with his equipment to wherever the band has gone to get under cover. If the church service to which you are listening is heard smoothly and Join the right-hand Carter tip jack in good tone you will know that the R.C. west. If you can find out which way coming signal. After this is done once

his one each for the organ and echo organ. If the report of a football game you are hearing falters but carries on you will know that the R. C. man has stoutly defended some part of his equipment against a rooter whose team has just made a touchdown

Such is the task of that important link in the radio chain, the remote control engineer. And he doesn't care if the broadcast he must make is tricky and hard. For that gives him a chance to show what he can do.

#### Tube Filaments.

After the wide publicity given to the great value of thoriated tungsten filaments it seems amazing to the radio fan to look over the various tubes these days. Some of them have filaments made of ordinary nichrome wire used in heating devices. These have the Wehnoxides, somewhat like the old WD tubes which used coated platinum wire. Some engineers say that iron wire would be as good as nichrome in this type of filament. With the A. C. tubes at least one manufacturer uses a heavy carbon filament for the indirect heating of the cathode, and advertises this feature to show the ruggedness of his design. A carbon cored wire has long been suggested for use with oxide coatings .--

#### Our Common Enemy.

Static is the curse of every radio fan. After paying a few hundred dollars for the latest equipment he finds that the old crackle sounds just as badly as on a ten-cent store set. It is a real shock to him to know that money can't buy immunity, and it's all the worse now that the Bureau of Standards seems to have given up hope. Only a short while ago Dr. L. W. Austin stated that static would probably never be eliminated. But it has been found to be somewhat directional. You receive most of your trouble from the north or south, east or

that the arrow points directly to the left. Remember, a very small amount will do

The other half is now mounted in the same way. Push the shaft through the end condenser and keep it going until it is flush with the inside of the drum plate. Now hold the dial in position and push the rod through the bearing hole of the drum disk. Holding the drum disk in position, keep pushing the rod through until it just goes into the other drum the least bit. This is correct when the end of the rod has gone through the end condenser and rests one and one-quarter inches away from the nearest bearing of the end condenser.

The purpose of pushing the rod through and into the second drum slightly is to help in lining up the two drum disks. With pliers tighten the drum to the shaft. Now rotate this side of the drum until smooth action is secured. It may be possible that when one side of the drum is rotated the other side turns also. This may be due to having the rod go too deeply into the other drum. A little oil here helps a good deal and perhaps the rod needs sanding to make the end slightly smaller than the drum bearing hole. Have patience in this little detail and your efforts will be rewarded by having a drum dial that is really smooth in action.

ify in the strictest sense of the

word, and that his appointment

would be acceptable to the large

public interests to be served by the

The name Hiram Percy Maxim,

insists radio gossip in Washington,

is synonymous with radio progress

in this country. As president of the

American Radio Relay League Mr.

Maxim has for many years, in a

manner, been "chairman" of the

nucleus or backbone of radio in the

United States-the promoter and

director of the interests of the ap-

proximately 17,000 radio amateurs.

mental radio from the time-a

He has been at the helm of experi-

decade or more ago-when it was

considered no mean achievement

street, to the present moment, when

amateurs in this country exchange

messages with amateurs in Aus-

tralia, more than half way around

Familiar With Problems.

Mr. Maxim, contend those spon-

the Federal Radio Commission, is

familiar with the problems of

broadcasting-for what is amateur

radio but broadcasting in the inter-

national Morse telegraph code!-Mr.

Maxim has attended the National

Radio Conferences held in Wash-

ington and he has the confidence

of Secretary of Commerce Herbert

Hoover, at whose behest the na-

tional gatherings of radio men were

convened. This esteem is mutual.

for Mr. Maxim told this writer that

Mr. Hoover has largely been re-

sponsible for the preservation of

However, contends Washington

radio rumor, the appointment of

Mr. Maxim would not involve the

attachment of strings to his de-

cisions. The Department of Com-

merce nor the so-called powerful

commercial interests of radio, it is

argued, would be without political

levers in demanding special privi-

leges. For in serving 17,000 radio

experimenters in the past he has

represented a cross section of in-

terests, political and otherwise, of

Friends in Washington and else-

where who are advancing his name

in this connection are generous in

their praise of his qualities as a

bination needed on the Federal Ra-

dio Commission to solidify its mem-

bership into a working unit, active

in the solution of the pressing radio

The backers of Mr. Maxim have

evidently lost sight of the fact that

all places on the Radio Commis-

sion have been filled with the ex-

ception of the vacancy caused by

Admiral Bullard's death. This

member must come from the dis-

trict embracing Pennsylvania and

adjoining States. There is a pos-

sibility, as some have pointed out,

that those in favor of Mr. Maxim

may be under the impression that

O. H. Caldwell, present appointee

from the northeastern district, will

resign if the Senate refuses to con-

firm him, thus leaving the way

open to another candidate. Whether

or not the members of the com-

mission or the President is sup-

posed to select the chairman has

been a much argued question, but

it is assumed that if the members

themselves agreed on their chief

the President would abide by their decision, since it has been his be-

lief that radio listeners want re-

When asked for a few words con-

lief and not politics.

leader and radio technician, a com

the entire United States.

the rights of amateur radio.

soring his name as a nominee for

the earth.

for two amateurs to talk across the

Federal Radio Commission.

The Hammarlund flexible coupling is now placed on the end of the rod so that the setscrews will no more than engage the rod. Now slide through a regular condenser shaft (supplied with each condenser) until it also engages the collar of the coupling and sufficient for the setscrews to hold. Now tighten the setscrews in the collar and also those machine screws which hold down these two condensers to the subpanel, as both are now in alignment. The next step is to attach the front plate on the dial. Due to the fact that either drum may be moved slightly from side to side (the setscrews on the condensers are not screwed down yet) and the plate may be twisted either way a happy medium will be found when both drums will turn 180 degrees without touching the front plate. When the correct position is found set the single condenser at maximum capacity (plates fully interleaved) and then place the number 100 on the dial opposite the pointer. Now tighten the setscrew on the condenser. The rotary plates will now turn with the drum. In the same manner place the other two condensers in maximum capacity position and with the drum adjusted to 100 tighten down the setscrews on both variable condensers. Both condensers should now rotate with the right-hand drum. By setting both drums to read approximately the same numbers and by placing the thumb midway between both drums the action will be that of a single

#### Testing.

The receiver is now ready for its tryout. Connect up the battery cable properly, place the three coils in their respective sockets and connect a good cone such as a Timmons or Western Electric to the Carter tip jacks. Five -O1A tubes are placed in the first five positions and a power tube, preferably, a -71-A, should go in the sixth socket or in the socket directly to the right of the left audio transformer when looking at the receiver from the front.

After connecting both aerial and ground set the balance control so that the arrow points about straight up and turn on the set by giving the volume control a twist. After tuning in a station if it is found that the set oscillates adjust the Carter resistance until the set works and sounds the best.

Keep in mind that the most desirable position for the Carter control is just before the critical unstaple position.

It may be possible that the two tuned circuits controlled by the two gang condensers are not in resonance. This is rectified by either loosening the coupling or loosening the setscrew on the righthand condenser. For most accurate adjustment a weak signal should be tuned in and then with the hand on the rotary, plates adjust the end condenser for maximum signal strength, keeping the other two dials in resonance with the inMaxim Urged as Head

#### of Commission ITH three members of the Federal Radio Commission unconfirmed by Congress and the vacancy created by the death of Rear Admiral W. H. G. Bullard vet to be filled, official Washington is addressing its attention to nominees for the unoccupied chair nanship and any possible vacancies caused by the refusal of the Senate to confirm present appointees. Discussions of the subject in the national capital are in agreement that the new chairman should be preeminently a radio man. In the last month a score or more of names have been proposed, with only one, that of Hiram Percy Maxim, standing out as possessing all the necessary qualifications. Both radio experts and politicians believe that Mr. Maxim would qual-

Nothing varies so as our reasons for happiness. One person's joy is often another's sorrow—

ERHAPS that longed-for roadster is finally to become a reality \* \* \*

R the "big deal" did go thru and the New Year will find you comfortably fixed \* \* \*

AYBE you have made an advantageous "change," offering brighter prospects than you had ever dreamed of \* \* \*

THEN again it may be the new electric radio playing so beautifully alongside your Christmas tree \* \* \*

st st st ACH and every one, besides a thousand other reasons, will be responsible for some one's Merry Christmas.

May your

Holidars

Be Joyful

and 1928

Bountiful.

This advertisement is published both

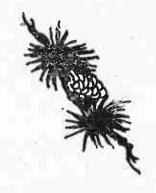
to wish our many friends and cus-

somers a Merry Christmas, as well as

to inform them of our growth and

progress, which permits us to better

Signed W. H. N.



### Mould it interest you why this is Walthal's Merriest Christmas?

ECAUSE we have to the best of our ability served over half a million radio folk during the past year\*\*\* ye ye

TECAUSE we have placed in their keeping nearly 3,000,000 dollars in quality radio merchandise\*\*\*

ECAUSE we have more radio customers than any radio, department or musical store in the world\*\*\*

ECAUSE the year 1927 witnessed the birth of our 5th and 6th new stores, in Yonkers and the Bronx, besides our massive 25,000 square foot warehouse on Spring street. يان على على

RECAUSE we are about to open our seventh great store\*\*\*

ECAUSE the strict adherence to our policy of "Radio Insurance" has won the confidence of the radio public. A 36 36

ECAUSE we look toward the coming year of 1928 as the greatest in our history.

The Home of Radio Insurance







Radio Retailer of Greater New York

### The Radio Amateur's Part In the MacMillan Expedition owner of British amateur radio station 2KF. Partridge took a sheaf of WGY may consider themselves

The "Ham" Is as Old as Wireless, Using Limited York, N. J. From Sarkisian's station Club, as this organization, the first Power for Transmitting Many Distant Records Have Been Made: Telegraph Code Used

Everybody who reads newspapers has been introduced to Collins, of Cedar Rapids, Iowa, are him this summer by the line, in virtually every news dis- Donald C. S. Comstock, of East Hartpatch about the MacMillan Arctic expedition, which said, "this message was transmitted through amateur station-operated by ---."

Some nights he was in Cedar Rapids, Iowa; then again he would be at South Manchester, Conn.; he ranged from Portland, Ore., to Portland, Me., and he showed up in Australia and in England.

The great majority of the messages given out by the National of York, Pa. Comstock and Pinney, Geographic Society, and many of those made public by the Navy De- as friends and neighbors of John partment, depended upon these amateurs.

Reinartz Chosen for Operator

Collins Makes Speed Record

Two-Way Distance Record

From coast to coast, and from the & news dispatches, and also personal tances, they were the men with whom the same sitting. messages, and doing it as a gift of the expedition must make its arservice. For the amateur's only rangements. Short waves and low pedition was out of touch with all program of Scandinavian music, recompense is a lively and enduring affection for his hobby, "ham radio," power were the logical methods of other kinds of communication, daily other kinds of communication a and a desire to contribute further to communicating from the Far North. news dispatches, messages to and piano recital, violin recital and prothe radio science he has done so

most successful in "getting" WNP, veloped a host of new radio theories. and receivers of the transmitting series of six lessons in home hygiene (meaning the wireless station aboard the expedition's flagship, the Bow- within reasonable financial bounds where clarity of reception was pos- McGee, R. N., chairman of the public doin) is a 15-year-old schoolboy who precluded the use of high power. took his vacation money to go to Wiscasset, Maine, and interview John Reinartz about short wave sending of the National Geographic Society and receiving. Another is a well-to- and of the American Radio Relay do tobacco planter. A third is a suc- League worked out plans with John cessful business man who burns the L. Reinartz, operator of the Bowdoin midnight tubes as his hobby.

Amateur as Old as Radio

Amateur radio Is as old as radio was decided that member stations of dation during the coming winter, in to cope with sickness when no nurse Amateur radio is as old as radio the American Radio Relay League in the American Radio Relay League in the United States and Canada—or transmitter there were a host of entransmitter there were a host of enthusiasts striving mightily, with other countries, if necessary—would local councils of the league will dishygiene will be answered by her. comparatively inferior equipment, to converse with their fellows in nearby converse with their fellows in nearby towns. There gradually grew up a sent back to this country by the extense representatives will take place by until April 21. comaraderie of accomplishment. pedition. At the same time messages in the fall, following the enrollment These transmitting amateurs were between members of the expedition of the listeners. It is expected that able to converse with each other and their families and friends in the at least 100,000 of the listeners will from town to town by means of the United States would be handled by be enrolled during September, which special telegraphic code evolved for the amateur radio stations.

As the discoveries of scientists, at terruption throughout the stay of the A communication from Arthur R work in laboratories, and of ama- expedition in the far north. Daily Tucker, acting president of the founteurs, at work in their radio shacks, schedules have been maintained. dation, tells of the plans for the orstretched out the distance over which News dispatches have been handled ganization of the councils which alit was possible to converse, there was with a speed that would delight the ready have taken shape. born the idea of finding a station most critical editor, and personal between two others that were unable messages have kept the morale of broadcasting and reception which can to communicate directly with each the exploring party and of the fami- be solved best by the listeners," says other and make of the half-way sta- lies at home at a higher pitch than Mr. Tucker. "All radio interests was ever possible under old condition a relay point.

The development of this idea was tions. the development of the American From the standpoint of getting desired, but until this work was be-Radio Relay League. Enthusiastic news home the radio accomplishments gun by the foundation the task was amateurs banded together to furnish are ideal. On a recent occasion, when regarded as too large for any existrelay service to their fellow ama- the airplanes of the expedition ing organization to tackle. teurs and to the public. As the started out on an exploration trip at "A careful record is being kept of years passed on and the apparatus 10:47 in the morning, word was sent the first persons to join the Listeners used in transmitting and receiving out from the Bowdoin at 11:03 that League in each state, and in each city, units became more efficient this need the planes had just started on a and special honors will be paid them for relaying became less acute. With three-hour run. this change came another.

Development of Relay Idea

to the equipment of vessels that had the dispatch was relayed to the head- be supplied on request. Election of never before considered carrying quarters of the National Geographic permanent officers will be held radio; portable, low-powered amateur | Society in Washington at 11:56 and | throughout the country simultaneousstations became a necessity for ex- immediately released to the various ly, on ballots provided by the founpeditions to odd corners of the world news service that cover the country. dation. where other means of communication | So great was the speed with which

tion and the homeland, because of the streets of this country with the civic organizations and of radio dealvarying conditions, were not always news before the airplanes had re- ers is being enlisted. The foundation able to talk with one specified station | turned to their station with the at home. Thus once more the relay- schooner Bowdoin. ing of messages became a matter of A number of remarkable feats in prime importance to the transmitting | radio were accomplished in the course amateur.

Transmitting over great distances were handled in record time, exand with low power that makes verbal tremely long distance reception was communication difficult, the radio recorded and many stations mainamateur uses telegraphic code, sim- tained daily schedules over a considflar to that used by wire lines. In erable number of days at a time. stead of the familiar clicks of the land line there is a steady flow of short and long buzzes—dots and owner and operator of Station 6AMM, the program at WEAF on Tuesday, dashes—and as the evening wears on succeeded in carrying on two-way at 4 p. m. She won the Texas Fedand morning approaches the radio communication with the expedition eration of Music Clubs contest for amateur has before him long mes- when it was off the coast of Green- young professionals in 1923, and is sages that no other method of com- land, making a distance record for at present the director of the choir

for the present MacMillan expedition dispatches copied by I. H. O'Meara, able clarity and exceptional range officials of the National Geographic of Gisbourne, New Zealand. O'Meara coupled with an intelligent under-Society wanted a reliable method of was unable to make two-way work standing of music. carrying on daily communication be- of it, however, due to the extreme tween the expedition and the United distance. States. A survey of the possibilities Other members of the American Lichtman, and of the Master Instishowed that dependence might be Radio Relay League, who are re-tute of United Arts, will also be at placed on this amateur-who, much corded as contributing to this re- WEAF on Tuesday. The remainder like the explorer, was willing to work markable distance work are L. Eldon of the afternoon program at WEAF long hours and endure discomfort for Smith, of Whittier, Calif.; R. Bar- will be given by the Women's League

Amateurs in America successfully man, of Mobile, Ala., and John Ban- A talk illustrated by vocal selections talk with Argentina, with Indo-China, sola, of St. Petersburg, Fla. with Japan, with New Zealand, with One set of messages covered a prano, will be given by Mrs. Leo M

the journey within a day. The ex- Lady Radio Listeners of WGY pedition stations established contact To Be Woman's Club Members with J. A. Partridge, of London, All women within hearing distance of messages and immediately relayed non-resident, non-dues-paying memthem to D. H. Sarkisian, of West New bers of the Schenectady Woman's to the headquarters of the National of its kind to broadcast a compre-Geographic Society in Washington hensive program, will offer weekly was but a trifle after that.

Others on Honor Roll

Others sharing honors with A. A. ford, Conn.; @. H. Pinney, of South Manchester, Conn.; A. W. Everest, of Pittsfield, Mass.; E. H. Koeper, of direction of the radio committee of Elmhurst Manor, N. Y .: E. B. Duvall, the club, of which Mrs. W. D. Bearce of Mount Ranier, Md.: J. M. Meyer, of Milwaukee, Wis., and Fred Link, Reinartz, operator on the Bowdoin, whose home is also in South Man-Gulf to Canada, radio amateurs have If such men were available and chester, hold enviable records for been working long hours into the were able to carry on nightly conver- getting messages through from the home economics, philanthropy, parnight, taking thousands of words in sations over such prodigious dis- Northland and returning answers at liamentary law, national character-Throughout the time when the ex-The entertainments will include a

Governmental regulation had given from the members of the party, and grams by the club chorus. the amateur the short-wave bands routine naval messages have had free A feature of the Schenectady One of the amateurs who has been where his skill and experiments de- way on the short-wave transmitters The necessity of keeping a hobby radio amateurs in every country and the care of the sick by Miss Anna

### With those facts in mind, officers Listeners' League To Be Organized

A nation-wide gathering of radio for the first time by radio. The inand one of the outstanding exponents listeners is planned by the Listeners' formation given by Miss McGee of the new short-wave theories. It League of the American Radio Foun- should enable the woman in the home will be marked by intense activity by This plan has worked without in- local members of the league.

"There are many problems in radio agree that the organization of the listeners is something greatly to be

later, at the first national gathering

Received by A. A. Collins, Radio "Directions for forming the local Amateur radio stations were added Station 9CXX, at Cedar Rapids, Iowa, councils and the state councils will

"The assistance of governors mayors, broadcasting stations, chamthe entire transaction was accom-These stations away from civiliza- plished that many papers were on bers of commerce, local radio clubs, radio shows to be held this fall. Inquiries are welcomed, as well as sugpestions from radio listeners.

of the summer. Long-distance relays be determined by the members them "Detailed policies of the league will selves at the first big gathering."

Voice Heard Around World Mrs. La Rue Nelson, soprano whose voice when broadcast by WFAA in Dallas, Texas, was heard in Bruce Stone, of San Jose, Calif., Glasgow, Scotland, is scheduled on munication could bring in so rapidly. two-way work. The record of great- in the Central Congregational Church est distance covered by a message in Dallas. Her voice has been de-When plans were being developed from the explorers goes to several scribed by critics as one of remark-

Theresa Ferrentino, a young pianist who was a former pupil of Morris tholomew, of Porto Rico; J. W. New- of the United Synagogue of America. rendered by Mrs. Leopold Rich, sounique path, but succeeded in making Abrahams on the "Music of Israel."

WITHIN REACH AT REDUCED PRICES Radiola Super-Heterodyne

ly for the non-resident radio mem-

bership, and the whole is under the

The program is especially note-

jects discussed. There will be talks

on club work, individual political re-

sponsibility, conservation, home hy-

giene, psychology in child discipline,

istics of the drama of to-day, etc.

drama, reading, two-piano recital,

Woman's Club programs will be a

health committee of the club and a member of the Schenectady County

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These lessons are built up from "Red

Cross Classes in the Home Care of

the Sick" and they are given with the

consent of the American Red Cross

special talks and musical entertainments during the fall and winter

At This Attractive Price This Every department in the Schenectady Woman's Club is offering at Best Value Offered Today least one afternoon program especial-AUTHORIZED AGENT

DE FOREST WODEL D 17 \$149
ATWATER KENT MODEL 29 \$115 worthy for the variety of the sub-FADA 5-Tube New Model \$122.50

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Our easy terms make a Radio Set available for every home.

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like this will never again be presented as long as you live. This is not just advertising talk, but a statement of Fact Which Cannot Be Contested, Disputed or Doubted. Please Note-We advertised 1,400 of these sets in various newspapers last week. Hundreds bought from all over the country. They're going fast -very fast. First come-first served.



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Including set, for \$16.95 we will give AB-SOLUTELY FREE a \$7.00 Federal He a d Set and an 80c Phone Plug. In. Factory Sealed Cartons.

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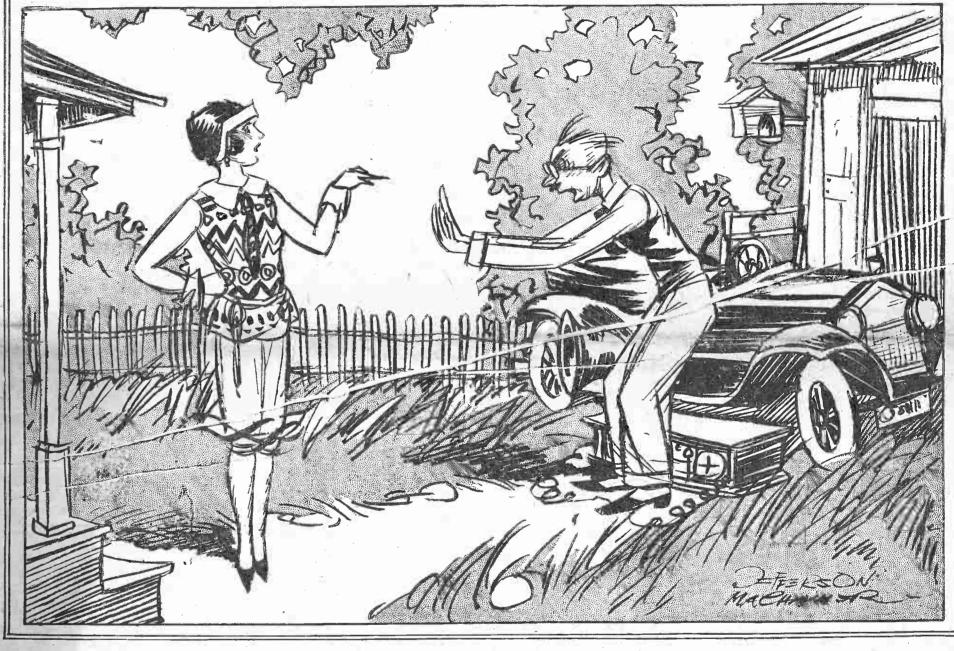
# THE NEW YORK HERALD NewYorkstate aribune RADIO MAGAZINE

SUNDAY, SEPTEMBER 6, 1925

# And I Learned About Radio From Him

The Amateur's Wife Tries to Operate the Family Flivver, but Is Persuaded by Hubby to Take Up Radio as Less Dangerous

By LILLIAN DICKSON



"Flivver and radio may not be closely related, but they were hubby's favorite pets and he would as soon think of letting you lay violent hands on one as on the other."

HE trouble with men is that they | look alike. This is because they have | and stopping, and backing, and turning, | tom. I started blithely for the hill—then know everything. Of course, there are lots of other things the matter with them, too, but that's the main difficulty. A feminist, or maybe she was just a sort of Mrs. Josh Billings, recently remarked that "men hez got the most brains, but women hez the most sense." Women, though, are seldom satisfied to let well enough alone. They want to have the most brains, too, and they create considerable unpleasantness by their efforts to shine.

My advice to all young wives, and to old ones as well, if they haven't already found it out for themselves, is to be as smart as you like, but never to try to learn anything from your husband. I know whereof I speak. I have just had some lessons in tuning the family radio.

I hadn't intended to learn to tune the radio. It all happened indirectly as a result of my desire to run the family Ford. Now, a flivver and a radio set may not be closely related, but these two were by virtue of the fact that they were hubby's favorite pets. He would as soon think of letting you lay violent hands on one as on

Hubby knew his own particular Ford like a book. He could distinguish its bark | evening for a week we sought the quiet of from the snorts of other equally decrepit | back roads in the gloaming and hubby in-

flivver. Every Ford owner recognizes something about his own little Lizzie that distinguishes her from all the others. It's like a facial expression or a wart on the nose. I can't explain it, but it's there.

#### Hubby Knew His Flivver

Anyway, as I was saying, hubby understood Lizzie. He could tell that she needed water when she hiccoughed and that she wanted gas when she spluttered. Now and then I have heard him absently mutter, "Whoa, Liz," as he put on the brake.

Lizzie may have been near and dear, but she spent many evenings alone and neglected in the barn when hubby acquired his new radio set. He counted the world well lost as long as he could sit turning the dials of his new toy and listening enraptured to the music that was wafted to him. This gave me my inspiration. Perhaps now it would not seem guite such a sacrilege to suggest that I run the car.

Hubby was hardly enthusiastic, however, but by appealing to his manhood and his sense of humor and the general gameness of the whole male sex, I managed to get him to consent, and every the reverse, and swearing at the valves | hill? I began to frame some suitable and all the things every thoroughgoing motorist ought to know. By the end of the week I had attained a large vocabulary of profanity and the painful knowledge that hubby's respect for my intelligence was not all that I might wish.

The following Sunday morning we drove up to the neighborhood garage to replenish the supply of oil and gas. It was there hubby got the big idea.

"The trouble with your driving," he said, "is that you can't do anything unless somebody is sitting right beside you and saying 'do this, do that.' Now the thing for you to do is to go ahead and drive. You know enough theory. Do you suppose you could drive home now without any instructions?"

I gulped, and through my head flashed the amazing rigamarole of putting on the spark and turning on the gas etc., etc., and I said proudly that, of course, I

#### The Author Drives the Ford

Our start was great. For a block or two along the main highway we ran neatly. I even turned the corner into our own little side road without disaster. Then came Waterloo. The road leads down a divvers. Some wags say that all Fords | itiated me into the mysteries of starting | steep hill with a sharp turn at the bot-

"What," said I to hubby, giving Lizzie a little more gas as a display of confidence, "should I do when we get to the

hill? Should I turn off the gas, or give it more spark, or step on the brake, or all three?"

In my anxiety, I turned my attention from the wheel for a moment and Lizzie lurched dizzily toward a tree. She was just about to make a girlish effort to climb it when I saw our danger and straightened her out again, but in the struggle the answer was lost and the next moment we were skimming rapidly down the hill. Perhaps "skimming" isn't exactly the right word. It ought to be swooping or dashing. Anyway I realized just how an aviator feels when his plane takes a sudden nose dive. Lizzie gave a splendid imitation of one. I could hear hubby yelling "brakes," but it was too late. Already we were approaching that sharp corner and all my energies were bent on making Lizzie turn properly and go on toward home instead of landing ignominiously in the neighbor's front yard.

Lizzie turned with a gallant snort, or

Continued on page five

### Notes on the Prevention of Oscillation in R. F. Sets

A Variable High Resistance May Be Shunted by a Large Condenser and Connect In the B Battery Lead to Control a Set

By Harry J. Mark

ESISTANCES are an inseparable factor in all electrical circuits. best unwritten stories of the year-It may not be there in the form of a rheostat, potentiometer or was made known yesterday by Ber-He has lived for many years in the other piece of resistance apparatus, but every part of the circuit, whether it is just copper wire connections, condensers, coils or any other unit, has some resistance value. It may be great or small, as the case may be, but it exists, and is a factor in the circuit. Copper wire is a good conductor, meaning its resistance is low, while a non-conductor simply means something that has a very high resistance. Present-day radio apparatus is so >-

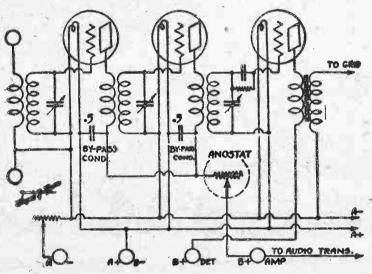
#### Oscillation

This elimination of surplus resist- condenser between the B terminal of ance permits much sharper tuning the primary on the radio frequency and, therefore, improves selectivity. transformers and the filament termi-But in radio frequency circuits it nal of the tubes, this artificial resistmultiplies the tendency of tubes to ance can be shunted out of the tuned out. "Don't haul down the sails." he go into oscillation, producing the as- circuit. This condenser closes the suggested, "for the storm is passing sortment of squeals, howls and whis- plate circuit to the filament of the tles which not only come out of the tube for the radio frequency curhoud speaker, but back up and go out rents. In other words, on account of skeptical. A hundred yards away, on an the air to play havoc with the the condenser these currents do not the King's cutter, the crew was pre-

to add a potentiometer in the sec- the tuning and selectivity. ondary circuit of the radio frequency This variable resistance provides The air is clearing."

designed as to reduce as far as prac- primary coils of the radio frequency tical all resistance in the tuned cir- transformers and the B battery to prevent oscillation by reducing the den storm. plate voltage on the radio frequency tubes. Now, by connecting a 1/2 MFD have to pass through the resistance-The old and incorrect practice was hence the resistance does not affect

stages. This was equivalent to re- a means of reducing the plate voltage placing the resistance back into the and therefore controls oscillation. apparatus. It reduced the oscillation This means of controlling oscillation



tendency, but it likewise killed the was first utilized commercially by E. selectivity that was desired and in F. Andrews in the Deresnadyne re addition materially reduced the vol- ceiver.

But this control must not be such as sistance part for controlling volume.

ume. Resistance should not be added where it becomes an integral part of use of this by-passed plate circuit the radio frequency circuits. The fundamental cause of oscilla- well as an oscillation control. This tion is due to a great extent to the is done by using an extremely high amount of voltage across the plate variable resistance having a maxicircuit. If this voltage is controlled mum value of several megohms. The so that it can be adjusted to a value circuit is just the same as for the just below the point where oscillation control of oscillation. The first part starts then radio frequency amplifica- of the resistance can be used for tion can be used to full advantage. oscillation control, and the high re-

to add resistance in the tuned cir- Volume can thus be adjusted without Plate Voltage Control

Oscillation can be effectively pre- A combination control which may vented if a variable resistance is con- be used for this purpose is known as nected in series between the plate or the "anostat."

Model Homes Include Radio | 5th Sesquicentennial Radio

the slightest distortion, and with

great saving in B battery current.

Engineers have now developed the

Architects are now including a place As a result of arrangements just in the home for radio receiving ap- concluded between Colonel C. B. Colparatus. Outlets for loud speakers are lier, director general of the Sesquiplaced in various parts of the house. centennial International Exposition, No home is truly modern unless it to be held in Philadelphia from June contains a radio receiver. Many home to September next year, and H. S. owners have made alterations so as to Bolster, director of the American have radio apparatus in a convenient Radio Exposition Company, which place some are in music rooms.

Builders and realtors utilizing years the outstanding series of na-"model" homes as a sales stimulus to tional radio expositions given an-"model" homes as a sales stimulus to nttract buyers, realize the importance of radio and have included a set in the furnishings of the house. A model home was recently opened for inspection in Syracuse, N. Y., with a receiver in a pretty Gothic arched nook, called "the radio room." This room formed a part of a spacious center formed a part of a spacious center to bring about the united participahall on the second floor.

ble to install radio receivers in such which is expected to attract more a way that they are just as beautiful than 60,000,000 visitors. Leading to look at as the finest pieces of fur- radio manufacturers have already reniture. Wiring also makes it possible served space at the exposition. to put jacks in various rooms so that a receiver in one part of the house may be used to operate one or more Dr. Watson Little to Talk musicones, or loud speakers.

Newly built hotels are including Dog lovers who have followed Dr. apparatus as an important part of George Watson Little's series of their service to guests, with a mas- animal talks from WOR with inter receiver and several speakers for terest, may expect to hear the veteruse in rooms when the guests desire inarian speaking on the "Great to be entertained or hear the news. Dane" from WOR next Monday -Crosley Radio Weekly. evening.

has sponsored during the last four

all on the second floor.

Concealed writing makes it possition, the sesquicentennial exposition,

On the Great Dane

#### How Radio Aided Sir Thomas Lipton and rated a leader among the unique Win a Boat Race and original popular artists produced in recent years, is the opening attrac-

How Sir Thomas Lipton with his gram, when he will present several famous Shamrock defeated King original songs, none of which follow George of England and the equally famous Britannia in England's Whiteman, is one of the most imporgreatest regatta of 1925, largely tant figures in the development of through the use of radio-one of the gineer and inventor, who has just re- quality of native Negro music, espeturned from abroad in order to display new devices at the Radio World's Fair.

The race took place off Bournemouth and the Shamrock won easily, Whiteman heard Robison's Deep because the other contestants hauled River Orchestra in Kansas City playdown their sails in the fear of a sud-

Listening on a super-heterodyne originality and fascinating quality of receiver, on board the Shamrock, to rhythm that he persuaded Mr. Robibroadcast reports of the regatta, Mr. son to join the Whiteman organiza-Johnson told Sir Thomas that the attion in New York. mospheric disturbances seemed dying over and won't reach the harbor." Sir Thomas and his captain were

paring for the anticipated "blow." "I'll stake my reputation on it," Johnson persisted. "Wait a while.

Sir Thomas, it is stated, laughed, and to the amazement of his veteran captain insisted that full sail be maintained, with the result that the Shamrock was soon two miles ahead of the others. And, as Johnson maintained, the sun soon appeared, and then it was too late for the other vessels to put on full sail again.

"It was a tight situation for me to e in," said Mr. Johnson, in telling the story in his apartment, 300 Central Park West. "But I was certain that the sudden elimination of static meant that the storm was over. And yet storm signals were coming over by radio for ships farthest out."

The regatta took place on August 17, and Mr. Johnson was amazed that the report of the circumstance had not reached the United States.

#### Composer-Pianist at WOR Willard Robison, composer-pianist NOW'S and original popular artists produced the time! tion of the WOR Monday evening pro-

the set formulas of harmony.

Mr. Robison, in the opinion of Paul

new and original jazz ideas, and he

is known to thousands of radio lis-

cially the spirituals. As a pianist

Robison is thought by many to be

phenomenal. He is left-handed and

has developed a supernormal power

ing some of Robison's own composi

Start now to learn a profitable profession. The Radio Institute of America (conducted by RCA) offers courses which qualify for the U.S. Government Commercial or Amateur Radio License. Expert in struction. Day and evening classes. Also courses for radio dealers, jobbers and salesmen. Fall sessions start soon. For further information call or

tions and was so impressed by their Radio Institute of America Box 55, 326 Broadway New York City



# RADIO SHOW NUMBER

# Herald Tribune

# RADIO MAGAZINE

The Herald Tribune, realizing from the start the importance of radio and the interest which it holds in the minds of the public, publishes the only Sunday Radio Magazine in New York. In keeping with the policy of giving its readers all the news in the radio field, the Herald Tribune will issue a special "Radio

This "Radio Show Number" will contain special articles written by experts, news stories of the exhibits will also find the announcements of the leading radio manufacturers and dealers in this special number of the

# NEXT SUNDAY

The Herald Tribune has prominent booths at both Radio Shows. You are invited to make them your headquarters during your visit.



OF THE

Show Number" next Sunday, September 13th.

at both radio shows, illustrations of various apparatus on exhibition, as well as the regular features for which the Herald Tribune Radio Magazine is noted. You

# RADIO MAGAZINE

# Information on the Construction of a Simple Loud Speaker Controlling Device

This Unit May Be Used in Connection With Any Radio Receiver Employing an Amplifier

By A. DINSDALE

progressed beyond the stage where they crave for noise. The modern listener is no longer content to have his loud-speaker signals so loud that they can be heard a mile away. All he requires in the way of volume is just sufficient to fill the room in which he and his family are

He has become critical about the quality of his reception, and, having tired of DX hunting, desires only to obtain the most faithful possible reproduction of the program being broadcasted by his local station. This is all to the good, not only from the standpoint of those who have to suffer, or enjoy the output of the loud speaker, but also for the benefit of the art of broadcasting.

Much has been written on the subject of the elimination of distortion in broadcast receivers and much useful information given as to how the quality of loud speaker reception can be improved. The advent of the paper cone loud speaker has also tended in the same direction, but still there are a few receivers and loud speakers which will not bear further improvement.

This is due to a large extent to the fact that very few persons possess more than one loud speaker, and to ask it to reproduce equally well anything from a soprano solo to a complicated orchestral rendering is asking the impossible at the present stage of development.

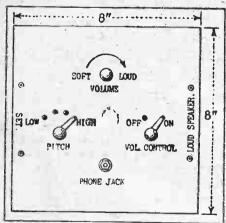
This is more or less well recognized and many corrective devices have been recommended for the remedying of various faults in reproduction. The difficulty in this respect is that no single combination of correctives will successfully handle all classes of music

#### Effects of Correctives

For example, if capacity is shunted across the loud speaker terminals for the purpose of toning down a soprano's high C to prevent blasting, diaphragm rattle or tinniness of tone this combination will, if left undisturbed, cause severe muffling effects when the local basso profundo comes on the air.

To improve the tone of his performance it may be necessary to cut out all capacity and introduce instead a choke, more or less high in value.

Having gone through one or two such experiences, altering the set each time,



A suggested panel lay-out for the control unit

the B. C. L. will usually decide to split the difference and connect up both choke and capacity across his loud speaker windings. The values of these he will adjust until the reproduction is uniformly fair over the entire range of musical productions to which he usually listens.

Having done that he will probably be enveigled into buying a new type of loud speaker, with different characteristics, and have all his work to do over again. Another difficulty met with by users

of multi-tube sets is that of controlling the volume to just the right degree. Between one A. F. stage and another there is usually too great a charge, so the only thing to do is first to get the signal too loud and then try to cut it down by dulling the filament of the last stage, or of the detector tube, or detuning the set

HE majority of B. C. L.'s have his outfit. Tubes do not operate at their highest efficiency if the filaments are dulled beyond a certain point, and detuning generally causes trouble from in-

> Having reached this stage it is apparent that what the critical B. C. L. requires is a separate variable control unit, such as is about to be described.

#### Circuit Arrangement

The circuit diagram of the arrangement is shown in Fig. 1, from which it will be seen that the unit consists of an iron core choke, a selection of capacities of different values and a variable resistance, all connected across the loud-speaker terminals, with the exception of the Fig. 1 condenser, which is connected in series.

This series condenser confers upon the unit a further advantage, that of isolating the fine wire windings of the loud speaker from the plate current of the tubes. This plate current, in the case of multi-tube sets, perhaps employing a small power

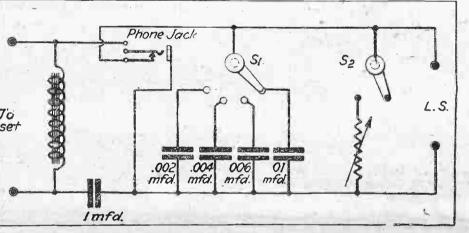
By moving switch S1 over the four contact studs any of the condensers shown can be connected across the loud speaker and the pitch of the reproduction altered to suit the listener's taste.

By means of the switch S2 the variable resistance may be put in circuit for the purpose of cutting down volume. This resistance may very conveniently be a variable plate resistance, as sold for resistance capacity coupled amplifiers, with a maximum value around 100,000 ohms,

The condensers may be of any highgrade type, but the flat type, fitting into end clips, are more convenient if obtainable, for then it is an easy matter to change them if the values shown in Fig. 1 do not quite suit the reader's outfit.

#### Panel Lay-Out

Some enthusiasts may prefer to mount all the control apparatus on the panel and baseboard of the latest set they happen to be designing when they read this, but as the presence of knobs and



The wiring diagram of the controlling unit herein described

tube in the last stage, is very considerable | switch points on the tuning panel is genand may put a severe strain, not only on | erally looked upon with disfavor directions the windings, but also on the diaphragm, which, before any signal arrives at all, will be subject to a considerable pull.

Under such conditions a peak load, caused by a sudden violent burst of static or a very strong signal, may quite conceivably burn out the speaker windings. With the arrangement, shown in Fig. 1. the steady plate current is carried by the choke, but the high value of the condenser insures the free passage of all

audio-frequency currents. A further advantage of avoiding the passage through the speaker windings of the plate current is that frying or breathing noises, caused by small frregularities of current flow, are obviated and a quieter

ing up of distant stations when these are | Most experimenters will be sure to find

will be given for making up the apparatus in a separate unit.

A further advantage of doing so is that such a unit may then be used in conjunction with any receiver, and if the receiver is not situated in the same room as the loud speaker the control unit may be located near the speaker and within easy range of the listener.

In Fig. 2 is shown a suggested panel lay-out which will be found both convenient and pleasing in appearance. Suggestions for the panel engraving are also given. Fig. 3 shows the corresponding baseboard lay-out.

The choke employed should have a high impedance or a loss in signal strength will be experienced. There are various suit-The phone jack is provided so that able chokes on the market. The sechead phones can be conveniently inserted ondary of an old Ford coil will be found at a moment's notice, the operation of in- to do very well, or almost any similar serting the phone plug simultaneously cut- high impedance iron core coil, such as the ting out the loud speaker. Such an ar- primary of a bell-ringing transformer or rangement facilitates tuning and the pick- the secondary of an A F transformer. something suitable in the junk heap.

### A High Powered British Broadcaster

Continued from preceding page

metal case. The anode input to the drive | of stranded cable and a shielded air conoscillator is about eight kilowatts, which | denser. The grids of the magnifier are supplied to the magnifier, but this permits of securing the necessary magnifier grid excitation with a very loose coupling, resulting in negligible reaction back on the drive and consequent freedom from frequency variation with variation of mag-

water-cooled rectifier tubes and three for all the water-cooled valves usednamely, one kilowatt each at 20 volts All these methods are inefficient and 50 amperes. The oscillatory circuit of prevent the user getting the best out of the magnifier consists of an inductance

excited inductively from the drive circuit. the direct grid current required being about 300 milliamperes for the three valves. The grid circuit includes an antireaction coil which is inductively coupled to the plate inductance in such a manner that the internal valve capacity coupling The magnifier unit is formed of four | is neutralized, so that it is not possible for the valves to operate as a self-oscillator if water-cooled oscillatory tubes of the same | the drive excitation is removed. This adtype as the drive. The oscillator tubes | justment is an important factor in securare capable of dealing with an input of | ing stability of working and constancy of | it may be difficult to understand what thirty kilowatts at 10,000 volts, and in | wave length, The closed oscillatory cirthis station are normally operated at | cuit of the magnifier is inductively coupled 10,000 volts, with a plate current of 2.5 | to the aerial tuning inductance, which is amperes. The filament input is the same of the same stranded cable as the closed circuit coil,

The modulator unit consists of four

Continued on page nine

Some readers of more fastidious tastes may wonder why the choke is not made variable as well as the capacity. The chief reason for this is that to obtain or arrange a choke having suitable tappings is not always a simple matter, and to have the capacity variable is usually sufficient

If there should happen to be any discrepancy in the value of the choke chosen so that it is just not quite suitable for some particular musical rendering, correction can be applied by means of capacity. However, in the position shown. the choke acts more in the role of a filter for the plate current. Its value is not at all critical so long as it has sufficient impedance to avoid a weakening of signals. Its presence does have an effect on the quality of reproduction, but the main controlling factor is the condenser

However, there is no objection to making the choke variable, if this can conveniently be arranged, and many experimenters may like to do this. In this event it will be necessary to make provision on the panel for another rotary switch, with contact studs connected to different values of choke.

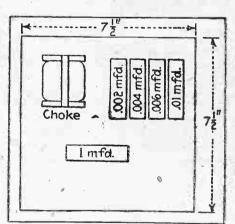
#### Operating the Unit

To operate the unit connect the A. F. output (phone binding posts or jack) of the receiver to the terminals marked "set" in Fig. 2, and connect the loud speaker to the two terminals on the opposite side of the panel. If desired jacks can be substituted for the terminals in each case.

There is no reason why the control instrument should not be made portable, flexible electric light cord being used for the connections to it, so that wherever the receiver and speaker may be located the controller may be placed beside the listener, so that he can at all times adjust it to suit different items on the program.

With regard to the values of the condensers, the values shown in the figures are merely suggestions. Individual experimenters may find it necessary to change these values somewhat, according to the characteristics of the loud speaker in use. For this reason it is better to have condensers of a type which are readily interchangeable, so that the best values can be determined quickly and

It will not take the experimenter long



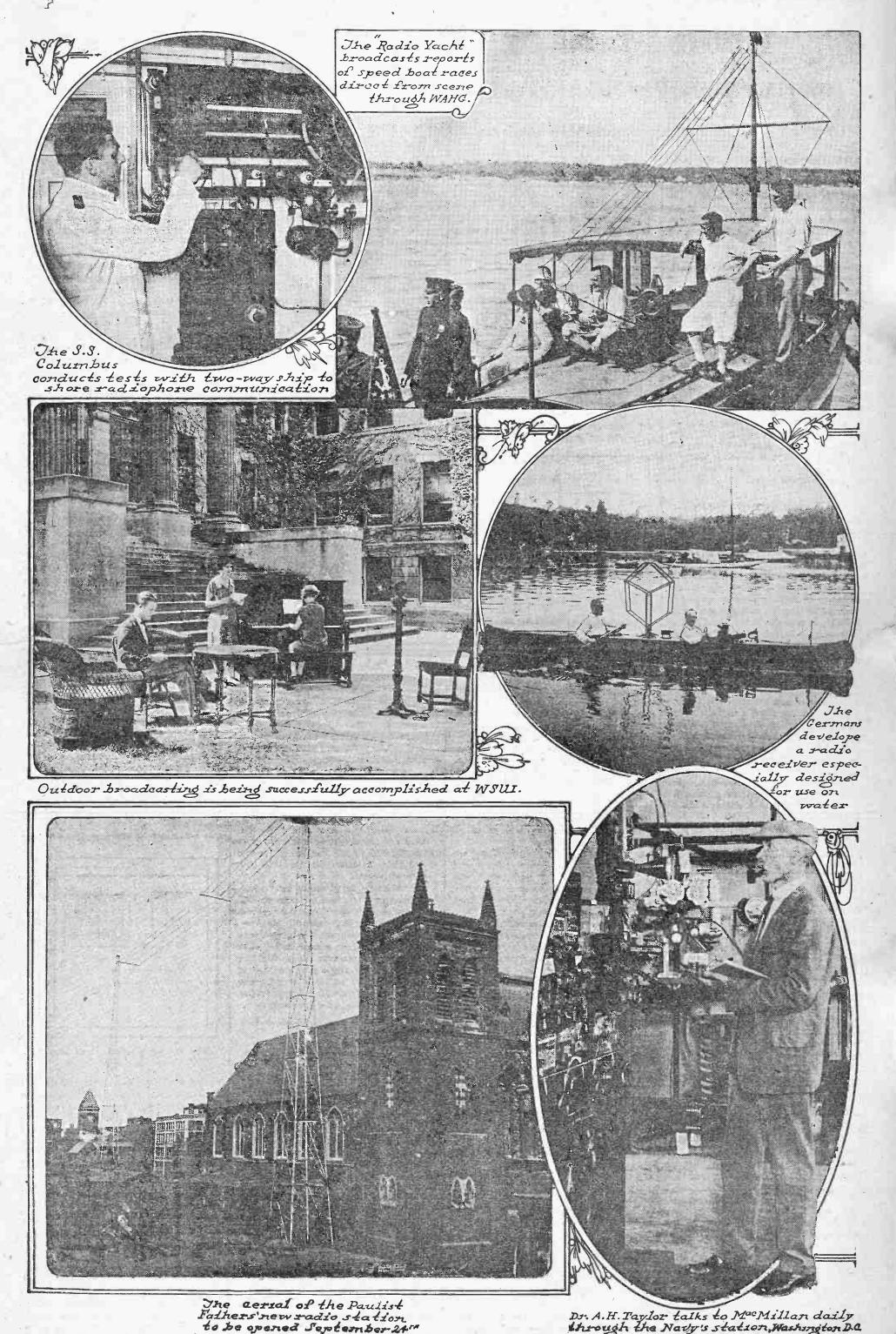
the parts of the unit may be

to find out that almost every single item of a broadcast program will require a different value of capacity for best reproduction. Speech, for example, will be most clearly received with one value, a solo with another, and instrumental music with another.

The volume control will also be found to be most useful. It frequently happens that when a receiver is set to give just the right volume for loud orchestral music, when the announcer comes on the air his voice is not nearly so loud, and, unless the receiver adjustment is altered, he says.

With a unit such as has been described ready to hand, all these delicate readjustments so dear to the fastidious listener can be made at a moment's notice, without leaving the comfort of one's chair. thus adding considerably to the enjoyment of the program,

# Up-to-the-Minute News of Radio in Pictures



### A New High Power British Broadcasting Station

water-cooled rectifying tubes and six water-cooled modulators. The modulating valves are similar in size and appearance to the oscillators, but have a much more open grid mesh, with a low amplification factor. The modulator is worked with plate voltage and current equal to that of the magnifier, the current being adjusted by the setting of the grid negative voltage. For normal working this setting is between 1,200 and 1,300 volts negative, thus a large grid sweep is possible during modulation without running into grid current. The grid negative voltage is obtained from a dry cell battery, and as no current is taken from the

battery this source is quite satisfactory.

The smoothing circuits for a set of this size present a formidable problem, as the permissible ripple is very small for high quality broadcast telephony, and the smoothing units are necessarily somewhat bulky and costly. The condensers for the smoothing system consist of zinc plates with glass dielectric, oil immersed in porcelain containers. The total capacity used on each half of the circuit is approximately 3.5 microfarads and the inductance about sixteeen henrys. The smoothing inductances are closed iron | ing water is stored in a concrete lined core chokes placed in oil tanks. Each choke contains about five hundredweight of iron, and there are eight of these in all.

The submodulator unit consists of one air-cooled tube, operated from the same

Continued from page three

high tension source as the main modu- | minute through each valve jacket, and lator and coupled by resistance and capacity to the grids of the modulator tubes. The grid of the submodulator is in turn coupled also by resistance and capacity to the sub-submodulator, which is a block of four special tubes supplied by a 400volt accumulator battery and with accumulator heated filaments. The usual land line amplifiers are situated in a separate is an unusually high ratio of the power room removed as far as possible from the high frequency apparatus, and are adaptable for amplifying either the audio frequency currents coming over the land lines or those from the microphone in the

The arrangements made for water cooling the tubes' anodes is worthy of attention. As the anodes are at high potential it is necessary to insulate the tube water jackets from the main supply of water. This is accomplished by running the water both in and out of the jackets through spraying nozzles. The water spray forms an almost perfect insulator and therefore no loss is sustained by leakage. The coolpend holding about 5,000 gallons and is pumped from there up to a tank in the roof, falling by gravity through the tube jackets back to the pond. The rate of flow is adjusted to allow one gallon per

under these conditions the water leaving the valves is only increased in temperature a few degrees. As it is important to use cooling water free from lime or other ingredients capable of forming a deposit on the anodes, rain water is utilized and arrangements are made to drain water from the roof into the storage pond, a rainfall of one inch giving about 1,000 gallons to the pond.

The control of the whole apparatus, including operation of the running machinerv, is effected at a control table in a corner of the transmitting room. Should the engineer on duty notice anything wrong, he can switch off everything by pushing one button.

Daventry was opened officially on July 27, and in this connection it will perhaps be of interest to give the broadcast program given at the official opening cere-

A short announcement regarding the con-struction and equipment of the station was

Program from the studio in London was then received through loud speakers and was as follows: Norman Allin, bass. Sarabande et Tambourin...... Daisy Kennedy, violin solo.

Moment Musical.....Schubert-Kreisler

power broadcasting stations.

7:30 p. m.—The recital of a poem specially written for the occasion by Alfred Noves.

The Right Hon. Lord Gainford, P. C., chairman of the British Broadcasting Company, introduced the Right Hon. Sir William Mitchell-Thomson, Bart., K. B. E., M. P., the Postmaster General of Great Britain.

His Majesty's Postmaster General formally declared the station open.

A short announcement regarding the con-

given. His Worship the Mayor of Daventry, Councilor J. H. Johnson, spoke shortly on Daventry and its antiquity.

In conclusion, the author would like to voice a few points on the future of high

> Undoubtedly, Daventry will be followed by similar stations in the various countries, which will help to establish intercommunication between the nations. High power broadcasting is having very

careful study here and it is understood that in the very near future a station of considerable power will be opened in the neighborhood of New York City.

One of the great benefits of superpower broadcasting is the overriding of static due to the increased signal strength; fading is also another factor which will be reduced.

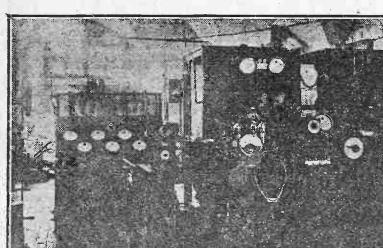
There is one last point, however, which will require careful government legislation, that is, the prevention of too many stations being erected in any one zone. for, unless there is some control of this nature, there will result chaotic jamming and "beating" of signals.

### Germans Shaping Facilities For Exchange of Programs

**Germany Will Have Twenty Broadcasting Stations** by the End of 1925, Says Dr. Hans Bredow; Radio Fans Pay Two Marks a Month

66 T T ELLO America!" Thus the long arm of radio hurled the voice of our English cousins across the briny deep and ushered in the first feeble attempt at international broadcasting. It was a startled American public that tuned into a subsequent program originating in London and distinctly caught the peal of the famous Big Ben Chimes. This, indeed, was a remarkable achievement, but those of us who are fortunate enough to live in this age of scientific wonders are becoming accustomed to such history-making

The reaction of the public to this &experiment was so favorable that en- ment in Germany could be more augineers decided that a program of development should be initiated for the purpose of determining the technical retary of the Reichspost, which confeasibility of establishing a regular trols broadcasting in Germany, and trans-oceanic broadcasting service. A has been the most expert in general series of statistical observations on radio development in that country. He trans-Atlantic radio signals followed is founder of the Heinrich Hertz Geand radio facilities on both shores sellschaft, a society composed of the are now in the course of construc- leading radio experts, which is sup- power of one of our broadcasting get their rights. are being decided upon with a view to radio listeners.'



Broadcasting station in Berlin which sends out musical programs

casting service between the two con- radio development in Germany was as tinents on a systematic basis.

operating in an international broad-

Co-operating Program

Recent announcements that the

casting program and that the latter lishing American programs in Ger. special permission from the Reichs velopment for the Jewel Electrical members of the American Radio Revenue and the stress upon the importance of publishing American Programs in Ger. special permission from the Reichs velopment for the Jewel Electrical members of the American Radio Revenue and the stress upon the importance of publishing American Programs in Ger. special permission from the Reichs velopment for the Jewel Electrical members of the American Radio Revenue and the stress upon the importance of publishing American Programs in Ger. special permission from the Reichs velopment for the Jewel Electrical members of the American Radio Revenue and the stress upon the stress upon the importance of publishing American Programs in Ger. special permission from the Reichs velopment for the Jewel Electrical members of the American Radio Revenue and the stress upon the stress u part of this year may witness the exmany and German programs in American programs in German programs in American programs in German program programs in German programs in German program programs in German program programs in German program program program program pro change of program material, are supica. David Sarnoff and I especially transmitter or receiver. Therefore, needs for greater distance in radio compete for the record of most "miles plemented, so far as German activ- studied this question when he was in whoever buys a receiver must declare transmission using much less power per watt." A twenty-one jewel watch ities are concerned, by a statement Germany. We agreed that as soon as it to the Reichspost and pay a month- than is now the vogue. just issued by Dr. Hans Bredow, State the high-power broadcasting trans- ly fee of two marks, which is col-Secretary of the Reichpost, on radio mitter was completed Germany would lected by the postman. development in Germany. This state- attempt to receive its programs at a "The Reichspost has erected a cer- the fear that continued use of high that the greatest distance must be ment was prepared at the request of station especialy equipped for the tain number of radio transmitters powered stations would remove much attained at least three times during David Sarnoff, vice-president and gen- purpose and to rebroadcast them from and nine companies located in Ber- of the attraction from radio trans- the year in which the contest runs. eral manager of the Radio Corpora- the central station of Kænigswuster- lin, Munich, Hamburg, Leipzig, Mun- mission. He pleaded for the use of tion of America. In commenting on hausen, near Berlin.

Dr. Hans Bredow

tion. Wave lengths, power, and re-ported by voluntary contributions, and transmitters, so that it in turn can | "Next to England, the development plus of the single companies goes ceiving facilities, based on the out- also organized the national schools of be well heard in America. There- of broadcasting in Europe has been for the improvement of the broadcome of these engineering tests, and education, which are not only instruc- after, at certain intervals, an "Amer- most rapid in Germany. In the casting stations and for the developour knowledge of etheric conditions, tive, but enjoy great popularity with ican Program," specialy arranged for coming month of October the Ger- ment of radio technic." America, will be transmitted by this inaugurating an international broad- Dr. Hans Bredow's statement on station, to be received and rebroadcast in the United States. The Radio Corporation also will prepare a "German Program," which will be received by the Reichspost and transmitted to the German broadcasting companies. "In Germany we have seen, with

the greatest admiration, the development of the American radio industry and how rapidly broadcasting spread out over your country. Just as with the telephone and the automobile, we see that all technical progress in America is utilized straightway on a large scale for radio. This is brought about by the technical sense of the American people and, furthermore, by their power to buy. In Germany only few are able to spend some hundred marks for a good radio set. The maority of the listeners must satisfy themselves with a simple crystal set Therefore, the amount of business transacted on the radio market is so small that it is impossible for the German radio industry to keep up Radio Transmission Needs broadcasting stations at their own "I am deeply convinced that radio expense, and their programs free and that it will contribute to the organize the broadcasting service so American Radio Relay League at the plate input. German Post Office, and the Radio mutual understanding among all that it would pay for itself. This was Edgewater Beach Hotel in Chicago,

ster, Frantfurt-am-Main, Stuttgart, highly efficient transmitters that many will, provided that the neces contracts with the Reichspost to per watt" basis. "No statement on radio develop- sary funds are available, increase the transmit good programs. The com- The amateur radio enthusiasts set finely.

"It appears, therefore, that the when discovered. a certain amount of advantage. The towards it. listeners. Furthermore, the compan- whole country. ies are not compelled to rely for "Special stress is laid upon educaprogram, therefore the companies special schools for national educa are anxious to meet the wishes of tion.

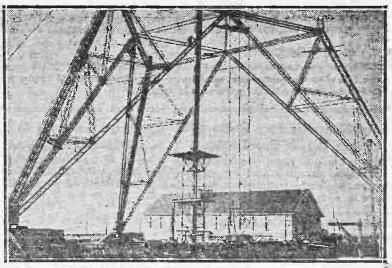
panies receive 60 per cent of the fees | man broadcasting service will be two collected. With this money they must years old, and will have one million keep up their own transmitters and listeners. Besides these there is pay for the programs. The Reichs- certainly a big number of wireless post receives 40 per cent of the fees. pirates who are heavily punished

American people obtain their radio "The government and the people programs free of cost and that the consider broadcasting as an impor-Germans have to pay for theirs. tant item of civilization, and the However, this disadvantage has also press is generally friendly inclined

whole system is based upon the "The most prominent artists cosound business principle of the equiv- operate in the broadcasting servalent of the production. The receipts ices. The performances of the of the companies depend upon the opera houses in Berlin, Munich and number of listeners; therefore the Frankfurt-am-Main are transmitted, companies are interested in broad- and it is even possible, by a system of casting a good and varied program, lines of communication, to broadand in offering only what pleases the cast every performance over the

their income upon advertising, which, tion which is made possible by the as a rule, the German listeners de- co-operation of the best teachers. For cline. The liability of the listeners this purpose, the nine German broadto pay gives the right to a good casting companies have established

the listeners. It is the intention of "Furthermore, the broadcasting the government to create a commit- companies give the largest part of tee who will supervise the broadcast their surplus to the Reicharundfunking programs from the point of view gesellschaft. This is a holding comof culture and aesthetics, and who pany which controls all broadcasting will make certain that the listeners in Germany on uniform principles, and which takes care that the sur-



Colòssal antenna mast of Germany's biggest broadcasting station

were told that if they wished to enter Outlined for Amateurs this new group on an equal basis, re-Speaking on the subject of "Effici- gardless of the individual transbroadcasting has a mission to per- from charge, as in America. In Ger- ency in Transmission" before the mitting apparatus, they might figure form for the whole of civilization many it was therefore necessary to third national convention of the the watts as a total of filament and

people. Therefore, I lay the greatest made possible by the German tele- John H. Miller, electrical engineer Miller, on behalf of the Jewel comstress upon the importance of pub- graphic law which stipulates that a in charge of radio instrument de- pany, announced a contest for all with hand engraved case will be the Miller explained the methods in prize for the member station winning used for attaining distance and voiced the contest. One other condition is

To square up the edge of a panel Dr. Bredow's remarks Mr. Sarnoff "If these tests are satisfactory Ger- Breslaw, Kænigsberg, and bound by might be operated on the most "miles or any other piece of bakelite, use a common wood plane that has been

The Radio Beginners Series

By R. P. Clarkson

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# A Logical Discussion on the Transmission of Power by Radio

### Experimenters Have Been Devoting a Great Deal of Their Time Trying to Solve This Problem

By KENNETH M. SWEZEY

The Radio Beginner's Series

Continued from page five

currents and drain a large B battery in no 1 other tubes. The degree of brightness of

ADIO has sprung unusually fast | As it stands, the system is backwards. | from technical obscurity to a popular utility, through broadcasting, and to many it seems to have reached its limit of perfection and usefulness. Transmitting stations have arisen in numbers sufficient to intermesh their waves in a blanket which covers every acre of the country. Receiving sets are so thick that their antennae spider-web the horizon line. The broadcast programs are in portions of the cycle above the reproach of the most fastidious. What more could one want? What more is pos-

In answer to those questions the echoes of a dozen unsolved problems assert themselves. How can static be eliminated? Who will pay for future broadcasting? When can the owner of a set be freed from technical worry? How can receiving set upkeep be minimized? How can distortion be done away with? What are the limiting factors of super-power?

#### Important Question

The question of who will pay for broadcasting is an old one, and misleading. The people who use the sets, of course. \ always pay; no matter what distribution or collection system is used. It resolves itself to a queston, rather, of how, by what specific means, will the expenses of broadcasting be paid. At present the sale of sets and parts, and of general merchandise through ethereal advertising, pays, but whether this is an ultimate solution is dubious.

As long as the number of broadcasting stations reads in three figures, and the number of radio manufacturers reads in four, there can hardly be a totally satisfactory distribution of toll. Taxing tubes or batteries would not be fair, for who can say that the owner of a single tube set does not have all the services and advantages-in his way-that a broadcasting station could give to the owner of an 8-tube set? Government licensing would be no better, for there would be no way of honestly apportioning the collected money.

If there were but two or three manufacturers—and that is perfectly feasible if apparatus could be sufficiently developed so that it could be standardized-and four or five broadcasting stations for the entire country, the question of payment for broadcasting could be more satisfactorily met. Apparatus could be rented, like Bell telephones, or sold outright, like standard typewriters, and the user could at all times be sure of reliable maintenance service. The several broadcasters could afford to furnish the best of programs, for they would have a definite and continuous source of revenue.

#### Distance Wave May Travel

Undoubtedly, with transmitting and receiving apparatus which we have immediately at hand, this could be accomplished with passable success. But the equipment would be expensive and tremendously limited. Super-power would have to be used at the transmitter, and the sensitivity of the receiving sets increased with the increase in distance. As the distance which a Hertz wave transmitter may cover varies approximately with the square of the power used, it is obvious that the wattage would have to exceed that now in use manyfold. Unless the wave lengths that were used were widely separated, receiving sets within the vicinity of these powerful transmitters would be interfered with beyond remedy.

In true radio fransmission it would seem to the writer that a goodly portion of the transmitted energy should be recoverable. In our present system it is almost a total loss. One could realize this more fully if all receiving sets had only crystals. From the most powerful of modern transmitters scarcely ever can a crystal set receive satisfactorily over more than a hundred miles. If it had not been for the invention of the vacuum tube detector. oscilator and amplifier the entire system would have been long ago pronounced a failure, or at least relegated to a limited commercial and ship-to-ship code service. be used with the same A battery as the

For all the power that is used in the six hundred or so transmitting stations of the country, at least twenty times as much is used in the aggregate of receiving sets. Perhaps this before has been overlooked but it stands out defiantly. Assuming that the six hundred stations broadcast with an average of 1,000 watts, and that two million tube receiving sets consume an average of 6 watts each—which is low, by the way—then a total of 600,000 watts would be propagated and a total of 12,-000,000 watts be used to make it audible at the receivers. ..

#### A Possible Solution

That fundamental weakness is responsible for the necessity of five and eight tube sets-those expensive white elephants which advanced fans must now have in order to meet certain particular requirements. If appreciable power could be conveyed to the receiving set a single tube, or even a crystal, could do the work of an eight-tube super-heterodyne; at the same time securing greater ease of control and less distortion. The works of a set then would need not cost more than \$10 or \$15, and what upkeep expense there was would be chiefly for the actual broadcasting service.

The cost of bare maintenance of a three-tube set-tubes and battery costmay amount to about \$30 a year. Multiply this by two million and we have the figure of \$60,000,000-just for keeping the tubes of the receiving sets lit. It has been said that a broadcasting station cannot keep going on less than \$10,000 a year. Some run as high as \$200,000. For the entire country the broadcasting upkeep costs must run above \$10,000,000 a year.

time. Even as it is, the UX-210 tube with

425 volts on the plate requires as normal

operating voltage a grid battery of 35

volts to hold the plate current down to 22

milliamperes. This plate current is three

or four times what the UV-301A takes on

quarter the voltage without any C battery.

The UX-210, even at 90 volts, has a normal

operating grid voltage of 4.5 volts. The

UX-120, a three-volt tube, with only 135

volts on the plate, requires a normal oper-

ating grid voltage of 221/2 to keep the

plate current down to 6.5 milliamperes.

The UX-112 at 90 volts on the plate re-

quires six volts on the grid. All three of

the new tubes are C battery tubes, while

is a refinement and economy measure

much advocated, but not used by any great

Reducing B Battery Current

Another way of securing amplification

with a minimum of B battery drainage is

the so-called "tone filter amplifier" in (1)

of the figure. Here the coupling between

the tubes is in the millions of ohms,

variable leaks being used both for tube

coupling and for grid leaks. Very low

plate potential is used on the detector and,

pecause of the tremendous resistance of

the coupling, there is substantially no B

hias on either of the next two tubes, but 90

volts on the last tube. The stopping con-

In place of either leaks, resistances,

choke coils or transformers, the writer has

frequently used and suggested coupling

two tubes with a third tube, using the

plate to filament resistance of the third

tube as a coupling resistance, the diagram

being shown at (2). Here we have a de-

tector with one step of straight trans-

former-coupled audio. The first audio

tube is coupled with the second andio

tube through a tube placed between them

as a resister. This tube requires a

separate A battery, as shown. It cannot

percentage of set owners.

densers are .0005 mfd.

If but less than a single watt were | ticular point. The ones that are greatest available at the receiver no tubes would be needed, even for operating a loudspeaker. If energy could be transmitted efficiently a total of 2,000 kilowatts would suffice for all our present needs and could be sent from four super stations of 500,

Then with the best of paid talent the annual cost of both the transmitting and receiving set upkeep could well stay below

But with our present system this is obviously impossible. The waves sent out are chiefly radiations, and because they are such the greatest part of their energy is irrecoverably lost.

#### Beam Transmitter

By concentrating the waves into a beam the recoverable energy is increased, but in the same degree the usefulness as a broadcast transmitter is decreased, for the area over which the waves may be intercepted is restricted.

It is this lack of power weakness that is also the main cause of static trouble. Atmospheric electricity will always be with us, and its nature is so closely allied to that of radio waves that it cannot be eliminated in any practical way so long as its intensity approaches and exceeds that of the impulses that are wanted. The only satisfactory solution to the problem seems to be in increasing the available power at the receiver.

The transmitter may be likened to a train announcer, who must send his voice across a noisy railroad terminal. The distinctness with which he can be heard in any part of the building depends solely upon the relative intensity of the voice waves and the noise waves at that par-

the filament will regulate the resistance

from plate to filament and also, if de-

sired, the resistance be increased or de-

creased by use of a C battery or a poten-

condenser should be large as in resistance

This is a novel use for the tube. The

90 volts shown not only biases the plate of

the resistance tube, but it passes through

the tube and applies on the plate of the

first audio tube. Of course, instead of 90

benefit. Moreover, it is not essential to

have a stage of transformer coupling

precede this, and next week we will

finally come around to the constant cur-

rent amplifier, which is based on this

simple tube resistance coupling with pro-

visions for impressing a signal voltage

on the resistance tube. At that time also

we will reprint the diagram for a push-

Many times in the past we have printed

the diagram for choke coil amplification.

This is identical with the last two dia-

grams of last week's page, except that

choke coils are used in place of resistance

couplings. Many devices have been im-

pressed into use as choke coils for this

purpose. The secondary of an audio trans-

former, the primary of a bell ringing

transformer, the Ford spark coil, various

magnet windings, have all been used.

Probably better than any of these is an

audio transformer with primary and

secondary connected in series aiding,

making one coil of the two. You will have

to reverse the connection between primary

and secondary to be sure they are in the

right order, but it makes no difference

which end is connected to B battery and

which to plate. A blocking condenser and

a leak must be used as in resistance

pull amplifier to complete the record.

will work well.

always win.

Distortion, too, is due chiefly to a lack of antenna energy in the receiving set, for it comes through the inaccurate repeating of regeneration, through small differences in tube characteristics and through interstage transformers. If there was the energy available at the antenna that is now available at the output of the last tube the amplifier could be eliminated, and with it the distortion that it produces.

One often reads in the press the announcement that some one at last has found means to send power by radio. If it were true the industry of the world would be revolutionized. As facts stand, this has not as yet been practically accomplished. Lamps can be lit by the radiations of the ordinary transmitter over very short distances, but the efficiency is so extremely small that commercial promotion of the phenomenon would be ridiculous.

Nikola Tesla was the first to try to solve the problem, and if success is ever achieved it will doubtless he hy his system, into which he has put so much tireless labor. Professor Helmholtz, Lord Kelvin and a number of able contemporaries believe the plan entirely feasible if apparatus could be developed to generate and control the proper kind and intensity of electricity. Tesla has long since done this, and the system seems only to await its application.

The system makes use not of radiation but of true conduction, substituting the earth itself for the wire. That the earth is a conductor is demonstrated by the fact of its extensive use as a telegraph return wire and as the ordinary radio ground connection. Tesla claims it to be a perfect conductor.

The average layman, and electrician as well, is so accustomed to using two wires to connect oll his apparatus that he is, likely to ask where the return wire is in Tesla's system. There is none, and for the reason that there need be none. By using alternating currents of proper frequency and correctly proportioning the circuits lamps may be lit and motors run by means of a single wire with no return.

This is easily demonstrable with the common Tesla resonant transformer or tiometer, as shown dotted, or the grid need Tesla coil. A bank of lamps may be lit not be connected at all. The stopping or wires melted by attaching one terminal to the coil and the other to an insulated coupling, upward from .5 mfd. to 2 mfd. capacity, such as a metal plate or sphere. The capacity serves as a sort of reservoir. being preferable, although as low as .01 which is filled and drained with the alternations of current.

#### Pumping System .

In his radio transmitter Tesla mounts a huge capacity, having ideal enveloping surfaces that prevent radiation, on top of a tower and starts up an electrical pumping system, pumping electricity into and out of the earth. The pressure distributes itself over the entire globe as though it were a sphere of but moderate dimensions, and by using receiving apparatus at different parts of the world. connected at one end to the earth and at the other to a similar but smaller capacity. the energy can be recovered with small loss. Distance need not be reckoned with any more than it need be reckoned in a wire circuit with negligible resistance

If Tesla's system works as well practically as it does theoretically its adaption to broadcasting will go far toward relieving all those problems which were first suggested. It would permit of superpower transmission, with all of the good qualities and none of those that now put a limit to its effectiveness.

Notwithstanding the development of hundreds of new circuits, there has not been a single basic and radical improvement on our present radio system since De Forest invented the three-element vacuum tube. Props have been designed and both transmitting and receiving sets have been pushed to the limits of their capacity, but as for something really new it has yet to appear. The condition is a definite indication that the point of the flattening of the curve has been reached.

amplifiers, that is, the amplifiers that increase the volume of the detector output. It cannot be stated too strongly that this part of the set has nothing to do with radio. The same amplifier, prop-

different forms of audio frequency

erly arranged, will increase the volume of any sound. It is an electric magnifying device which takes the electric output of the detector tube and makes it great enough for the operation of a speaker. The same type of amplifier is used for speech amplification to make the deaf hear, to carry the words of an orator to the crowd, to announce trains in the subway and in railroad stations, and there is even an attachment for the ordi-

nary telephone of the same type, used for the purpose of amplifying telephone conversation.

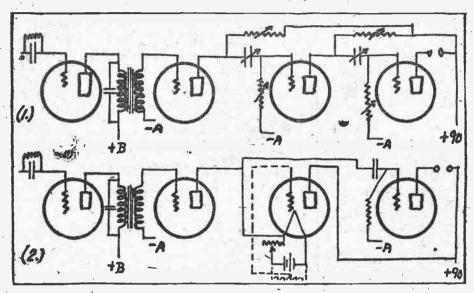
It is rather strange that sound amplification, the amplification of a sound as a sound, does not seem to have been accomplished in any case that the writer can recall, with the exception of the Helmholtz resonators for individual notes. We have sounding boards and sounding boxes (for tuning forks), but these are mechanical amplifiers. The present cone types of speakers resemble this type of amplifiers. In place of a small vibrating body moving the air to make a sound, the small vibrator moves a light body with a large air surface, thus creating a larger air disturbance and more sound. For example, the vibration of the tuning fork is communicated mechanically by contact to the side of the sounding box which has many times the air contact which the fork possesses. That sets up a bigger air wave. In the ordinary speaker the diaphragm is very small and sets up a small air disturbance by itself. Put at the base of a horn which concentrates this air motion, there is a multitude of complicated actions, depending on the horn design. In the cone type of speaker the diaphragm is omitted, but, in effect, the action is as though the small diaphragm were connected to the cone and transmitting its vibration to the cone which has a larger surface. I say the diaphragm is omitted. It is not omitted It is merely changed in its physical form and is now a vibrator, which is exactly what a diaphragm is anyway. The differ-

AST week we started to discuss the merely to vibrate but also to communicate | last tube, or at least what should be that vibration to the air. With the cone speaker, the cone is not the diaphragm but performs the function of communicating the vibrator movement to the air. The vibrator and the cone together take care of the action performed by an ordinary speaker diaphragm.

In an audio amplifier, there is a real increase in energy. There is really amplification. In no form of horn or speaker, except a battery speaker, commonly called a power speaker, is there any increase in energy by reason of speaker action. There

greater, is the B current variation. The fluctuation in B current is what operates the speaker and it is this fluctuation which operates the transformer. It is current fluctuation which is amplified, although the tube is a voltage amplifying device. Voltage variation must be impressed on the grid, but it is current fluctuation which causes the changes in

When current flows through a resistance or impedance there is a voltage drop across that resistance or impedance. If is infinitely less energy in the sound given the resistance or impedance remains con-



The wiring diagrams for the audio-frequency amplifiers referred to in the above article

out than there is in the electrical input. I stant the voltage-drop across it with vary-The efficiency of the speaker in many cases is less than one per cent and never more than just a few per cent. That is, for every unit of electrical energy input, there is a sound output of may be onefiftieth of a unit, more or less. This is true with a power speaker, but there is considerably more electrical energy put in than what comes from the last tube .-

In the amplifier, the added energy comes from the B battery connected to the amplifying tubes. There is no more appreciable B battery current flow in the last tube than there is in the first. Frequently, if a C battery is used, the B cur- it must be very small per unit of cross rent of the last tube is less than that of section. This is one reason for the in-

ing current, varies exactly as the current varies. If the impedance changes as the current changes, the voltage does not vary with the current exactly. This is the case with a transformer. The impedance of a transformer winding does not remain constant, but changes, depending upon the frequency of current fluctuation. Not only that, but the secondary output voltage does not vary exactly with the primary current fluctuations unless the magnetic flux induced in the iron core by the primary current happens to fulfill certain conditions, among which is the fact that ence is that the diaphragm is shaped, not | the first tube. What is greater in the | crease in the size of transformer cores.

Remembering that it is the plate current fluctuation which counts, we can see that the actual amount of plate current which flows seems to have nothing to do with the amplification. It is just waste current. It does not induce any voltage in a transformer secondary. It might just as well not be there. It can be partly done away with by using sufficient C voltage on the grid. The higher the negative voltage bias on the grid of an amplifier the greater will be the impedance to plate current flow and, in general, there will be no decrease in the fluctuation of the current which does flow. In general there will be no decrease. This is not always a safe inference, for the reason that changing the grid bias of a tube shifts the point on the curve at which the tube is operating and may bring it to a point where the curve is not as steep; that is, where the tube is not so good an amplifier. In that case volume will be decreased. The remedy for that is to continue to use the C battery, but to increase the B battery voltage. Increasing the B battery voltage not only makes the curve steeper, but also shifts it sideways so that, for example, a point which was over at zero grid bias is now at minus or minus 2 grid voltage. A good steep part of the curve which has been at positive 2 volts may now be at zero and with a little more increase in B voltage may be shifted over to negative where the C battery would let you take advantage of it.

You can rest assured that wherever a C battery is used you will save B battery current over what the same B voltage without C bias would normally give. It will also permit you to use higher B voltages and obtain more volume, using no more B current than with the lower B voltage and no grid bias. But you must adjust your B voltage pretty much to your grid bias if you use one, and by juggling the two obtain the steepest part of the curve of the tube for greatest amplification. On the new tubes of the UX type the C battery will take on a verv important relation because the tubes are of such low plate resistance that without grid bias they would use enormous plate

Continued on page eight

### And I Learned About Radio From Him

Continued from first page

was it a guffaw? She turned and then, darn the thing, I forgot that she had to be straightened out again. Like an old war horse on a frolic, Lizzie made a complete semicircle, and started to mount the hill again. Her poor old lungs were not quite equal to the strain, however, and she stopped, gasping. I looked about for hubby and found him on his knees on the floor. I still maintain he was praying but he insists he was only trying to reach the

Anyway, the following evening, when I suggested another driving lesson, hubby led me gently to the radio set.

"Here," said he, "is something you can try your mechanical tendencies on without risk of life and limb. Suppose you learn to tune the radio. It will be a comfort to you and perhaps encourage you to stay at home evenings instead of driving around in irresponsible flivvers."

Well. I have always been interested in seeing the funny little dials being turned to produce sweet music, so. I consented. Our receiver is a regenerative one.

don't know just what that means except that all the power that causes the music does not come out in sound. Some of it is fed back and amplified some more to make the music still louder, or perhaps to bring it from greater distances. This is all very well when you can manage it. gently, but when you turn the dial too far or give the set too much gas, it acts like Lizzie, only, instead of snorting, it howls and squeals like the dickens. This is not only a source of annoyance to yourself but causes all the neighbors to use profane language when speaking of you.

Of course, hubby is very smart, but I have seen radio sets before, so when he suggested that I learn to tune, I just slammed in the plug and gave the righthand dial a good, healthy twist. An un-

earthly yowl rent the air. Hubby yanked | Remembering the instructions about gowar dance, rubbing his offended ears the

"Now," said he, "let's get the theory of this straight first. This right-hand dial is the thing you want to monkey with last. First, get your filaments lighted, then tune in your station, then amplify the output to the proper point."

All this sounded simple enough. It's like having somebody teach you to drive by saying, "Just jump in the car and go." "Continue." I said, as respectfully as possible: "what's it all about?"

"The brightness of the tubes," went on the professor. "is controlled by the filament rheostat."

"The which?" I asked, blankly. "T is filament rheostat," he answered, pointing a little knob out to me.

I immediately seized it and gave it a good twi The tubes lighted up fine, just as he said they would, but apparently this did not satisfy him.

"These tubes," he said reprovingly, "are used for radio reception. They are not supposed to furnish light to do your knitting by. The thing you want to learn about all these dials is to go slow. Just barely light the tubes; then, if results are not loud enough, turn the rheostat a little more. Having the tubes too bright only wastes battery current and does not give as good quality."

Accordingly I turned the rheostat back again to a point where the tubes hardly gave any light at all. "Now," I inquired, "where do we go from here?"

"The first two dials, those on the lefthand side, are used to tune in the station." I took one of them gently in each hand.

the plug out and executed some sort of | ing slow, I twisted them gently back and forth. First I twisted them toward each other and then I twisted them away from each other; then I turned them both in the same direction. Only a few faint squeals resulted. Then I tried twisting first one and then the other. Soon I had tuned in a soprano singing "Annie Laurie" and a bass barytone rendering "Rocked in and turned it forward in an effort to clarify matters. The air was filled with shrieks, howls, wails, barks and whistles.

> Then my instructor came to my rescue. "Thank heaven," he said, "that nobody knows who is doing this. There are probably 1,000 radio listeners within a mile of here who feel like committing murder. Too much regeneration in a regenerative set is like too much gas to a flivver It causes a lot of noise and annoyance, but no extra mileage."

"Now," he continued, "let us first turn this dial that does the amplyfying down to zero." We did so.

"Next, let us get these first two dials down low and work them up little by little. Just turn them slowly from each little marking to the next very slowly and stop and listen after each little turn,"

So we started way down at zero and slowly turned the dials together. Soon WJZ was heard faintly, but perfectly, and without interference.

"Now," said hubby triumphantly, "turn the third dial slowly until you get the proper degree of amplification." I turned it and the voice of WJZ's

announcer was drowned in a piercing "The noise," remarked hubby scarcas-

tically, "is not caused by a murder that has just been committed at the studio. It is due to faulty tuning in your own receiver. I am sure radio listeners for several miles around are enjoying it as much as you are."

Properly squelched, I turned the dial back again and started it forward more gently. At last I had the trick. Perfect reproduction!

Then I started all over with my third dial at zero and the other two low down far from soothing. I seized the third dial Another station. It was so fascinating tuning in my own stations that I could have stayed up all night just gently twisting those magic dials.

I got good at it, too, after a few nights' practice. Even hubby said so, and when your husband says you are a good girl you are good! Why, I got the Coast the other evening, all unaided, and that isn't any fish story either. Moreover, there wasn't a squeal. I did it just by turning my dials the tiniest little bit at a time and listening after each little turn. My. but it's fun!

So the secret of tuning, and perhaps you can show how smart you are by showing it to your friends, is to go slow, throttle down the engine and just creep along. Have your tubes dim and sava the current. Incidentally, the tubes will last longer, too. Keep the amplifier low down, because too much amplification means distortion, and turn your dials slowly. Perhaps you will surprise yourself by bringing in some new stations when you get this stunt.

I'm getting to be a real radio bug, now that I've got it, and hubby thinks I'm almost intelligent enough to learn to drive the flivver, and just as soon as he can get some more life insurance he is going to let me try again.

# The Herald Tribune Daily Broadcasting Programs for Week Ending September 12

#### TO-DAY

\* PALLOANING STEEDAY PALOTE STEED STEED

WJZ-NEW YORK CITY-455 comic stories.

10:40 a. m.—Chimes from Grace Church.

11 a. m.—West End Church services.

2:30 p. m.—Sunday Radio Forum.

4 p. m.—Mario Caiati, cellist.

7 p. m.—Nathan Abas's Orchestra.

8 p. m.—Scores; news.

8:05 p. m.—Harry H. Schyde, basso;

8:20 p. m.—Captain Charles H. Longbottom harn. 8:20 p. m.—Captain Charles R. Longto-tom, harp. 8:35 p. m.—Harry H. Schyde, basso. 8:50 p. m.—Lafayette Day talk. 9 p. m.—Lakewood Farm Inn Ensemble. 10 p. m.—Godfrey Ludlow, violinist. 10:35 p. m.—News.

WJY-NEW YORK CITY-405 8:15 p. m.—To be announced. 9 p. m.—Rosalie Wolf, soprano. 9:15 p. m.—Bert Holand, pianist. 9:30 p. m.—Gladys Thomas, contratto. WEAF—NEW YORK CITY—492 p. m.—Sunday Hymn Sing. 5 p. m.—Interdenominational services. Address by Rev. James Myers; Federa-

tion Quartet.
7:20-9:15 p. m.—"Capitol Gang."
9:15-10:15 p. m.—Musical vespe WGBS-NEW YORK CITY-316 3:30 p. m.—Warner's Theater program.

p. m.—Comfort's Philharmonic Orchetra; Veselli's Band.

WHN—NEW YORK CITY—361 m.—Marsh McCurdy, organist. m.—Roseland Dance Orchestra. WMCA—NEW YORK CITY—341
11 a. m.-12:15 p. m.—Christian Sc 11 a. m.-12:15 p. m.—Christian services. 7-7:35 p. m.—Ernie Golden's Orchestra. 9-10 p. m.—Symphony orchestra.

WNYC-NEW YORK CITY-526 8:50 p. m.—Baseball results. 50 p. m.—Baseball results.
p. m.—Program from stage and studie of Brooklyn Strand Theater. WFBH—NEW YORK CITY—273

5 p. m.—Church choir singers.

5 p. m.—Betty Smith's artists.

6 p. m.—Masonic news.

6.16 p. m.—Murray Schwartz, planist.

6.20 p. m.—Bossert Lumberjacks.

7 p. m.—Orchestra.

WGCP—NEWARK—252

B. p. m.—Charlotte Trystman, planist.

S:15 p. m.—Sylvia Miller, soprano.

S:30 p. m.—William Timmon, tenor.

S:45 p. m.—Ralph Hersh, violinist.

p. m.—Lillian Gordone, contralto.

WIP—PHILADELPHIA—508
10:45 a. m.—Morning services,
4:15 p. m.—Musical services. WPG—ATLANTIC CITY—300
4:15 p. m.—Vocal and instrumental rec
9 p. m.—Concert orchestra.
11 p. m.—"Favorite Italian Melodies."

WHAR-ATLANTIC CITY-275 . m.—Sacred recital.
. m.—Sermon, the Rev. S. W. Steckel.
. m.—Evening service.
...—Seaside Hotel Trio. 11:15 p. m.—Strand organ recital. WRW-TARRYTOWN-278

10:30 p. m.—Concert. 11:05 p. m.—Musical program. WGY—SCHENECTADY—380

10:45 a. m.—Servica.

5 p. m.—Musical program.

8:45 p. m.—Lakewood Farm Ensemble.

10 p. m.—Godfrey Ludlow, violinist. WGE-BUFFALO, N. Y.—319
10:30 a. m.—Morning service.
3 p. m.—Vesper services.
WHAM—ROCHESTER—278

WJAR-PROVIDENCE-306

WMAF—80. DARTMOUTH—441 m.—Comfort's Orchestra; Vesselli's WEEL-BOSTON-349,

7:20 p. m.—"Capitol Gang." 9:15 p. m.—Musical yespers. WBZ-SPRINGFIELD, MASS.-833 p. m.—Dorothy Curtis, planist; Elmer Curtis, cornetist. 9:30 p. m.—Organ music. 10 p. m.—A. Canata, cornetist. WCTS-WORCESTER, MASS,-268

7:20-9:11 p. m.—Capitol Theater Gang 9:15 p. m.—Musical vespers. WCAP-WASHINGTON-469 12 noon—Service.
5 p. m.—Service.
7:20-9:15 p. m.—"Capitol Gang."
9:15 p. m.—Musical vespers.

KDKA—PITTSBURGH—309
10:45 a. m.—Church service.
6 p. m.—Baseball scores.
8 p. m.—Interdenominational service. WCAE-PITTSBURGH-461

#### MONDAY

4:30 p. m.—Josiah B. Free, barytone. 4:45 p. m.—Victoria and Mary Regalbuto,

4:45 p. m.—Victoria and Mary Regalbuto, duets.
6 p. m.—Dinner music.
7 p. m.—Lemuel Kilby, barytone.
7:16 p. m.—Norman Curtis, pianist.
7:80 p. m.—Light Opera Quartet.
7:45 p. m.—Norman Curtis, pianist.
8 p. m.—Colonial Aces Hawaiian Trio.
8:15 p. m.—WEAF Light Opera Quartet.
8:30 p. m.—United States Army Band.
9:15 p. m.—'Labor Day Message," Hon.
Theodore Risley.
9:35 p. m.—Gluseppe dl Benedetto, tenor.
9:50-11:30 p. m.—Dance music.
WJZ—NEW YORK CITY—455

WJZ-NEW\_YORK CITY-458 1 p. m.—Meyer Davis's music. 2-4-5:20-8-11:30 p. m.—New York news. 4-6 p. m.—Scores, racing results (he

b p. m.—Scores, ... hourly).

10 n. m.—John Daniel, readings. m.—News, scores, racing results. m.—Market reports. p. m.—Market reports.
p. m.—Financial summary.
p. m.—Baseball, racing returns.
p. m.—U. S. Navy Band.
p. m.—Organ recital.
m.—Scores, racing results.
p. m.—''Aida,'' Boston Opera Com-

WGBS-NEW YORK CITY-316 WGBS—NEW YORK CHIL—310

1:30 p. m.—Scripture reading.

1:35 p. m.—Mme. Rose Kraus, soprane.

2 p. m.—Bobby Roth, planist.

3 p. m.—Interview with Elizabeth Bellairs.

3:10 p. m.—Joseph Herrick, John Gates, humor and music.

3:40 p. m.—Leroy Montesanto, tenor.

6 p. m.—Uncle Geebee.

6:30 p. m.—Premiere Orchestra.

wMCA—NEW YORK CITY—341
6:30 p. m.—Ernie Golden's Orchestra.
8 p. m.—Lecture on Christian Science.
9-10 p. m.—Symphony orchestra.
10-11 p. m.—To be announced.
11-12 p. m.—Dance orchestra.
WNYC—NEW YORK / CITY—528

4 p. m.—Franz Kaltenborn's Orchestra. WAHG—RICHMOND HILL, N. Y.—316 htg-Richmond Hill, N. Y.—31
p. m.—Sport talk.
p. m.—William Morgan, planist.
m.—Mrs. Paul V. Allen soprano.
p. m.—Horace Taylor, readings.
p. m.—Synchrophase Trio.
m.—Mrs. Paul V. Allen, soprano.
p. m.—William Morgan, planist.
p. m.—Synchrophase Trio.
m.—Dance orchestra.
p. m.—Dance orchestra.
a. m.—Special musical program.

WRNY—NEW YORK CITY—258

12:02 p. m.—Trio; concert.
1 p. m.—Radio industry hour.
1:02 p. m.—Sports forecast.
1:10 p. m.—Studio program.
7 p. m.—Sports results.
7:10 p. m.—Commerce of the day.
7:20 p. m.—Code lesson.
7:50 p. m.—Luilaby Lady.
8 p. m.—Evolution of Jazz."

7:50 p. m.—Lullaby Lady.

8 p. m.—"Evolution of Jazz."

8:15 p. m.—Old time medley.

8:30 p. m.—American Painter Series.

8:45 p. m.—Jazzing classics.

9 p. m.—"Radio," Hugo Gernsback.

9:45 p. m.—New production songs.

10 p. m.—Poetry Post.

10:10 p. m.—The Piano Dances.

10:25 p. m.—Bernie's Dance Orchestra.

WHAP—BROOKLYN—240
8:30 p. m.—Concert wbbr-staten island-273

8:40 p. m.—Vocal solos.
8:40 p. m.—Bible instruction.
8:50 p. m.—Syrian Oriental music.
WOR—NEWARK—405
6:45-7:15-7:45 a. m.—Gym class.
2:30 p. m.—Taik, Willard Robison.
2:45 p. m.—Edward S. Breck, planist.
3 p. m.—Willard Robison.
3:15 p. m.—Edward S. Breck, planist.
3:30 p. m.—Melvin Nadelweiss, whistler.
1:15 p. m.—"Words Often Mispronounced."
1:17 p. m.—Walle Osborne's Orchestra.
1:15 p. m.—"Sports," Pat Robinson.
30 p. m.—Perry and Russell, songs.
p. m.—Dr. George Little.
15 p. m.—Welody Four.
10 p. m.—Edward H. Bierstadt, editor.
11 p. m.—Sol Sabino, mandolin.
12 p. m.—Melody Four.
13 p. m.—Sol Sabino, mandolin.
14 p. m.—Melody Four.
15 p. m.—Sol Sabino, mandolin.
16 p. m.—Melody Four.
17 p. m.—Sol Sabino, mandolin.
18 p. m.—Leo Carrillo, "Timely Toxian Mandolin.
19 p. m.—Leo Carrillo, "Timely Toxian Mandolin.
10 p. m.—Leo Carrillo, "Timely Toxian Mandolin.
11 p. m.—Leo Carrillo, "Timely Toxian Mandolin.

WGCP—NEWARK—252

\$ p. m.—Songs and race results.
4 p. m.—Jack Palmer's Jazz Band.
5:30 p. m.—Sam Williams, Al Piantodosi.
5:45 p. m.—Edyth Pollak.

\$ p. m.—Piano solos.
8:45 p. m.—Francis May, violinist.
9 p. m.—Vincent Lane, tenor.
9:15 p. m.—Lucille Wolf, soprano.
9:30 p. m.—Eve Rothenberg, pianist.
9:45 p. m.—Raymond Maher, barytone.
10 p. m.—Polla's Orchestra.

Waam—NEWARK—263

WAAM—NEWARK—263

11 a. m.—Happy Hour.
7 p. m.—Joe Brown, tenor.
7:15 p. m.—Jack Wheaton's Orchestra . m.—Sport Oracle. . m.—Jack Wheaton's Orchestra. WOO-PHILADELPHIA-508

45 p. m.—Grand organ; trumpets.
80 p. m.—Dinner music. -Norman Curtis, planist: Ligh 8 p. m.—Norman Curtis, pian:
Opera Quartet.
9 p. m.—Marine Roof Orchestra.
9:30 p. m.—Giuseppe di Benede:
Sadrian String Trio.
10:80 p. m.—Dance music.
11 p. m.—Dance music. WIP-PHILADELPHIA-508

WPG-ATLANTIC CITY-800

director.
4:30 p. m.—Tea music.
6:40 p. m.—Baseball scores; organ recital.
7 p. m.—Trio dinner music.
8:05 p. m.—Ambassador dinner music.
8 p. m.—Traymore Concert Orchestra.
10 p. m.—Kentucky Serenaders.
11 p. m.—Dance orchestra.

p. m.—Dance orchestra.

WGY—SCHENECTADY—389
p. m.—Dinner music.
p. m.—WGY Orchestra; Lucille
ach, soprano.

WGR—BUFFALO—319 m.—Dance orchestra. m.-1 a. m.—Supper music.

WHAZ—TROY, N. Y.—380 m.—Song recital. n.—Dance music. WHAM-ROCHESTER-278 i:80 p. m.—Eastman Thea:
6 p. m.—Theater organ.
8 p. m.—Theater orchestra . m.—Scores; weather. WJAR—PROVIDENCE—306

ean.
p. m.—"Berry Springtime."
WTIC—HARTFORD, CONN.—476

7 p. m.—Dinner music. 7:30 p. m.—Weather report; scores. 7:55 p. m.—Dinner music. WEEL—BOSTON—349

WEEI—BOSTON—349
6:30 p. m.—Big Brother Club.
7:20 p. m.—Lost and found; scores.
7:30 p. m.—Stanley Greenlaw, musical sa 8 p. m.—Musical.
8:45 p. m.—Ed Andrews's Orchestra.
WBZ—SPRINGFIELD, MASS.—333
7 p. m.—Capitol Theater Orchestra.
9 p. m.—Helen Studzinska, violiniste.
9:30 p. m.—Copley Plaza Orchestra.
10 p. m.—Gordon Graham, tenor.
10:15 p. m.—Irene Shelley, planiste.
10:30 p. m.—Market report; book review

10:30 p. m.—lrene Shelley, planiste.
10:30 p. m.—Market report; book rev
WCTS—WORCESTER—268
10:30 a. m.—Chats.
12-2 p. m.—Luncheon music.
4:15 p. m.—"Canning Hints."
7:15 p. m.—Story teller; scores.
WRC—WASHINGTON—469
10 a. m.—Women's hour from WJZ.
12:55 p. m.—Washington-Philadelphis
ble-header broadcast.
6 p. m.—United States Navy Band.
WCAP—WASHINGTON—469
8:30-11 p. m.—Special Labor Day ce

WCAP—WASHINGTUN—469

8:30-11 p. m.—Special Labor Day celebration; U. S. Army School Band; community singing; prominent speakers,
11 p. m.—Washington Post hour,

KDKA—PITTSBURGH—309 3:80-7 p.m.—Scores, ose Band; songs. 9:45 p.m.—Westinghouse Band; songs. WCAE PITTSBURGH—461 6:30 p. m.—Baseball scores. 7:30 p. m.—Uncle Kaybee. 9 p. m.—Concert. 11 p. m.—Dance music.

TUESDAY

WJZ-NEW YORK CITY-455 a. m.—Women's program. a. m.—News service.

11 a. m.—News service.
1 p. m.—Nathan Abar's music.
2, 4, 5:20, 7:50 and 10:55 p. m.—News.
4-6 p. m.—Scoras; racing results (half hourly).
4:35 p. m.—Violano Virtueso, recital.
5:20 p. m.—News; scores; racing results.
5:26 p. m.—Market reports.
5:50 p. m.—Financial summary.
6:01 p. m.—Baseball: racing returns. 5:50 p. m.—Financial summary.
6:01 p. m.—Baseball; racing returns.
7 p. m.—Dog talk, by Frank Dole, of the Herald Tribune.
7:15 p. m.—Vanderbilt Orchestra.
7:50 p. m.—Scores; racing results.
8 p. m.—Over the Seven Seas.
8:30 p. m.—Program from Landay Hall.
9:30 p. m.—The Texans.
10:10 p. m.—Jan Weber, cellist.
11 p. m.—Mayflower Orchestra.

WNYC-NEW YORK CITY-526 WNYC-NEW YORK CITY-526
6:30 p. m.—'Home Economics."
6:45 p. m.—Mabel Eberth, contraito,
7 p. m.—Market high spots,
7:10 p. m.—The Canadians, dance musi
7:30 p. m.—Police alarms.
8 p. m.—'Baseball Problems'; scores,
8:15 p. m.—Fire Department Band.
10:15 p. m.—Trend of the Times."
10:30 p. m.—Police alarms. WEAF—NEW YORK CITY—492 6:45-7:45 a. m.—"Health Exercises," 11 a. m.—Claude Lapham, pianist. 1:10 a. m.—Lecture; music, 1:35 p. m.—"Mofion Picture Forecast." (0 a. m.—Music. noon—Market and weather reports, in—Mrs. La Rue Nelson, soprano. p. m.—Theresa Ferrentino, pianist, p. m.—Women's Program."

6 p. m.—Dinner music.
7 p. sm.—Music al program.
7:10 p. m.—Columbia lecture.
7:30 p. m.—Edward Steele, pianist.
8 p. m.—Dudley Fowler:
6:10 p. m.—Ross Gorman's Orchestra.
8:30 p. m.—'The Gold Dust Twins."
9 p. m.—'Eveready Hour."
10 p. m.—Grand opera, "Mignon."
11-12 p. m.—Vincent Lopez's Orchestra. WJY-NEW YORK CITY-405
7:30 p. m.—Ambassador Trio,
8:15 p. m.—Zoological Society series.
8:30 p. m.—Joint recital.
9:15 p. m.—Sport talk..

WGBS-NEW YORK CITY-816 1:35 p. m.—Blossom Heath Serenaderi
3 p. m.—Interview with Wheeler Dry
3:10 p. m.—Clare Collins, pianiste.
3:20 p. m.—Clare Collins, pianiste.
3:30 p. m.—Clare Collins, pianiste.
3:40 p. m.—Plano lessons; songs.
6 p. m.—Uncie Geebee.
6:30 p. m.—Vincent Sorey Orchestra.
7 p. m.—Meyer Davis's Orchestra.
7:30 p. m.—Arrowhead Orchestra.
8 p. m.—Paul Gallico, synthetic fight.
8:10 p. m.—Frederick Bowers, songs.
8:30 p. m.—Japanese program.
9:30 p. m.—Stamboul Trio.

8:10 p. m.—Japanese program.

9:30 p. m.—Stamboul Trio.

9:40 p. m.—Joseph Halligan, sorga.

9:50 p. m.—Stamboul Trio.

10 p. m.—Melody Four.

10:10 p. m.—Stamboul Trio. 0 p. m.—Melody Four.
0:10 p. m.—Stamboul Trio.
0:20 p. m.—Melody Four.
10:30 p. m.—Meyer Davis's Orchestra.
11 p. m.—Arrowhead Orchestra.
11:30 p. m.—Interview with Ruth Nugen and J. C. Nugent.

WMCA-NEW YORK CITY-341 WMCA—NEW YORK CITY—341
11-12 a. m.—Ida Allen's hour.
6:30 p. m.—May Breen, ukulele.
7 p. m.—Jack Wilbur's personalities.
8 p. m.—Musicale.
8:30 p. m.—Columbia Orchestra.
9 p. m.—Dance orchestra.
10 p. m.—Hour of music,
11-12 p. m.—Ernie Golden's Orchestra. WEBJ—NEW YORK CITK—273
p. m.—Amphion's Dance Orchestra,
30 p. m.—Frank Cork's Orchestra,
p. m.—Talk, Garrow Geer.

3 p. m.—Talk, Garrow Geer. 3:10 p. m.—Beatrice MacCue, contralto 8:30 p. m.—Pryor's Concert Band. WENY—NEW YORK CHTY—253

12:02 p. m.—Trio concert.

1 p. m.—WRNY hour.

1:02 p. m.—Sports forecast.

1:10 p. m.—Sports forecast.

1:10 p. m.—Sports results.

7:10 p. m.—Commerce of the day.

7:20 p. m.—Law series.

7:45 p. m.—Theatre costume.

8 p. m.—Orlando's Concert Orchestra.

8:15 p. m.—Light opera series.

9 p. m.—Wotor Camp Sitea."

9:15 p. m.—Old musical comedies.

9:30 p. m.—Architectural series.

9:35 p. m.—Orlando musical comedies. WRNY-NEW YORK CITY-253

WHN—NEW YORK CITY—S61

12:30 p. m.—Warsh McCurdy, erganist,
2:15 p. m.—Vaudeville and overture.
3:15 p. m.—Lexington Theater Orchestra.
4:30 p. m.—Uncle Robert's chat,
4:35 p. m.—William E. Grimshaw, solos,
5 p. m.—Pearl Ettmann, soprane.
7:30 p. m.—Oakland's Chateau Shanley.
8 p. m.—(Colonial Aces."
8:20 p. m.—Bob Miller, Lewis Plotti, songs.
8:45 p. m.—Clementine Rigo, soprano.
9 p. m.—Talk on "Florida."
9:10 p. m.—Iving August, planist.

9 p. m.—Talk on "Florida."
9:10 p. m.—Irving August, planist,
9:20 p. m.—Ed. E. Holle, barytone.
9:30 p. m.—Palisades Orchestra.
10 p. m.—Ralph De Wolfe, tenor.
10:15 p. m.—Eve C. Trighy, soprane.
10:30 p. m.—Roseland Dance Orchestra.
11:30 p. m.—Silver Slipper Orchestra. WOKO—NEW YORK CITY—233 8:30-11 p. m.—Bike races; Joa Re-Band.

WFBH-NEW YORK CITY-273 2 p. m.—Orchestra.
2:50 p. m.—Chin Lee Orchestra.
3:30 p. m.—Studio program.
4:55 p. m.—Baseball scores (quarter hourly).
4:05 p. m.—Richard Hitters's Orchestra.
5 p. m.—Knickerbocker Hospital, talk,
5:15 p. m.—Eddie Meredith, Nat Osborne,

5:30 p. m.—Jack Fagan's Radio Frolic. 6 p. m.—Esther Brankin, soprano. WHAP—BROOKLYN—240

WAHG-RICHMOND HILL, N. Y. 816 12:30 p. m.-Musical program. 12:30 p. m.—Musical program.

WOR—NEWARK—405
6:45-7:15-7:45 a. m.—Gym class.
2:30 p. m.—Edward South, barytone.
2:45 p. m.—Ottlile Winn, soprano.
3 p. m.—Edward South, barytone.
3:15 p. m.—Jack Smith, entertainer.
3:30 p. m.—H. Jeferson Reid, readings.
3:45 p. m.—Ottlile Winn, soprano.
6:15 p. m.—Words Often Mispronounced.
6:17 p. m.—San Carlos Dance Orchestra.
6:30 p. m.—'Man in the Moon' stories.
7 p. m.—Dance orchestra.
7:15 p. m.—'Sports,' Pat Robinson.
WGCP—NEWARK—252

WGCP-NEWARK-252 race results.

race results.

- WAAM—NEWARK—263

11 a. m.—Happy Hour; cooking lesse

7 p. m.—Lester Coburger, pianist.

7:15 p. m.—W. M. Emery, barytone.

7:35 p. m.—Peral Ryno, soprano.

8 p. m.—Paragon Orchestra.

9 p. m.—Violin, harp and piano.

9:30 p. m.—Helena Parrell, soprano.

9:45 p. m.—"Transcontinental Tour."

10 p. m.—Jimmy Shearer, songs.

WIT—PHILADELPRIA—395.

1 p. m.—Tea Room Orchestra.

3 p. m.—Amon Berkheiser, bass.

2:45 p. m.—Eleanor Gunn, fashion fes

6:45 p. m.—Roos garden broadcast.

5 p. m.—Ross Gorman's Orchestra.

3:30 p. m.—The Twins.

o p. m.—Ross Goffman's Orenestra.
8:30 p. m.—The Twins.
9 p. m.—Eveready Hour.
10 p. m.—Opera, "Mignon."
WLIT—PHILADELPHIA—395 2:30 p. m.—Concer.
Hints"; artists.
4:30 p. m.—Artist recital.
WCAU—PHILADELPHIA—278
—Recital.

WCAU--PHILADHIPHIA-278
7:30 p. m.—Recital.
8 p. m.—Kenneth Carney, guitar.
8:30 p. m.—Entertalment.
9 p. m.—Philharmonic Quartet.
10 p. m.—Harry Link, songa.
10:30 p. m.—Billy Hayes's Orchestra.
WOO-PHILADELPHIA-508
11 a. m.—Grand Organ.
12 (noon)—Luncheon music.
4:45 p. m.—Grand Organ, trumpets.
7:30 p. m.—Dinner music.
WIP--PHILADELPHIA-508
7 a. m.—Setting-up exercises.

a. m.—Setting-up exercises.

15 p. m.—'Song of the Surf."

30 p. m.—Comfort's Orchestra.

55 p. m.—Dinner music.

p. m.—Bedtime Story.

p. m.—Comfort's Philharmonic Orches tra.
8:40 p. m.—"Song of the Surf."
8:45 p. m.—Murphy's Minstrela.
9:50 p. m.—Vesselli's Band:
10:05 p. m.—Wovie Broadcast.
10:30 p. m.—Dance music.

10:30 p. m.—Dance music.

11 p. m.—Night Hawks Orchestra.

WPG—ATLANTIC CITY—300

1:30 p. m.—Beauty Pageant; Bahy Parade.

6:45 p. m.—Organ recital.

7 p. m.—Trio Dinner Music.

8:06 p. m.—Ambassador Dinner Cencert.

9 p. m.—Beauty Pageant.

10 p. m.—Beauty Pageant.

11 p. m.—'California Night Hawks."

WGY—SCHENECTADY—380

2 p. m.—Music; one-act play.
2:30 p. m.—Organ recital.
6:30 p. m.—Dinner program.
7:35 p. m.—Studio program.
7:55 p. m.—Travel talk.
8:25 p. m.— WGY Orchestra; Frances
Nearing, soprano.
11 p. m.—W. Spencer Tupman's Orchestra.

WGR-BUFFALO, N. Y.-319 6:30 p. m.—Dinner musica 8-11 p. m.—Program same as WEAF. WTIC—HARTFORD, CONN.—476 7 p. m.—Travelers Jongleurs.
7:30 p. m.—Weather report; scores.
8:10 p. m.—Anna Tatro, contralto.
7:30 p. m.—Organ recital.
8:10 p. m.—Mrs. E. C. Tomkins, soprano.
9:45 p. m.—Dance music. WHAM-ROCHESTER, N. Y.-278

6 p. m.—Eastman Theater organ. 8 p. m.—Eastman Theater organ. 8:80 p. m.—Scores; weather. WJAR-PROVIDENCE-306 10:45 p. m.—Concert orchestra.
2:30 p. m.—Concert orchestra.
2:30 p. m.—Rathskeller Trio.
3:15 p. m.—Address, Hiram Nones.
3:30 p. m.—Rathskeller Trio.
7:35 p. m.—"Music Tawkalog."
8 p. m.—Musical program.
8:20 p. m.—"Stolen Automobiles."
8:30 p. m.—Gold Dust Twins.
9 p. m.—'Eveready Hour."

WEEL-BOSTON-349 WEEL—BOSTON—349
6:45 a. m.—Health exercisea.
6:80 p. m.—Big Brother Club.
7:20 p. m.—Lost and found; scores.
7:30 p. m.—Ruth Leighton, soprano.
8-11 p. m.—Program same as WEAF.
WBZ—SPRINGFIELD, MASS.—333 7 p. m.—Leo Reisman Ensemble.
9 p. m.—James Knox, violinist.
9 ili p. m.—Games Knox, violinist.
9 ili p. m.—Ge's Orchestra.
10 p. m.—Brunswick Orchestra.
10 ili p. m.—Market report.
10 ili p. m.—Market survey.

WCTS-WORCESTER—268

10:30 a. m.—Radio chata.

12 m.—2 p. m.—Luncheon music.

4:45 p. m.—Interesting talk.

5:10 p. m.—Story teller; scores. WRC-WASHINGTON-46

m.—Organ recital.
m.—Mayflower Orchestra.
p. m.—Washington-Philadelphi 2 p. m.—Mayflower Orchestra.

8:25 p. m.—Washington-Philadelphia ball game.

8 p. m.—"Over the Seven Seas."

8:30 p. m.—Musical program.

11 p. m.—Spencer Tupman's Orchestra

KDKA—PITTSBURGH—309

8:30-7 p. m.—Scores. 9:45 p. m.—Page Quartet. 11:15 p. m.—Concert. WCAE.—PITTSBURGH—461 6:30 p. m.—Dinner concert. 8-11 p. m.—Program from WEAF.

#### WEDNESDAY

WEAF—NEW YORK CITY—492 1:45 to 7:45 a.m.—Health exercises. I. a. m. to 12 noon—Young Mother's

11 a. m. to 12 noon—Young Mother's program.

12 noon—Market and weather reports.

4 p. m.—Dorothy Mueller, contraito.

4 j. m.—Thomas Hughes, pianist.

4:30 p. m.—Paul Butler, tenor.

4:35 p. m.—"Holland's Influence on Civilization."

5 p. m.—Dinner music.

7 p. m.—Synagogue services.

7:30 p. m.—United States Army Band.

9 p. m.—"Your Hour."

10 p. m.—Ipana Troubadors.

11 to 12 p. m.—Bossert Marine Orchestra.

WJZ—NEW YORK CITY—455 WJZ-NEW YORK CITY-455

10 a. m.—Women's program.
10:40 p. m.—The Herald Tribune Institute 1a. m.—News. :15 p. m.—Irwin Abrams's Orchestra. .4, 5:20, 8 and 10:30 p. m.—News. o p. m.—John B. Daniel, readings.

5.26 p. m.—Mayket reports.
5.26 p. m.—Market reports.
5.30 p. m.—Pinancial summary.
7 p. m.—Dinner music.
8.10 p. m.—Radio Franks.
8.30 p. m.—Edison hour.
9.30 p. m.—"Bugs" Baer, humerist.
9.45 p. m.—Musicale.
10.35 p. m.—Meyer Davis's Orchestra. WGBS-NEW YORK CITY-31

1:80 p. m.—Scripture reading. 1:35 p. m.—Strand Orchestra. 8 p. m.—Association of Women Painte p. m.—Association of Women Painter and Sculptors; Emily Hatch, soprano.

6. p. m.—Uncle Geebee.

6.30 p. m.—Verkes's Flotina Orchestra.

7.20 p. m.—King Barry, Michael Sto WMCA-NEW YORK CITY-341

WMCA—NEW YURK CITY—341

11 a. m.—Helen Morris, soprano.
11:15 a. m.—"Radiograds of Fashion Fads."
11:45 a. m.—Helen Morris, soprano.
6:30 p. m.—Ernie Golden's Orchestra.
7:45 p. m.—Minnie Weil, planist. . m.-Jack Smiles :30 p. m .- Crescent Male Quartet. WRNY-NEW YORK CITY-258

WEAR — NEW YORK CITY—258

12:02 p. m.—Troi concert.

1 p. m.—Radio industry hour.

1:02 p. m.—Sports forecast.

7 p. m.—Sports results.

7:10 p. m.—Commerce of the day.

7:20 p. m.—Code lesson.

7:50 p. m.—Experience of listeners.

8:10 p. m.—Dr. Spaeth's artists.

8:10 p. m.—John Howard, planist.

8:20 p. m.—Charles Griffith, violinist.

8:30 p. m.—Fiction hour.

8:45 p. m.—Samuel Polonsky, violinist.

9 p. m.—"Radio Batterles," A. P. Peok.

9:15 p. m.—Sculpture series.

9:20 p. m.—Music period.

9:30 p. m:—Aviation series.

9:45 p. m.—Meta Christensen's Quartet.

**Daylight Saving Time** 

WNYC—NEW YORK CITY—526 n.—Elementary Spanish lessons. 3.30 p. m.—Advanced Spanish lessons. p. m.—Market high spots. 7 p. m.—Market high spots.
7:10 p. m.—Dance program.
7:30 p. m.—Police alarms.
7:45 p. m.—Dance program.
8 p. m.—Baseball results.
8:05 p. m.—Herman Neuman, pianist.
8:15 p. m.—Max Bendix's Symphony Of

0:15 p. m.—Andrew Fiedler, George Will harmonica and guitar.
0:30 p. m.—Police alarms; weather. WEBJ—NEW YORK CITY—273
p. m.—Dan Barnett's Orchestra.
25 p. m.—Edith Law, soprano.
26 p. m.—Buson's Troubadours.
26 p. m.—Isabel Henderson, soprano.

2:30 p. m.—Lou Fordon, Billy Mathebies songs.

2:45 p. m.—Carl White's Entertainers.

3:45 p. m.—Jimmy Clarke's Entertainers.

4:15 p. m.—Mae Gooderson, "Poems."

4:25 p. m.—Frank May, violinst.

4:40 p. m.—Jack Smith, barytone.

4:50 p. m.—Alice Rowe, songs.

7:15 p. m.—Cantor Sol Fuchs, Jewisi songs. songs.

/ 30 p. m.—Geraldine Stern, planist.

/ 30 p. m.—Mary Withers, whistler.

8 p. m.—Royal Jazz Band.

8 p. m.—Royal Jazz Band.
8:30 p. m.—Ukulele Lou Hayes, songs.
8:45 p. m.—Fanny Horowitz, pianiste.
9 p. m.—O'Brien Bros., guitara.
3:15 p. m.—Jean Moresco, tenor.
9:30 p. m.—George M. White, cornet sol
9:45 p. m.—Edwin Howland, barytone.
10 p. m.—Roseland Dance Orchestra.
10:30 p. m.—Palisades Orchestra.
11 p. m.—Silver Slipper Orchestra. WFBH-NEW YORK CITY-273

WFBH—NEW YORK CITY—273
2 p. m.—Leo Cummings Orchestra.
3-4 p. m.—Studio program.
4 p. m.—Scores (quarter hourly).
4:05 p. m.—Yama Yama Boys.
4:15 p. m.—Marion Doran, soprano.
4:30 p. m.—Shail America Be Blue.
4:45 p. m.—Gloria Russo, soprano.
5 p. m.—Jerry Antone's Orchestra.
5:45 p. m.—Cameron Emsile, planist.
6:15 p. m.—Majestic String Ensemble.
5:45 p. m.—Baseball resume.
6:50 p. m.—Majestic String Ensemble.
6:50 p. m.—Majestic String Ensemble. 6:50 p. m.—Majestic String Epsemble, 7 p. m.—Bob Ward's Little Wards, 7:15 p. m.—Franklin Four. WAHG-RICHMOND HILL, N. Y .- 316

12:30 p. m.—Almon and Bowes, volume piano.
7:30 p. m.—Sport talk.
7:45 p. m.—Von Der Heide, La Ruffa, piano and banjo.
8 p. m.—James M. Savelle, barytone.
8:15 p. m.—W. Norman Grayson, pianist.
8:30 p. m.—Genevieve Williams, soprano.
8:45 p. m.—Von Der Heide, La Ruffa.
9 p. m.—James M. Savelle, barytone.
9:15 p. m.—W. Norman Grayson, pianist.
9:30 p. m.—Genevieve Williams, soprano.
9:45 p. m.—Herman Fisher, "Julius Caesar."

9:45 p. m.—Herman Fisner,
Caesar."
10 p. m.—Glenn Smith's Orchestra.
11:05 p. m.—Glenn Smith's Orchestra. WOR—NEWARK—405
6:45-7:15 a. m.—Gym class.
2:30 p. m.—Ben Gill, barytone.
2:45 p. m.—Yama Yama Boys.
3 p. m.—Ben Gill, barytone.
3:15 p. m.—To be announced.
3:30 p. m.—Yama Yama Yama

9 p. m.—Albert von Hiller, composer.
9:15 p. m.—Sam Siegel mandolin virtuo:
9:30 p. m.—Talk, Frank G. Wadsworth.
9:45 p. m.—Hour of song.
10:45 p. m.—Gentral Park Orchestra. WGCP-NEWARK-252 6 p. m.—Scores; racing results (half-

6:26 p.m.—Market reports.
5:50 p.m.—Financial summary.
6:01 p.m.—Baseball, racing results.
7 p.m.—Museum of Natural History.
7:15 p.m.—Vanderbilt Orchestra.
8 p.m.—Scores and racing results.
8:10 p.m.—Frank Anderson, barytone.
8:30 p.m.—United States Marine Band.
10 p.m.—Royal hour of music.
11:06 p.m.—Jacques Green's Orchestra;
Clark's Hawailans.

WIVE—NEW VORK COUNTY ANN sons.

8:30 p. m.—Dick and Flo Bernard, songs.

8:35 p. m.—Jack Smith, personality.

9 p. m.—Wm. J. Rietz, songs.

9:15 p. m.—Indianans Orchestra.

10 p. m.—Sam Williams, Al Piantodosi.

WAAM—NEWARK—263

7. p. m.—Elmer Nippes's Orchestra.

7.30 p. m.—Elmer Nippes's Orchestra.

8.15 p. m.—Elmer Nippes's Orchestra.

8.15 p. m.—Sydney Webster, barytone.

8.35 p. m.—F. A. Staiger, talk.

8.50 p. m.—Sydney, Webster, barytone.

9 p. m.—John Stein, violinist.

9.10 p. m.—Ann Jecker, soprano.

9.25 p. m.—John Stein, violinist.

9.45 p. m.—Ann Burr Jecker and Edna Glass, accompanist. WGBS—NEW YORK CITY—316

1:80 p. m.—Scripture Reading.
1:35 p. m.—Mary Milligan, soprano;
Cork's Orchestra.
3 p. m.—Woman's Hour.
3:10 p. m.—Frances Miller, soprano.
3:20 p. m.—Fyegetables and flowers."
3:30 p. m.—Frances Miller, soprano.
3:40 p. m.—Household talk; songs.
6 p. m.—Uncle Geebee.
6:30 p. m.—Berl House Orchestra.
7:30 p. m.—Book and play review.
9 p. m.—Lydia Mason, planiste.
9:30 p. m.—Lydia Mason, planiste.
9:30 p. m.—Warner's Theater program.
WHN—NEW YORK CITY—361

12:30 p. m.—Marsh McCurdy, organist. 10 p. m.-Albrecht's Orchestra.
WFI-PHILADELPHIA-395 1 p. m.—Tea Room Orchestra. 3 p. m.—Talk, "Our Obligation"; songs, 3:45 p. m.—Eleanor Gunn fashion feature

service.

12:30 p. m.—Concert orchestra;

2-3 p. m.—Concert orchestra;

4:30 p. m.—Artist recital.

7:30 p. m.—Dream Daddy.

8 p. m.—Artist recital.

10 p. m.—Dance Orchestra.

10:30 p. m.—Dance music. 1 p. m.—Organ recital.
WOO—PHILADELPHIA—508 m.—Grand organ. n—Luncheon music. 12 noon—Luncheon music,
7:30 p. m.—Dinner music,
8 p. m.—United States Army Band,
9 p. m.—"Old Timers' Hour."
10 p. m.—Ipana Troubadours,
11 p. m.—Dance music.

WRNY-NEW YORK CITY-258

WNYC-NEW YORK CITY-526

10 a. m.—New York State Convention of the American Legion.

2 p. m.—New York State Convention of the American Legion.

6:30 p. m.—"Home Economics."

6:30 p. m.—Madeline Moss, contraito.

7 p. m.—Market high spots.

7:10 p. m.—Arcady Orchestra.

7:30 p. m.—Police alarms.

7:35 p. m.—Acady Orchestra.

8 p. m.—"Baseball," Frederick Lieb.

8:15 p. m.—Kaltenborn's Orchestra.

10:30 p. m.—Police alarms; weather.

WFBH—NEW YORK (HTV-273

WFBH-NEW YORK CITY-279

WOKO-NEW YORK CITY-283

WHAP-BROOKLYN-240

WBBR-STATEN ISLAND-273

8 p, m.—George Goldstein, pianist. 8:15 p. m.—Helen Hamman, contraito. 8:35 p. m.—Martin Walsh, barytone. 8:50 p. m.—George Goldstein, pianist. 9:05 p. m.—Semalina Stevenson, sopra 9:20 p. m.—Sam Burton's Boys.

WIP—PHILADELPHIA—508
7 a. m.—Setting-up exercises.
10:30 a. m.—Setting-up exercises.
3 p. m.—"Song of the Surf."
3:30 p. m.—Philharmonic Orchestra.
6:05 p. m.—Dinner music.
7 p. m.—Bedtime Story.
WPG—ATLANTIC CITY—300
3 p. m.—Beauty pageant parade.
8:30 p. m.—Introduction of inter-city beauties. WRNY—NEW YORK CITY—258

12 (noon)—Luncheon entertainment.

1 p. m—Radio industry hour.

1:10 p. m.—Bill Reitz, Willard Ward.

7 p. m.—Sports results.

7:10 p. m.—Commerce of the day.

7:20 p. m.—Home science.

7:35 p. m.—Studio concert.

8 p. m.—Orlando's Orchestra.

8:30 p. m.—New popular songs.

9 p. m.—New popular songs.

9 p. m.—Debut night.

9:35 p. m.—Popular songs.

9:46 p. m.—Classical Theater.

10 p. m.—Classical Theater.

10 p. m.—Vew York State Convention WGY-SCHENECTADY-380

pram. WGR—BUFFALO, N. Y.—319
p. m.—W. M. Thomas, barytone.
0 p. m.—Two-piano recital.
1 p. m.-1 a. m.—Supper music.
WHAM—ROCHESTER, N. Y.—278 WJAR-PROVIDENCE-306

10 a. m.—Housewives' Radio Exchange 10:45 a. m.—Textile lesson. 1:05 p. m.—Studio program. 2:30 p. m.—Rathskeller Trio. 3:15 p. m.—Address, Hiram Nones. 3:30 p. m.—Rathskeller Trio. 7:30 p. m.—United States Army Band.

WEEL-BOSTON—3 6:45 a. m.—Health exercises. 6:30 p. m.—Big Brother Club. 7:20 p. m.—Lots and found; sc 7:30 p. m.—C. B. Collins, tenor 8 p. m.—Lotus Quartet. 8:30 p. m.—Musical program.

WCTS-WORCESTER

10:80 a. m.—Radio chats; music.

12-2 p. m.—Luncheon music.

7:15 p. m.—Story teller; scores.

WRC-WASHINGTON-469

10 a. m.—Women's Hour from WJZ.

1 p. m.—Organ recital.

2 p. m.—Washington Orchestra.

2:55 p. m.—Washington-Philadelphia l
ball game.

6 p. m.—United States Marine Band.

6:45-7:45 a. m.—Health exercises. WCTS-WORCESTER

6:45-7:45 a. m.—Health exercises, 7:80-0 p. m.—U. S. Army Band. 9:05-9:15 p. m.—To be announce. 0:15 p. m.—Concert and dance pro KDKA—PITTSBURGH—309 7 p. m.—Scores.
p. m.—Hour of music.
WCAE—PITTSBURGH—461

6:30 p. m.—Dinner concert. 7:30 p. m.—The Sunshine Girl. p. m.—Concert. 1 p. m.—Loew's Aldine Theater.

#### THURSDAY

p. m.—News; scores; racing results, p. m.—Market reports,

WJY-NEW YORK CITY-408 7:30 p. m.—Freddie Rich's Orchestra. 8:15 p. m.—"The Horse," Wayne Dins

WGBS-NEW YORK CITY-\$16

WHN-NEW YORK CITY-361
12:30 p. m.—Marsh McCurdy, organist.
3:15 p. m.—Lexington Theater Orchestra.
4:30 p. m.—John Cassidy, barytone.
4:35 p. m.—Lewis Piotti, Bob Miller, songs.
5 p. m.—The Rev. J. N. Daly, readinga.
7:30 p. m.—Geoli Kennedy's Quintet.
8 p. m.—Oakland's Chatheau Shanley.
8:30 p. m.—Ethel West, soprano.
8:35 p. m.—Fitzpatrick Brothers.
9 p. m.—Jimmy Clark's Entertainers.
9 p. m.—Jimmy Clark's Entertainers.
10 p. m.—Kenneth Moitz, tenor.
10:15 p. m.—Vaudeville headliners.

WAHG-RICHMOND HILL, M. X.—3
12:30 p. m.—Joe Zimmerman, pismist.

WOR—NEWARK—405
6:45, 7:15, 7:45 a. m.—Gym class.
2:30 p. m.—Anson Depue, tenor.
2:46 p. m.—Dorothy Hall.
3 p. m.—Jack Glassner's Orchestra.
3:15 p. m.—Anson Depue, tenor.
8:30 p. m.—Jack Glassner's Orchestra.
2:45 p. m.—Albert Henkel, barytone.
6:15 p. m.—Words Often Mispronounce.
6:17 p. m.—Al Lynn's Music Master.
7:15 p. m.—'Sports.' Pat Robinson.

WGGP—NEWARK—262 WEAF-NEW YORK CITY-492 '45-7:45 a. m.—Health exercises.

1-12 (noon)—"Housewives Hour."

2 (noon)—Market and weather reports.

p. m.—Quartet solos.

116 p. m.—N. Curtis, planist. m.—"Sports." Pat Robinso WGCP—NEWARK—252 p. m.—"Garden talk."
m.—Dinner music.
m.—Mid-week services.
p. m.—Serenaders.
p. m.—"Fop" concert.
p. m.—"Touring" George Cooley
m.—Radio artists 9 p. m.—"Touring," George Cooley 9 p. m.—Radio artists. 10 p. m.—Silvertown Orchestra. 11-12 p. m.—Vincent Lopez's Orchestra. 5:45 p. m.—Theo. Alban. WJZ-NEW YORK CITY-454

WAAM-NEWARK-263 WLIT-PHILADELPHIA-395

4:80 p. m.—Artist recital. WIP-PHILADELPHIA-508 7 a. m.—Setting-up exercises.
1:30 p. m.—Weather forecast.
3 p. m.—"Song of the Surf."
3:30 p. m.—Comfort's orchestra.
6:05 p. m.—Dliner music.
7 p. m.—Rell call; birthday list;

solos.

8 p. m.—Comfort's Orchestra; soloists.

8:40 p. m.—'Song of the Surf.''

8:50 p. m.—Veselli's Band; soloists.

10 p. m.—The Gaylord Young Dance or chestra.

11 p. m.—Night Hawks Orchestra. WOO—PHILADELPHIA—508

11 a. m.—Grand organ.

12 (neon).—Luncheon music. 4:45 p. m.—Grand organ and trumpets. 7:30 p. m.—Dinner music.

WCAU—PHILADELPHIA—278
6:30 p. m.—Billy Hayes's orchestra. tra.

8 p. m.—Recital.

9 p. m.—Myra Glass, barytone.

10 p. m.—Eddie Malle, Danny Dougherty, songs.

10 p. m.—Eddie Malle, Danny Dougherty, songs.

WPG—ATLANTIC CITY—300

3 p. m.—Beauty pageant.

6:30 p. m.—Filly" Rocap, "Sports."

6:45 p. m.—Crgan recital.

7 p. m.—Turu Weyant, songs.

8 p. m.—Lulu Weyant, songs.

8 p. m.—Lulu Weyant, songs.

8 p. m.—Myra Glass, barytone.

9 p. m.—Myra Glass, barytone.

9 p. m.—Myra Glass, barytone.

10 p. m.—Erellins' Radio Trio.

10:15 p. m.—Erellins' Radio Trio.

10:30 p. m.—Roseland Dance Orchest II:30 p. m.—Alabam Orchestra.

12 a. m.—Silver Slipper Orchestra.

WMCA—NEW YORK CITY—341

1:00 a. m.—Virginia Le Fevre, contralto.
1:15 a. m.—'Lamps,' Bernice Bowser.
1:35 a. m.—Henry Rogers, pianist.
1:35 a. m.—Virginia Le Fevre, contralto.
1:30 p. m.—Single Bowser.
1:30 p. m.—Single Bowser.
1:30 p. m.—Bernard Mann, pianist.
1:45 p. m.—Musical program.
1:00 p. m.—Bernard Mann, pianist.
1:15 p. m.—Robert Chree, baritone.
1:15 p. m.—Robert Chree, baritone.
1:15 p. m.—Symphony Orchestra.
1:15 p. m.—Organ recital.
1:15 p. m.—Bobert Chree, baritone.
1:16 p. m.—Song recital.
1:180 p. m.—Organ recital.
1:180 p. m.—Bobert Chree, baritone.
1:19 p. m.—Song recital.
1:180 p. m.—Organ recital.

WGY-SCHENECTADY-380

WHAM—ROCHESTER—278
p. m.—Eastman Theater Orchestr
m.—Theater organ
p. m.—Baseball scores; weather. WJAR-PROVIDENCE-306 wJAK-PROVIDENCE 306
a. m.—Textile lesson.
p. m.—Twin Elm Orchestra.
b. m.—Rathskellar Trio.
b. m.—Address, Henry Dexter.
p. m.—Rathskeller Trio.
p. m.—Usher and Bond.
b. m.—Wusical program.
b. m.—"Stolen Automobiles."
n.—Concert.

WTIC-HARTFORD, CONN.-476 / p. m.—Dinner music. 7:80 p. m.—Weather report; scores. 7:55 p. m.—Dinner music.

WEEL-BOSTON-349 WBZ-SPRINGFIELD, MASS.-333

WCTS-WORCESTER, MASS-268

2 p. m.—Orchestra.
3 p. m.—Amy Mateson, soprano.
8.30 p. m.—Radiovues, Mrs. Owen Kildare.
4 p. m.—Baseball scores (\( \frac{1}{2} \) hourly).
4.15 p. m.—William Reitz, Willard Ward 5:15 p. m.—Story teller; scores.
10-11 p. m.—"Silvertown Orchestra."
WRC—WASHINGTON—469
10 a. m.—Women's hour from WJZ.
1 p. m.—Organ recital.
2 p. m.—Washington Orchestra.
8 p. m.—Shoreham Orchestra.
8:30 p. m.—United States Marine Band.
10 p. m.—Royal Hour of Music.
11 p. m.—Meyer Davis Band.
11 p. m.—Meyer Davis Band.
3:30-7 p. m.—Scores.
10 p. m.—Public Policy program.
11:15 p. m.—Concert.

11:15 p. m.—Concert. WCAE—PITTSBURGH—461

songa.

4:80 p. m.—Countess Xenia, soprano.

4:85 p. m. William Boehls, baritona.

5 p. m.—Murray Schwartz, planist.

5:15 p. m.—Maestro Lombardo, tenor.

5:30 p. m.—Betty Wayne, soprano.

5:45 p. m.—Mario Alvarez, tenor.

6 p. m.—Frank Horel, violinist.

6:15 p. m.—Sara Turits, soprano.

6:30 p. m.—Blucher Trio.

7 p. m.—Theodore Alban, Billy Baskette

7:30 p. m.—Bludred Berndt. soprano.

7:45 p. m.—Bob Ward's little Wards. FRIDAY

0 a. m.—Women's program, 1 a. m.—News service, :00 p. m.—Ambassador Trio, , 4, 5:20, 8 and 10:30 p. m. p. m.—Scores, raume hourly). 4:10 p. m.—John B. Daniel, readings. 5:20 p. m.—News, baseball, racing

5:20 p. m.—News, baseball, racing sults.
5:26 p. m.—Market reports.
5:50 p. m.—Financial summary.
7 p. m.—Lafsyette Orchestra.
8 p. m.—Scores, racing results.
8:10 p. m.—Keith McLeod, pianist.
8:30 p. m.—Colgate Trio.
9:30 p. m.—Frances Reade, contralto.
10:30 p. m.—Ben Glaser's Orchestra. WAHG-RICHMOND HILL, N. Y.—316 12:30 p. m.—Joe Zimmerman nighted

WEAF—NEW YORK CITY—492: 45-7:45 a. m.—"Health Exercises." 1-12 a. m.—Musical program: speak 2 noon—Market and weather reports. m.—Gene Ingraham's Orchestra.

7 p. m.—Gene ingranam's Orchesta.
7:30 p. m.—Story,
7:45 p. m.—Veo Lawnhurst, pianist.
8 p. m.—The Happiness Boys.
8:30 p. m.—Neutrodyne Trio.
9 p. m.—"Entertainers."
10 p. m.—Cameron Emslie, pianist.
11 p. m.—Jack Albin's Orchestra.

11 p. m.—Jack Albin's Orchestra.

WGBS—NEW YORK CITY—316

1:30 p. m.—Scripture reading.

1:35 p. m.—Margie Le Valle, Peter L
valle, songs.

3 p. m.—Interview with Claude Cooper.

3:10 p. m.—Hefen Dowdy, soprano.

3:20 p. m.—Dancing lessons.

3:30 p. m.—Helen Dowdy, soprano.

3:40 p. m.—Helen Dowdy, soprano.

3:50 p. m.—Helen Dowdy, soprano.

6 n. m.—Uncle Geabee. p. m.—Helen m.—Uncle Geel

WHN-NEW YORK CITY-361
2:15 p. m.—Alice Lockwood, readings.
2:25 p. m.—Francis Capouilliez, barytone.
2:45 p. m.—Frank Galasi, planist.
5 p. m.—Trank Boys."
3:45 p. m.—Richard Hitter's Cabineers.
4:16 p. m.—Richard Hitter's Cabineers.
4:18 p. m.—Holce Robert's Chat.
4:45 p. m.—Al. Wilson, songs.
5 p. m.—Helen Butts, soprano.
6:45 p. m.—Lulu Weyant, songs.
7 p. m.—Eva C. Hodgkins, soprano.
7:20 p. m.—Joe Sherman, songs.
7:30 p. m.—Burr McIntosh, philosopher.
8 p. m.—Lulu Weyant, songs. WHN-NEW YORK CITY-361

m.-Lulu Weyant, songs.

WPG-ATLANTIC CITY-306

3 p. m.—Beauty pageant.
6:30 p. m.—City Flilly Rocap, "Sporta."
6:45 p. m.—Organ recital.
7 p. m.—'Kentucky Serenaders."
8:30 p. m.—Beauty Pageant Most beautiful girl in evening clothes. Awarding of prizes.
11 p. m.—Dance orchestra.
WGR-BUFFALO, N. Y.—319
6:20-7:30 p. m.—Dinner music.
6-11 p. m.—Program same as WEAF.
7:35 p. m.—Market High Spots.
7:36 p. m.—Advanced French lessons.
7:10 p. m.—Advanced French lessons.
7:10 p. m.—Advanced French lessons.
7:20 p. m.—Advanced French lessons.
7:25 p. m.—Market High Spots.
7:26 p. m.—Baseball results.
8:05 p. m.—Baseball results.
8:05 p. m.—Herman Neuman, planist.
8:15 p. m.—Monarch Band.
10:16 p. m.—Rudolph Joskowitz, viol.

10:15 p. m.—Rudolph Joskowitz, violinist. 10:30 p. m.—Police alarms; weather. 10:35 p. m.—Rudolph Joskowitz, violinist. 10:25 p. m.—Rudolph Joskowitz, violinis WRNY—NEW YORK CITY—258

12:02 p. m.—Trio concert.
1 p. m.—Radio industry hour,
1:02 p. m.—Sports forecast.
1:10 p. m.—Sports results.
7:10 p. m.—Commerce of the Day.
7:20 p. m.—Code lesson.
7:50 p. m.—Harry Bernord, songs.
8 p. m.—Grand opera, "Avitable."
8:45 p. m.—Band concert.
9 p. m.—Tsadio in Retrospect," Sylv. Harris.

WMCA-NEW YORK CITY-341

WMCA—NEW YORK CTTY—341

1 a. m.—Snedden Weir, barytone; Helen Herman, contralto.

1:45 a. m.—Talk, "We Women."

:30 p. m.—Ernie Golden's Orchestra.
p. m.—Ernie Golden's Orchestra.

:30 p. m.—Helen Morris, soprano.

:45 p. m.—Helen Morris, soprano.

;p. m.—"Helps for Better Reception."

:10 p. m.—Manhattan Serenaders.

:10 p. m.—Barnian Hour of Musio.

10 p. m.—Hardman Hour of Musio.

10 p. m.—"How to Drive."

10:03 p. m.—Dance orchestra.

11 p. m.—To be announced.

11:15 p. m.—Donald Flamm, critic.

12 p. m.—1 a. m.—Dance orchestra.

WEBJ NEW YORK CITY 273

p. m.—Walter Seibert's Serenaders

7:30 p. m.—Czecho-Slovakian Band.

8 p. m.—De Keller Stamey, recitations.

8:15 j m.—Sara V. Turits, soprano.

8:30 p. m.—Pryor's Concert Band.

WFBH—NEW YORK CITY—278

2 p. m.—Eddle Meyer's Orchestra.
3 p. m.—Mercedes Mauser's Trio.
3:45 p. m.—Flame Moore, songs.
4 p. m.—Baseball scores (every 15 min.)
4 p. m.—Studio program.
4:45 p. m.—Eddie Meredith, Nat Osborne,
9 p. m.—Herman Popper's Trio.
9 p. m.—Roger Knox, tenor.
9 p. m.—Roger Knox, tenor.
9 p. m.—Herman Popper's Trio.
10:30 p. m.—Joseph Knecht's Orchest

HARLE THE MARKET CHARLES THE

:15 p. m.—Irwin Abrams' Orchestra, 4, 5:20, 8 and 10:25 p. m.—News. 6 p. m.—Scores, racing results (half-

4-6 p. m.—Scores, racing results (ham hourly).
5:20 p. m.—News, scores, racing results.
5:26 p. m.—Market reports
5:50 p. m.—Financial summary.
6:01 p. m.—Fanacial summary.
6:01 p. m.—Baseball, racing returns.
7 p. m.—Nathan Abas's Orchestra.
8 p. m.—Scores, racing results.
8:30 p. m.—Herman Pennes's Trie

10:30 p. m .- Joseph Knecht's Orchestra.

m.—Cliff Murray, pianist p. m.—Police alarms. p. m.—Trio Sono.

WNYC-NEW YORK CITY-526

WEAF-NEW YORK CITY-492

m .--- Albert Miller tenor. p. m.—Raul Paniagua, pianist, p. m.—Pasadena Warblers, p. m.—Raul Paniagua, pianist,

0:10 p. m.—Sadrian Tric.
10:30 p. m.—Sadrian Tric.
10:45 p. m.—Ethel and Dorothea

singers. 1-12 p. m.—Vincent Lopez's Orchestra.

WGBS—NEW YORK CITY—316

1:30 p. m.—Scripture reading.

1:35 p. m.—Leonard Garfunkle, pianist.

1:40 p. m.—Bell Harbor Serenaders.

3:10 p. m.—Bob Platz, pianist.

3:20 p. m.—Bob Platz, pianist.

3:40 p. m.—Leosons to motorists; pianis

6 p. m.—Uncle Geebee.

6 p. m.—Uncle Geebeer.

7 p. m.—L. Kenneth Williams. 7:10 p. m.—Comus Orchestra. 7:30 p. m.—Alma Newman, Louis Johnes.

WRNY-NEW YORK CITY-258

WOKO-NEW YORK CITY-233

:40 p. m.—Ralph Hersh, violinist.

7:40 p. m.—Ralph Hersh, violinist.
7:50 p. m.—Alma Newman, liedersinges.
8 p. m.—Andalusian half hour.
8:30 p. m.—Gaelic Hour of Minstrelsy,
9:30 p. m.—Forstat String Quartet.
9:40 p. m.—Joseph Livoisi, violinist,
9:50 p. m.—Forstat String Quartet.
10 p. m.—Jacob Forstat, cello.
10:10 p. m.—Forstat String Quartet,
10:30 p. m.—Meyer Davis's Orchestra,
11 p. m.—Arrowhead Orchestra.

6 p. m.—Uncle Geebee.
6:80 p. m.—Comus Orchestra.
7 p. m.—L. Kenneth Williams.

6 p. m.—Billy Johnson's Orchestra.

WOKO—NEW YORK CITY—233
8:30-11 p. m.—Bike races; Joe Bas.
Band. WHAP-BROOKLYN-240 3:30 p. m

8:30 p. m.—Recital.

WAHG-RICHMOND HILL, N. Y.—316
12:30 p. m.—Musical program.
7:30 p. m.—Thornton Fisher, sport talk.
7:45 p. m.—George Wooley, saxophone.
8 p. m.—Davison Sisters, songs.
8:15 p. m.—Emery Deutsch, violinist,
8:30 p. m.—Charles Relyes, barytone.
8:45 p. m.—Artist' program.
10 p. m.—Radio Question Box.
10:15 p. m.—Frank Lauria's Orchestra.
11:05 p. m.—Frank Lauria's Orchestra.
11:05 p. m.—Frank Lauria's Orchestra.
2:30 p. m.—Talk, Professor J. P. Santamarina.

2:30 p. m.—Talk, Professor J. F. Sante-marina,
2:46 p. m.—Dick and Flo Bernard, songs.
3 p. m.—"Byron," B. P. Adams.
3:15 p. m.—Dick and Flo Bernard, songs.
3:30 p. m.—Guy Hunter, entertainer.
6:15 p. m.—Words Often Mispronounced."
6:17 p. m.—"Sports." Pat Robinson.
6:30 p. m.—"Man in the Moon" stories.
7 p. m.—Howard Oliver's Orchestra.
WGGP—NEWARK—252

WGCP—NEWARK—252

3 p. m-6 p. m. — Vocal and instrumental solos; race results,
8 p. m.—Steele and Heagney,
8:15 p. m.—Lillian Gordone, contraito.
8:30 p. m.—Hoch and Jerome, songs.
8:45 p. m.—William J. Rietz, songs.
9 p. m.—Coakley Sisters, singers.
9:15 p. m.—Sarah Summers, whistler,
9:30 p. m.—Jack Smith personality.

10:30 p. m.—Polla's Orchestra.

WAAM—NEWARK—263

11 a. m.—Happy hour program; lesson. — Marinello Girl.

11:30 a. m. — Happy hour.

7 p. m. — Ray Nichols's Orchestra.

7:30 p. m. — The Sport Oracle.

7:45 p. m. — Ray Nichols's Orchestra.

8:16 p. m. — Hilda Kay, contraito.

8:30 p. m. — Bloomfield Ridge Boys.

9 p. m. — Hilda Kay, contraito.

9:15 p. m. — Entertainers.

9:20 p. m. — Transcontinental tour.

gram.

12:30 p. m.— Trio concert.

1 p. m.—Radio Industry Hour.

1:20 p. m.—Studio features.

7 p. m.—Sports results. m.—Transcontinental tour. WFI—PHILADELPHIA—395 WRI—FHILADELE III.

1 p. m.—Tea Room Orchestra.

3 p. m.—John Owens, tenor.

3 15 p. m.—Eleanor Gunn Fashion Fes.

645 p. m.—Roof Garden broadcast.

WILT—PHILADELPHIA—895 7 p. m.—Sports results.

7:10 p. m.—Commerce of the day.

7:20 p. m.—Fairy tales.

7:40 p. m.—Fairy tales.

8: p. m.—Orlando's Concert Orchastr

8:15 p. m.—Motion picture series.

8:30 p. m.—Musical Period.

9 p. m.—"Cleaning Agents."

9:15 p. m.—Violin period.

10:15 p. m.—Violin document.

12 mid—DX Hound Hour. 12:05 p. m.—Organ recital;

12:05 p. m.—Organ recital; Concert chestra.

-2.8 p. m.—Concert Orchestra; playlet.

4:30 p. m.—Dance music.

7:30 p. m.—Dream Daddy.

8 p. m.—Artist recital.

8:15 p. m.—Concert Orchestra.

8:30 p. m.—'Welch's Minstrels."

10 p. m.—Dance Orchestra.

10:30 p. m.—Popular program.

11 p. m.—Dance music.

WCAU—PHILADELPHIA—278

8 p. m.—Symphony String Quartet WUAU—FILL p. m.—Symphony String Quartet. p. m.—The Playmateg :30 p. m.—Rennie Cormack, songa

MMCA—NEW YORK CITY—241

8 p. m.—Gladys Matthew, soprano.

8:15 p. m.—Carl Tannert, cello; Frederick
Seifert, barytone.

8:46 p. m.—Gladys Matthew, soprano.

9 p. m.—Asbury Park Dance Orchestra.

10 p. m.—Helen Morris, soprano.

10:30 p. m.—Joseph Wetzel, tenor.

10:45 p. m.—Joseph Wetzel, tenor.

10:45 p. m.—Joseph Wetzel, tenor.

11 p. m.—Ernie Golden's Orchestra.

12-1 a. m.—Dance orchestra. p. m.—Jack Myer's dance music WOO—PHILADELPHIA—508 12 noon—Luncheon music.
4:45 p. m.—Grand organ and trumpets.
7:30 p. m.—Dinner music.
8 p. m.—J. W. C. I. Military Band.
8:45 p. m.—Musical program by artists,
10 p. m.—Organ recital.
10:30 p. m.—Dance music.
WIP—PHILADELPHIA—508

5 p. m.—Beatrice Ellman, soprane, 5 p. m.—Sarah Sommers, whistler, 6 p. m.—Florence Roude; entertainer, 5 p. m.—Vlodimir Tobachnik, baryton WHAF—BROOKLYN—240 WBBR—STATEN ISLAND—273

B. p. m.—Dr. Hans Haag, violinist,

1:10 p. m.—Fred Twaroschk, tenor.

8:20 p. m.—Bible questions and answers.

8:40 p. m.—Tenor, violin solos. WPG—ATLANTIC CITY—300 1:30 p. m.—Traymore lunch 3 p. m.—Beauty pageant. 6:45 p. m.—Organ recital. 7 p. m.—Dinner music. WHAG-RICHMOND HILL, N. Y. SM

SATURDAY

WFBH—NEW YORK CITY—273 m.—Sunny Brook Orchestra, m.—Entertainers.

m.—Baseball (quarter hourly).
m.—Baseball (quarter hourly).
m.—William Sullivan, barytone,
p. m.—Montana Ramblers,
p. m.—Marion Doran, soprano,
p. m.—Asterio Fernandez, tenor
p. m.—Knickerbocker Hospital;
m.—Francis Collins, tenor,
n. m.—Connelles Orghester

m.—Dinner music.
p. m.—"Kentucky Serenaders."
p. m.—Atlantic City beauty pages WOR—NEWARK—405 6:45-7:15-7:45 a. m.—Gym class. 2:30 p. m.—Al Wilson's Playmates, 3 p. m.—Mario Alvarez, barytone. WGY—SCHENECTADY—380

2 p. m.—Music; talk.
6:30 p. m.—Sunday school lesson.
7 p. m.—Strand Theater Orchestra.
7:30 p. m.—Scores; health talk.
7:40 p. m.—Comedy, "Ming Toy's Romance." 10:30 p. m.—Program by artists.
WGR—BUFFALO, N. Y.—319

3 p. m.—Mario Alvarez, barytone,
\$:15 p. m.—Fay Carpenter, soprane,
\$:30 p. m.—Mario Alvarez, barytone,
3:45 p. m.—Fay Carpenter, soprane,
6:15 p. m.—Wonds Often Mispronounced.\*
6:17 p. m.—Wonds Often Mispronounced.\*
7:15 p. m.—Wonds Often Mispronounced.\*
7:16 p. m.—Herman Rice's Orchestra,
7:30 p. m.—Central Park Orchestra.
8 p. m.—Robert Ballin, Oscar Race, due,
8:15 p. m.—Talk, Dr. George Gilmore,
8:30 p. m.—Robert Ballin, Oscar Rice, due,
8:45 p. m.—Archie Slater's Orchestra.
9:30 p. m.—Florence Ballou, planista,
9:45 p. m.—Grace Divine, soprane, p. m.—Wingers's Entertaine to 10 p. m.—Popular music, 1 p. m. to 1 a. m.—Supper 11 p. m. to 1 a. m.—Supper music.

WHAM—ROCHESTER—278

30 p. m.—Theater orchestra.

p. m.—Eastman Theater organ.

p. m.—Theater organ. WGCP—NEWARK—252

-6 p. m.—Vocal and instrumental race results WAAM-NEWARK-263

WAM—NEWARK—263
7 p. m.—Entertainers.
7:30 p. m.—Jolly Bill Steinke.
7:50 p. m.—Alce Lauri, soprano.
8:10 p. m.—Schwab Serenaders.
9:10 p. m.—Erv Bradley, Clint Blackwell, planists.
9:25 p. m.—Grace Racaneille, soprano.
9:50 p. m.—Erv Bradley, Clint Blackwell.
10:10 p. m.—Hartley Joy Boys.
WFI—PHILADELPHIA—395
1 p. m.—Tea Room Orchestra.
3 p. m.—Dance music.
3:45 p. m.—Eleanor Gunn fashion feature.
6:45 p. m.—Roof Garden broadcast.
8 p. m.—Mildred Kemmever, soprano.
8:10 p. m.—Talk, "Poets and Poetry."
8:30 p. m.—Vocal and Instrumental recital.
WOO—PHILADELPHIA—508
4:45 p. m.—Grand organ; trumpets. wtic-Hartford, Conn.-476 WTIC-HARTFORD, CONN.—476

7 p.m.—Travelers Jongleurs.
1:30 p.m.—Weather report; scores.
3 p.m.—Travelers Jongleurs.
3:35 p.m.—C. Harold Smith, planist.
3:30 p.m.—Dance music.
WEEL-BOSTON—349

WEEI-BOSTON-349
6:45 a. m.—Health exercises,
5:30 p. m.—Frankie Ward's Orchestra.
6:30 p. m.—Big Brother Club.
7:20 p. m.—Lost and found; scores,
7:30 p. m.—Musical,
3 p. m.—Neapolitan program.
9 p. m.—Ed Andrews's Orchestra.
18 p. m.—Griddel's Colonial Orchestra. 4:45 p. m.—Grand organ; trumpets. 7:30 p. m.—Dinner music. WIP—PHILADELPHIA—508 p. m.—Grindell's Colonial Orchestra.
WBZ—SPRINGFIELD, MASS.—333 WBZ—SPRINGFIELD, MASS.—333
7 p. m.—Dinner concert.
9 p. m.—Bordian Trio.
9:30 p. m.—Copley Plaza Orchestra.
10 p. m.—Exposition Orchestra.
10:30 p. m.—Market report; scores.
WCTS—WORDESTER, MASS.—268
10:30 a. m.—Radio chat; music.
12 to 2 p. m.—Luncheon music.
7:15 p. m.—Story teller; scores.
WRC—WASHINGTON—469
10 a. m.—Women's hour from WIZ. WIP—PHILADELPHIIA—508
7 a. m.—Setting-up exercises.
10:30 a. m.—Setting-up exercises.
3 p. m.—"Song of the Surf."
3:30 p. m.—Comfort's Orchestra.
6:05 p. m.—Dinner music.
7 p. m.—Bedltime story.
8 p. m —Comfort's Orchestra.
8:45 p. m —"Song of the Surf."
8:50 p. m.—Vesell's Band.
10:05 p. m.—California Night Hawks
chestra. 10 a. m.—Women's hour from WJZ.
1 p. m.—Women's hour from WJZ.
1 p. m.—Organ recital.
2 p. m.—New Willard Orchestra.
WCAP—WASHINGTON—469
6:45 to 7:45 a. m.—Health exercises.
9 p. m.—Organ recital.
10 p. m.—To be announced.
10:15 p. m.—Wardman Park Trie.
11:15 p. m.—Dance program.
KDKA—PITTSEURGH—309
LIL 3:30 p. m.—Scores.

chestra.
WPG—ATLANTIC CITY—300 WFG—ATLANTAN

6 45 p. m.—Organ recital.

7 p. m.—Traymore dinner music.

8:05 p. m.—Beauty pageant description

11 p. m.—Dance orchestra.

WGY—SCHENECTADY—\$80 WGY—SCHENEGAM

10:30 p. m.—Dance program.

WGR—BUFFALO, N. Y.—319

8:45-10:16 p. m.—United States M

Band.

WHAM—ROCHESTER—278

—Eastman Theater Orchest

WHAM—ROCHESTER—278
4:30 p. m.—Eastman Theater Orches
6 p. m.—Theater organ.
8 p. m.—Theater organ.
8:30 p. m.—Scores; weather.
WJAR—PROVIDENCE—306

WJAR—PROVIDENCE—306

10:45 p. m.—Studio program.

1:30 p. m.—Studio program.

2:30 p. m.—Rathskeller Trio.

WCTS—WORCESTER, MASS.—268

10:30 a. m.—Miscellaneous program.

12 m.—2 p. m.—Luncheon music.

5:16 p. m.—Story teller; scores.

5:30 p. m.—Baseball scores.

WRC—WASHINGTON—469

8 p. m.—Washington Orchestra. p. m.—Washington Orchestra. 15 p. m.—Musical program. 1:80 p. m.—Crandall's Saturday Nighton KOKA—PITTSBURGH—309 3:30-7 p. m.—Scores.
9:45 p. m.—Westinghouse Band.
WCAE—PITTSBURGH—461 8:80 p. m. John B. Thuring, barytone

# Dance Orchestras for This Week

TO-DAY Time Wave P. M. Station Length. Ochestra WHN 861 Roseland MONDAY, SEPTEMBER 7

\$ :00

WEEI 349
WGR 319
WBZ 333
WAHG 816
WGCP 252
WPG 300
WEAF 492
WRNY 259
WOO 508
WHAZ 880
WHAZ 880
WPG 300
WGR 819
WAHG 816 Ed Andrews's Dance music Copley Plaza Bensonians Bensonians
Polla's
Ky, Serenaders
Bessert Marine
Ben Bernie's
Dance music
Collegians
Dance music
Dance music
Dance music
Vincent Lopes's
Bensonians

TUESDAY, SEPTEMBER 2 7:85 WNYC 526 Canadians 8:00 WAAM 263 Paragon

WMCA 841 WMCA 841 WHN 861 WTIC 476 WBZ 336 WHN 861 WIP 508 WJZ 455 WEAF 492 WMCA 341 WHP 508 WHN 861 Columbia
Asbury Park
Palisades
Dance music
Brunswick
Meyer Davis's
Roseland Roseland
Dance music
Mayflower
Vincent Loper's
Ernie Golden's
Dance music WEDNESDAY, SEPTEMBER \$ WNYC
WHN
WEBJ
WEBJ
WHN
WAHG
WCAP
WLIT
WJZ
WOR
WEAF Glenn Smith's
Dance music
Dance music
Meyer Davis's
Central Park
Bossert Marine
Dance music

11:00 WHN 11:05 WJZ 11-1 WGR Dance music Glenn Smith's Vincent Lopez's THURSDAY, SEPTEMBER 10 Shoreham Palisades Dance music
Ben Bernie's
Cal, Night Hawks
Ernie Golden's
Vincent Lopez's
Jacques Green's FRIDAY, SEPTEMBEE 11 Dance music Ed Andrews's Dance music Monte Carlo Dance music Frank Lauria's Ben Glaser's Roseland Polla's

861 455 819

SATURDAY, SEPTEMBER 12 WFBH 273
WRC 469
WOR 405
WMCA 841
WIP 508
WRNY 258
WGBS 310
WJZ 458
WGY 880
WMCA 841
WEAF 492
WPG 300
WRC 469
WHAG 316
WMCA \$41 Cal. Night Haw Dance music Meyer Davis's J.Knecht's Dance music Ernie Golden's Vincent Lopez's Dance music Crandall's Dance music Dance music

WOO WGR WEAF WRNY WLIT WAHG WCAP WHN Dance music Vincent Loper's Jack Albin's Dance music Dance music Frank Lauria's Dance music Southern Washington Archie Slater's Asbury Park Cal. Night Hawks

### Use of C Battery **Doubles Average**

garded in wiring up radio receivers. portant advantages of using a C bat- of the press, dated May 19, Herbert Whenever this is done one of the tery. Without the C battery the tubes Hoover, Secretary of Commerce, exmost important parts of the entire harsh quality in the loud speaker; ciated, but the fact is that the C bat- loud speaker volume of pure quality tery pays a greater dividend in money may be obtained.-R. A. saved and satisfaction given than any other accessory or part of the receiving system. It increases the operating life of the B battery, it increases higher plate voltages, it increases the short recital given in its studio beload-carrying capacity of the tubes, everloading, and it improves the basso. Mr. Little, who will be ac- stations. nishing any appreciable current, so that all are practically obtained with-

proper adjustment of the C battery voltage, the useful life of the B battery is practically doubled. Even with this increased life of the latter, a little C battery will outlive several sets of B batteries. But suppose that it will outlive only two sets of them. Then during the life of the C battery the C battery in the receiver.

The greater amplification per tube nally successful.

Life of B Batteries without introducing noticeable distor-tion. This latter gain results in Lighthouse Keepers mit me to express my gratitude for mental music and the spoken word.

In the third episode the usual greatly improved quality of the out-The C battery is very often disre- put, and this is one of the most im-

#### Earl Little, Bass Soloist Of Trinity, in Short Recital

the greatest gain derived through the Bishop William T. Manning was formerly rector. In his second recital

two sets of B batteries will have been with Ruth Kemper as director, will pany of anything I have ever seen in saved. The cost of these saved B be heard in a radio concert for the the Lighthouse Service. batteries might have been \$12, whereas first time through WEAF to-morrow the cost of the C battery which evening, beginning at 8 o'clock. This the keepers are making use of the effected this saving might have been orchestra represents a pioneer effort sets in receiving important messages only 75 cents, a saving of \$11.25. in the establishment of a symphony and in the reception of weather re-Hence from this point of view alone orchestra composed exclusively of ports and time signals. When they it is decidedly worth while to include women players. It is now completing become proficient in reading code, its first season and the results of its | many of the sets may be of vital use But this is not the only advantage. work are considered to be phenome- in receiving urgent code messages.

In a letter addressed to members Mr. Hoover's letter reads as fol- through WEAF, WEEI, WFI, WCAE,

friendly and helpful interest in WSAI. ceivers (head sets)-enough to take Memorial Day to be observed a few before more people in America than fore the microphone by Earl C. Little, care of all the remove and isolated days later. It will be built upon an John Drew and he was long regarded

proved their conditions.

Lacerato Spirito" by Verdi, "Tommy to distribute thus far are working battle line to each other. Lad" by Margetson and "Drink to Me very satisfactorily. The keepers re- The second episode will be what is actor's voice. Only With Thine Eyes," the old Eng- port that they are getting clearly and distinctly the words of prominent speakers, musical entertainment, Women's Symphony Orches- good Sunday sermons and the like. tra to Broadcast for First Time One keeper in expressing appreciation Beatrice Oliver's Little Symphony, described his radio as 'the most com-

will make the set more sensitive and will bring in more stations, and the Hoover Thanks All press and the generosity of the publishment famous tragedy "The Erl King." This increase in the load-carrying capacity who Gave Sets to ic. I hope that those who have been drama and tragedy will be brought of the tubes will give more volume who will give more volume through vocal and instru-

Memorial Day Program in will overload quickly and result in pressed appreciation to those who gram" will be broadcast by the receiver is omitted. Its true worth in with a correctly adjusted C battery aided in securing radio receiving ap- Eveready group during the Evethe circuit is not generally appre- and a sufficiently high plate voltage paratus for the Lighthouse Service. ready Hour on Tuesday evening

Shakespeare"s "Henry IV" WGR, WWJ, WOC, KSD, WJAR, tunity of hearing John Drew, the "So many people have taken such a WCCO, WTAG, WGN, WTAM and famous actor, who will speak before securing radio sets for the Light- This hour's program will be made "Shakespeare's 'Henry IV.'" Mr. house Service that it is a distinct up of the presentation of three or Drew will speak under the auspices On Tuesday evening at 7 o'clock pleasure for me to report that we possibly four complete episodes which of the Players Club of New York circuit, it makes possible the use of WEAF's audience will again hear a have received to date about 381 re- will be varied in their character. The City. Probably there is no actor who ceiving sets and 100 telephone re- first episode will be in recognition of is better known or who has played

Eveready group will be augmented by

the popular radio entertainers, the

John Drew to Speak on

episode such as T. R. Thompson's as America's favorite actor. Last fall quality of the output of the receiver. companied by George B. Mead jr., is "Mr. Putnam, Commissioner of little sketch concerning the dark days Mr. Drew made his initial appearance Lighthouses, states that the men in of the Civil War and presenting the in WEAF's studio and broadcast some the service who have received sets musical picture of the outposts of of the scenes of his own famous plays Trinity Church in New York City, sincerely appreciate the kindness of the Union and Confederate armies under the auspices of the committee which stands at the head of Wall the press in prevailing upon some of late at night. The Eveready group on Near East Relief. Only a few Street, the financial center of our generous citizens to make the will give a touch of realism to this weeks ago he appeared as the guest America. This church is one of the donations which have so greatly im- striking episode by rendering the artist of the Eveready Hour program well known songs of both sides of the broadcast through WEAF and a chain "Letters coming in from the light- great conflict. During the Civil War of stations, and those who commented house keepers indicate that the sets period, although brother fought upon his previous radio programs from WEAF Mr. Little will sing "Il which the department has been able brother, their songs floated across the will undoubtedly welcome this new

#### -NOTICE-

The Stromberg-Carlson advertisement which was scheduled to appear on this page will be found on the Radio Broadcast page of the News Section of to-day's Herald Tribune.

# Radio Mail Order and Parcel Post

Any of the articles advertised on this page can be ordered by mail, receiving the same attention as a personally selected purchase. Cut out the advertisement of the article desired, write your name and address plainly, attach money order or check and mail to-day.



#### Vitalitone Cone Loud Speaker 19-Inch Full Floating Diaphragm

Wall Model, 7.50; with Base, 10.00

15 days' free trial, money back if you return it. We take all risk to please you-we know how good it is. Try it

None Better at Any Price

ACCUSTICONE LABORATORIES





THE THOMPSON CONCERT GRAND

Model S-70, Six-tube Neutrodyne, \$47.50
List Price, \$180.00
We have a lew more Sonora Wares, the 3tube Neutrodyne, Type AA-2, at \$11.95
And a few more Music Master Wares, the
4-tube Type 50, at \$12.50,
\$20 WEST 42D ST. PENN 9313

UNLIMITED QUANTITY Brightson **UBES** 



79c Every Tube in Original Box and Guaranteed Perfect. Mail Orders Filled for 6 or More

City Radio Co. 79 Cortlandt St.

110 West 42d St.



Chompson TUBE NEUTRODYNE RADIO RECEIVER \$125.00 SET \$29.25

FOR ONLY
This is the lowest price a genuine Neutrodyne has ever been offered

T. R. F. RECEIVER \$8.98

TUBE

**BABY GRAND** 

UNUSUALLY LOUD AND SELECTIVE

# Order by MAIL

The merchants advertising on this page are equipped to fill your orders by mail. They offer a simple way of doing your Summer Radio Shopping.

### **ENTER CITY RADIO** DIAMOND of the AIR Bruno Basic Kit, listed \$20, \$12.50 our special..... Streamline S. L. F. Cond., \$1.95 BRUNO SERVICE STATION

DYNAMIC RADIO 178 Greenwich St. NEW YORK BLUE TUBES Tested for Oscillation Money Back Guar. 6 Volt Standard 3 Volt 199 3 Volt 199 Standard Base 6 Volt 200

ALL \$ 1 Why Pay ?
TYPES More NETSON RADIO CO. 78 Cortlandt St., N. Y. C.

| I R E |
| I N D E R |
| Will wind all kinds of colls, \$7.50 |
| REMLER KIT | 1-620 |
| 3-600 | \$21.95

WORKSMAN RADIO **SERVICE** 14-16 Vesey St., N. Y. City
CONSOLE CABINETS
Highly Polished to Fit Every
Radio Set. \$18.50 and up.

# THE NEW YORK HERALD New York HERALD Orksig Tribune

PART TEN

SUNDAY, MAY 23, 1926

# This Compact Six-Tube Set Uses Resistance Coupled R. F. and A. F. Amplification

Selectivity, Sensitivity and Clarity Result From Use of Crystal Detector and Regeneration

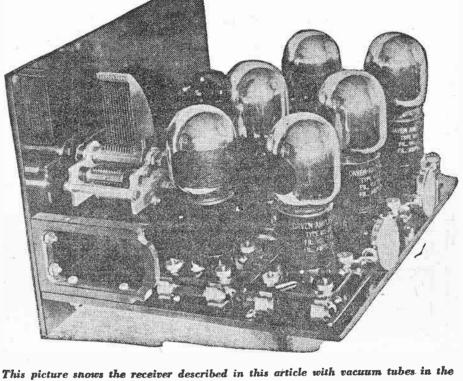
By JAMES B. SCULLY

T IS not generally known among broadcast receiver experimenters that fixed resistances can be employed just as effectively in radio frequency amplifying circuits as they are so commonly employed nowadays in audio amplifier circuits. Their ability in this direction is no particular secret to engineers and more advanced experimenters, for every engineering textbook describes and illustrates the two types of arrangements, but little use has been made of it so far for broadcast reception.

About five years ago Paul Godley, a well known radio engineer, made up a super-hetrodyne, using resistances instead of transformers in the intermediate stages, took the outfit to Scotland for the first amateur trans-Atlantic tests and set a world's record for long-distance amateur reception. This feat was accomplished just before the advent of the broadcast boom, and in the period of frenzied setbuilding activity that followed hardly a word was spoken for resistance R. F. In reading over the technical data available on the subject one is lead to in quire about this neglect, for there certainly is no reason why resistance can not be applied to present-day broadcast receivers. It seems that the pseudo-engineers whose habit it was to dig out old circuits and to present them under new names missed a good bet in this direction.

#### Resistance Coupled R. F.

A radio frequency circuit employing resistances and fixed condensers as the coupling units between successive stages looks exactly like the familiar resistance hook-up for audio amplification. The resistors themselves are the very same, only the coupling condensers being smaller in size. Whereas the condensers in A. F. magnifiers vary between .006 mfd and 1 mfd., those in the R. F. sets are about .0005 or .001 mfd.



tance and capacity for the antenna circuit and the associated grid circuit of the first tube. The rest of the amplifier takes care of itself. The construction of a complete receiver resolves itself into nothing more than the arrangement of the resistors and the placement of a single coil and condenser on the control panel. Resistance operated radio frequency

circuits possess practically the same characteristics as resistance A. F. They function perfectly without regard for the fre-Since the interstage resistors require upon to handle and provide an amplificano adjustment the problem of tuning is | tion per stage equal to the amplification | The set was designed specifically for high | tion, the condenser in the right, the quite simple. If a number of stages are | constant of the tube itself. This last | quality reception of local stations, but in used it is only necessary to provide a property, of course, places the resistance actual service has brought in many distuning combination consisting of induc- amplifier admittedly below the level of tant ones. Its outstanding features are

a tuned and highly regenerative R. F. amplifier on the point of forward amplification, but the deficiency can be compensated for in great part by the introduction of regeneration in a vital point

A very fine little outfit depending on resistances for both its R. F. and A. F. amplifiers was made recently by Sylvan Harris, technical editor of "Radio News." stages of radio frequency and three stages quency of the currents they are called of audio frequency, all with resistances, the detector being a carborundum one.

its simple two-dial control (really two dials, not two dials with a handful of continuously variable micrometer knobs) and its remarkable tone quality.

#### Quality Obtained

Of course, we hear a great deal about that elusive thing called "quality," so much, in fact, that people are inclined to take all the enthusiastic blurbs of individuals and manufacturers with considerable more than the proverbial grain of salt, but this is an amplifier whose capabilities are beyond question. There is a crystal detector feeding a three-stage straight resistance amplifier, the crystal input itself coming from a resistance circuit. If there is any better combination it has not yet seen the light of public

The accompanying illustrations show the receiver plainly. The entire affair is only 10 inches long, 7 high and 8 deep and is a model of compactness. The close mechanical association of the R. F. tubes and appurtenances is of comparatively little importance, because there is only one inductance in the whole set, and it has nothing to feed back into. The resistors themselves have no magnetic effect worth speaking about.

#### The Parts Required Are:

Front panel, bakelite or hard rubber, 10x7x¾ in. Subpanel, 10x8x¾ in. Six Benjamin shock proof push-type sockets, for standard tubes.

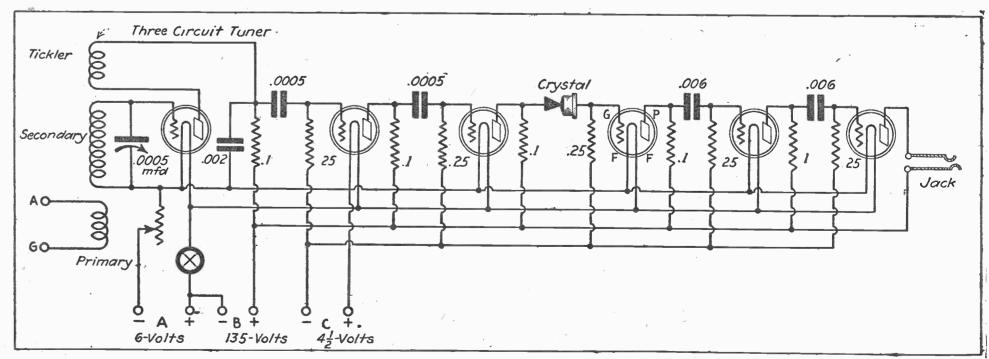
Bruno No. 99 three circuit tuner.

Amsco. 0005 mfd. S. L. F. condenser.

Amsco .0005 mfd. S. L. F. cond Two Marco dials.
One six ohm Bruno rheostat.
Two Garfield shelf brackets.
Cutler-Hammer battery switch.
Single circuit phone jack.
Ten resistor clip mountings.
Carborundum crystal detecter.
Five .1 megohm and five .25 rixed resistors.

The arrangement of the various parts is obvious. On the front panel are mounted the three-circuit tuner, variable condenser, rheostat, battery swith and telephone jack, the coil in the left-hand sec-

(Continued on page five)



The wiring diagram of a six-tube receiver employing three stages of resistance-roupled, radio-frequency amplification, a crystal detector and three stages of resistance coupled audio-frequency amplification

Additional Radio News Will Be Found in Another Section of To-day's Herald Tribune

# An A. C. Plate Supply Unit Designed for Use With a Full-Wave Thermionic Rectifier

The U X 213 Used Provides 140 Volts With Enough Current for the Average Set

By ELMER M. WAKEFIELD

ADIO liseners who can look back five years on the history of broadcasting will remember when it was every fan's ideal and dream that the time would come when house current service would be adapted for supplying current to receiving sets. The day has come, and during the last six months much development and research work has brought forth this once thought impossible dream.

The success of the development of B battery eliminators may be attributed to the foresight of many manufacturers. Most important among the apparatus developed for B battery elimination is the production of rectifying devices capable of supplying the necessary current and voltage to supplement dry cell batteries. Equally important is the production of transformers, choke coils and filter condensers to aid in smoothing out the "hum."

It is safe to say that more than 85 per cent of the homes in the United States which are electrically equipped are supplied by the power companies with alternating current. If the alternating current were to be applied directly to the receiving set a disagreeable hum would be heard. making it impossible to distinguish spoken words or modulated musical tones. Why most power companies supply alternating current to their customers is evident. It is much easier and cheaper to transfer from one point to another.

To obtain undistorted reproduction it is essential that the plate supply to the receiving set be absolutely constant. That is, there must not be the slightest trace of alternating hum or surge. This is the prime requisite of all B battery elimina-

There are several methods of rectifying this alternating current, all of which were mentioned in Fulton H. Crawford's article on B battery elimination which appeared in the New York Herald Tribune Radio Magazine April 11, 1926. Therefore it is not deemed necessary to dwell upon this point. It is sufficient to say that the B battery eliminator described on this page employs the use of a full wave thermonic

#### List of Parts

The parts used in the writer's B battery eliminator are mentioned below and were actually selected by him. However, this does not imply their superiority over other standard makes of apparatus, which may be substituted with discretion on the part of the builder.

One Dongan transformer No. 537 (L1, L2, L3), Two Dongan choke coils No. 508 (L4, L5), One Aerovox condenser block (C3, C4, C5, C6, C7). One Aerovox 0.1 mfd. double fixed condenser One UX 213 full-wave rectifying tube (V).
One R. C. A. socket.

e R. C. A. socket. ee Clarostat variable resistors (R1, R2, R3) and necessary baseboard, binding posts, conn

As may be seen from the illustration mounted on a baseboard, which is nine inches wide and fifteen inches long. No strict rule must be followed in placing the parts. The easiest method, of course, is the most logical—that being to start with the input at one end and end with the output the other. This plan was followed

ployed, as is the case in this circuit, the | 110-volt AC. power transformer must have two secondary windings, namely, one for heating the filament and the other for supplying the plate voltage. It is essential that both windings have center taps. The importance of this feature is easily understood after the wiring diagram has been examined, and it will be noted that both the positive and negative terminals of the output are obtained from the center taps of the secondary windings. In the well made transformer this so-called center tap is located at a point where there is always zero potential, or a nodal point on the cycle of the alternating current.

Most fans know that an alternating current first flows in one direction and then reverses and flows in the opposite. The frequency of an AC current is determined by the number of times it reverses per second. The center tap is located at a point where the current does not increase or decrease with the swing of each cycle. If the center taps happen to be misplaced it will cause a "hum" which will be next to impossible to eliminate.

In order to accommodate the UX-213 rectifying tube (V) the filament winding of the transformer should be capable of supplying two amperes at five volts under continuous load. A rheostat in series with the filament cannot be employed to reduce the voltage, as the additional resistance would displace the center tap.

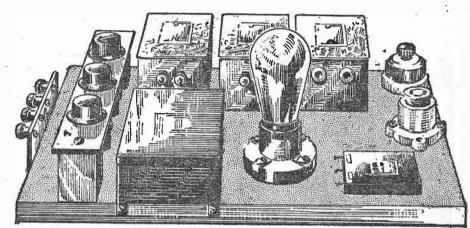
#### Constructional Data

The primary, L1, of the transformer is connected directly to the 110-volt (60 cycle

When a thermonic rectifying tube is em- radio receiver will serve to supply the | and plate secondary windings, which are

The secondary, L2, supplies 220 volts either side of the center tap, which is the required voltage for the UX-213 tube. However, greater voltages should be

positive and negative, respectively. Choke coil L4 is connected in series with the positive output of the rectifier and the output is again shunted by a condenser, C4. Both C3 and C4 are two microfarads each. avoided, as this is the maximum voltage | The second choke coil, L5, is also connected this tube is designed to accommodate. | in series with the positive leg of the partly Each of the two secondary wires either | filtered current, and the high voltage is

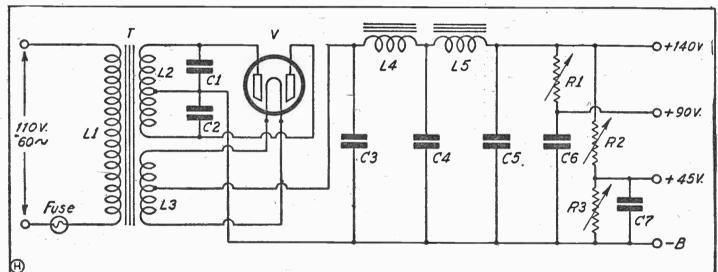


Drawing made from a photograph of the B battery eliminator described on this page

plates of the tube. The UX-213 tube is socket. Inasmuch as there is not a grid element in a rectifying tube, the usual "grid" terminal is the connection for the the component parts of the eliminator. additional plate. That is, one side of the secondary of L2 connects to the terminal marked "plate" on the tube socket, and the other to the one labeled "grid." In reality | pulsating current so when the lag between the UX-213 tube is two tubes in one, with

side of the center tap are connected to the | again shunted by a high capacity condenser, C5. The capacity of this condenser designed to fit the standard UV or UX | is eight microfarads. If the wiring diagram is followed with care there will be no difficulty experienced in connecting up

The purpose of the high capacity condensers and the choke coils, which constitute the filter circuit, is to store up the



Wiring diagram of the author's B battery eliminator using a full-wave thermionic rectifying tube

wires connecting to the plate elements of

in this case) alternating current light | two separate filaments connected in amount of current to compensate for the socket. A three-ampere fuse may be con- parallel, and two separate plates. The nected in series with one side of the line as a safeguard against possible mishap | the tube on the Dongan transformer are to the apparatus is trouble should occur. | red. The center tap of L2 is brown. If excessive current is placed on the battery eliminator the fuse will "blow," autothe entire apparatus for the eliminator is | matically disconnecting the eliminator from the lighting circuit. A "snap" switch connected in series with the primary of the transformer will provide a convenient means for turning the eliminator "on" or "off." A standard extension cord may be used as a means of connecting the device to the electric light socket. Such cords by the writer when constructing this may be purchased in any electrical store. The nearest convenient light socket to the

Top view of the B battery et minater showing the general location of the component parts

The by-pass condensers, C1 and C2, are contained in one unit having a capacity of .1 microfarad, either side of the common lead, which connects to the center tap of the transformer secondary, L2. The other two condenser connections attach to the two leads of the transformer secondary, placing a capacity of .1 microfarad across

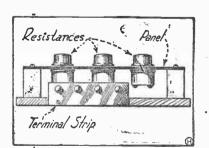
each half of the high voltage winding. The filament winding (L3) is connected directly to the filament terminals on the socket. The center tap of the filament winding provides the positive connection of the B battery eliminator.

The alternating direct current has now been rectified to pulsating direct current interrupting at 120 times a second. The next object of the B battery eliminator is to convert this pulsating direct current to constant direct current and to reduce all interruptions or surges of any kind. This is accomplished by means of the filter.

The filter system of this B battery eliminator consists of a number of high capacity condensers connected in shunt with the rectified current, and two large audio choke coils in series with the positive

Condensers C3, C4, C5, C6 and C7 are | ing post marked 90 volts. The .1 microall concealed in one unit, which greatly | farad condenser C6, which is included in facilitates wiring. These are known as the B block, is connected from the binding "B blocks" and are being placed on the post to the negative side of the rectified market by several reliable manufacturers. | output. Condenser C3 is connected directly across the rectified high voltage obtained from the two center taps of the filament

The typical radio receiver of to-day has one or two stages of radio-frequency amplification, a detector and two or three stages of audio amplification. The audio usually requires from 100 to 200 volts, while the radio-frequency amplifier seldom requires more than 90 and the detector 45 volts. The high voltage output of this B battery eliminator will be about 140 volts, and it is, therefore, necessary to employ some means of reducing it to a lower value for the radio-frequency amplifier and detector tubes. This is accomplished by means of resistance R1, R2 and



End view showing the binding posts and method of mounting the variable resistors

R1 is connected in series with positive side of the rectified voltage and the bind-

Resistance R2 is connected in a similar

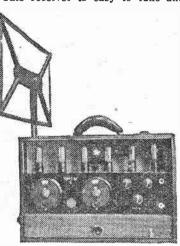
(Continued on page three)

#### News and Notes of the Radio Trade

be distributors of radio equipment in

The American Interstate Radio the metropolitan district. 'The new

Service has made a very opportune company will have its headquarters announcement by the introduction of at 225 West Fifty-seventh Street, at the Rambler Six-a six-tube portable the corner of Broadway, and will This receiver is easy to tune and



carry, and sells for a very low price. The Rambler Six also comes in kit form for those who prefer to build

A Condenser for Tandem Tuning The present trend of radio progress may be described as a movement more circuits by condensers with ro- tic quality reproduction. It is but tors mounted on a common shaft—is six inches high and is readily adapta step in this direction. The "Siam- able for placing in any nook, corner Amsco and designed to meet the exigencies of simultaneous tuning recently has been placed on the market. Admitted to Membership in R. M. A. Aside from the mechanical conplates, plate sections and terminals, products, have been admitted to memciency, particular care enters into the matching of the unified condensers, qualifying the unit for its spe- R. M. A. convention held in Atlantic cific purpose of tandem tuning. The City. two condensers are matched within one micromicrofarad, a painstaking

to successful tandem operation. The condensers are of the straight line frequency type (which particularly recommends them for single control superheterodyne work), ranging in sizes from .00025 mfd. to .0005 mfd. (individual capacities).

A Tube Briefly Described The three essentials of a good radio tube are all around operating and uniformity. These essential new type (UX) tubes. This socket reach quickly. characteristics are guaranteed to be is also made with binding posts. embodied in the Myers tubes by their manufacturers, the Myers Radio Tube Corporation of Cleveland, Ohio.

The three principal elements of Myers Tubes, namely the plate, the in a framework composed of nickel. both the top and the bottom of these The advantages to be obtained by amplifier. this mechanical construction are high mutual conductance, high amplification factor, and the absence of microphonic effects.

Myers Tubes, by means of a special process, are evacuated to the highest degree, so that even though the spacing between the elements has the spacing between the elements has been decreased, yet it is possible to MAKES your vautilize in the plate circuit a potential as high as 200 walts which is tial as high as 300 volts, which, if used in connection with the proper bias, enables the user to obtain great volume without distortion.

Metropolitan Jobbers Merge John W. Weber Jr., Inc., and the Rance Corporation, radio wholesale firms, have combined to form the Weber-Rance Corporation, who will



# Radio Station to Serve the Aquatic

(Continued from page three)

The officers of the Weber-Rance the output for telephony 100 watts. maneuvering. Corporation are John W. Weber jr. It must be remembered the use of Design and installation work were and sales manager, and Harold O. on board boat is equivalent to a Mr. F. B. Ostman, of the A. H. Grebe ter follows: Becker secretary and treasurer. The transmitter many times more power- engineering department. Mr. Douglas chairman of the board of directors is ful at some land station, since the Rigney, owner of the boat and an T. H. Wickwire jr., who is well known radio waves travel over water notably officer of the Grebe Company, superthroughout the industry and identi- better, due to absence of energy vised the installation, which 'ook Broadcasting Station WJZ, fied with several prominent radio absorption from closely surrounding three days to complete. objects. Meters have been provided Among the lines of radio equip- in all important circuits so instant ent to be carried by these dis- check can be kept on the correct perributors are Bosch, Ferguson, Balk- formance of the transmitter. Tube lines of all ACF cruisers in sturdy te, Ray-O-Vac, Perryman, Amplion, filaments and plate voltage is con- marine construction. The keel is of Saal, Philco, Bright Star and Gould trolled from the transmitter panel. Oregon pine in one length and the Saal, Philco, Bright Star and Gould trolled from the transmitter panel. Unipower. The company plans to Special rheostats provide for minute frames are of steam bent oak. The from the time it takes this letter keep the metropolitan and adjoining voltage adjustments. territory thoroughly covered with a Plate Voltage Supply

Plate voltage is obtained from an Esco 32-volt D. C. drive generator, which will supply 1,500 volts. The The Charles Freshman Company, current consumption varies between Inc., manufacturers of the popular 26 to 32 amperes. High ampere-hour capacity storage Exide batteries have

line of tuned radio frequency receivers and B battery eliminators, sufficient capacity to permit as much as eight continuous hours of broadannounce the introduction of a new type of loudspeaker. casting if necessary and as previously mentioned, operation for a The speaker is of a very novel construction and incorporates a special longer period than this may be had toward the elimination of controls. struction and incorporates a special by operating direct from Delco gen-Tandem tuning—the tuning of two or affords wonderful volume and realis-

Variometer type antenna tuning for transmitter eliminates the use of tap connections, making for greater efese" condenser manufactured by or on top of or alongside the radio ficiency and ease of operation. The inductance coils in the closed or oscillating circuit are of low loss

The De Jur Products Company struction, which insures perfect elec- of New York City, manufacturers of trical contact between individual the De Jur rheostat and other radio essential to general electrical effi- bership in the Radio Manufacturers definite wavelengths may be quickly

sales force of at least ten men.

Master Speaker

Socket for UX Tubes The American Hard Rubber Comaccomplishment, but quite essential pany of New York are the manu-



Kit of Resistance Units

grid and the filament, are held rigidly placed on the market a kit of eight nections in the fore and aft cabin and country before the voyage of Columfixed resistances for use in B bat cockpit permit the plugging in of a bus. It is possible that a few brief insulated at the proper points by means of pyrex glass. The elements supplied in various sizes and the kit number of points for reception of will also be delivered by Communications. are supported in this framework at includes one 750-ohm unit, three broadcast entertainment. 1,500-ohm units, one 3,000-ohm unit, elements. This construction holds one 3,500-ohm unit and two 5,000-ohm matically controls the connecting of the elements with relation to one an- units. Each unit is capable of dis- the receiver in or out of circuit. other in a fixed position, so that they sipating 20 watts of energy. The A special switch has been provided, cannot be displaced through even un- units are approximately two inches however, so that if desired the transusually rough handling, and that vi- long and three-eighths inch in di- mitter may be monitered by checking bration or other mechanical distur- ameter. By connecting several of up on the transmissions in the rebances do not alter the characteris- these units in series across the out- ceiver. The speech amplifier, crystal tics of the tubes after they are once put terminals of the B battery elim- control oscillator and receiver thereassembled. It also permits the use inator it is possible to obtain inter- fore afford three means of practical of smaller elements, thus reducing mediate voltages of practically any transmission check up. the internal capacity of the tube and desired value for the operation of the allows smaller spacing of the ele- detector, radio frequency amplifier mercial 600-meter reception were ments with relation to one another. and first stage of the audio frequency made, as were the transmitter key con-

Rugged construction and practical de-The transmitter has been designed sign have particularly been considered receiver, weighing twenty-five pounds maintain a branch at 1271 Bedford for key operation if it is desired at in the aerial, designed since severe proof is in the form of a letter rewith all equipment. It is equipped Aveune, Brooklyn, the quarters for any time to transmit by code. Four weather necessitates sturdy constructive delivery delive with a loop and can be set up in merly occupied by John W. Weber 50-watt tubes are used; two osciltion and the aerial must not in any missionary at Shingle Point on the

The new MU-1 follows the general

planking is of Oregon pine and the decking is of teak. The forward cabin radio equipment of station WRMU. Berths of Pullman type and wicker furniture complete the furnishings. The after cabin has a series of Pull-

man berths, additional wardrobe closets and dressers with roomy drawers. The galley of this oceansink, icebox and everything to permit the best table and service a meticupanels and neatly disposed essentials excites hunger as well as radiates hospitality.

Smooth and silent high power Hall muda bout, which is scheduled to oc All connections are made by a plug and jack system of heavy construction to reduce losses, and to add efficiency coils specially designed for

A quartz crystal oscillator makes possible correct adjustment for con-To Speak at Ceremonies stant frequency.

The speech amplifier, or mixing except by a limited number of people the splendid programs that we have panel, is of the latest design, em in the nation can be enjoyed by enjoyed from your station. Wishing ploys three tubes and permits the thousands from almost every other you every success during your presmixing or fading from one program aspect, for on Saturday afternoon, ent year. Very sincerely yours, or microphone to the other, with no beginning at 3:30, WEAF and WCAP abrupt change. This feature may be will broadcast the proceedings of the more clearly understood by a com- official ceremonies in connection with parison with the compound stereopti- the unveiling of the statue of Leif con where one picture is brought in Ericsson in Washington, D. C. clear while a simultaneously fading WEAF's audience will again have of the other is effected. Microphone the opportunity of hearing the voice onnections, fore and aft, make in- of the nation's Chief Executive, stantly available the broadcasting President Calvin Coolidge, who will efficiency, ruggedness of construction facturers of the radion V-T socket for wise too difficult or impractical to American people. There will also be from special vantage points other- make an address on behalf of the

> The Receiver Employed A Grebe synchrophase, especially designed to cover commercial, as well tion by Americans of the explorations The Ward Leonard Electric Com- as the broadcasting wave bands, is pany, of Mount Vernon, N. Y., have used for receiving. Handy plug con-

> > The send and receive switch auto-

Receiver provisions for the comnections for emergency use, if ever it

SENSITIVITY.

**PORTABILITY** 

Crown Prince of Sweden

an address by the Crown Prince of Solidly Sweden, which will be in the nature of an official response to the recogniof the hardy Norseman who is genwill also be delivered by Congressman Carl R. Chindblom of Illinois.

**Enjoy Radio Programs** The aerial is an inverted "L" type, With the attention of the world flat top, designed for maximum radia-Sport Loving Fan tion surface, constructed of heavy the many audacious attempts to tion surface, constructed of heavy centered on the polar regions through throughout with Pyrex strain, stand- reach the pole by the air route, off and deck lead-in insulators. Station WJZ has proof that it almost reaches the pole every night. The lators and two modulators, making way interfere with bridge or deck Arctic Coast, Alaska, which is now framed with its postmarked envelope president, M. L. Miller vice-president this power in an efficient installation done by Mr. William F. Diehl and and hangs in WJZ's studio. The let-

> Church of England Mission, Shingle Point, Arctic Coast, January 15, 1926.

New York City, N. Y. Dear Sirg: We wish to express our apprecia-

to reach you, to appreciate something contains the control apparatus and of our isolated position. In spite of the distance when conditions are favorable we can get very clear reception on our loud speaker. We heard very clearly and greatly enjoyed on the morning of January 12 going broadcaster has large stove, the opening program from your new super-power station at Bound Brook lous host could desire. The very ap- However, as we get London direct we were not so disappointed as we otherwise might have been. Our mission is situated on the

Arctic Coast about 100 miles east or Scott engines insure ample speed. the Alaska-lukun boundary inc, and our work is among the Eskimo people The MU-1 will make its bow as a who live along the Arctic Coasts racing boat in the New London-Ber- Needless to say the Eskimos are cupy 105 hours. Prior to this, how- of the human voice being carried ever, the MU-1 will be in attendance thousands of miles through the air at many races in the rivers and har- and then reproduced by the receiving

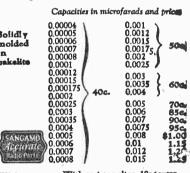
As we have not seen the sun for nearly two months we have enjoyed and appreciated the radio very much, A ceremony which cannot be seen and we again wish to thank you for

THE REV. A. W. GEDDES.

Mica Condensers

in intermediate sizes

Improve Tone, Range and Volume



# Radio Exchange

Rate, 40 cents a line. Ads. accepted until 12 o'clock noon Friday.

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Parts and Equipment

THE NEW PATENT PENDING
"SUR-LOC" CONNECTOR
The missing link of the Alkaline typestorage "B" Batteries. Admitted the greatest improvement to date 15% to 30% sreater capacity over the crimped on pressure connectors. Four times as much metal in connector over any existing types. Positive element which swells and contracts in charging and discharging cannot become loosened as in crimped connector. Positive element which swells and contracts in charging and discharging cannot lecome loosened as in crimped ing cannot lecome loosened as in crimped connector. Positive element which swells and contracts in charging and discharging cannot lecome loosened as in crimped ing cannot lecome loosened as in crimped connector. Positive element which swells and contracts in charging and discharge connector. Positive element which swells in the connector and tighter if you try to with fingers Much longer length of charge are moved in the connector and tighter if you try to remove. Negative likewise slipped in the connector and tighter if you try to remove. Negative likewise slipped in the connector and tighter if you try to remove. Negative likewise slipped in the connector and tighter if you try to remove. Negative likewise slipped in the connector and tighter if you try to remove. Negative likewise slipped in the connector. Positive elements connected with our special connector. All batteries shipped American Express C. D., or send money order or check. See Jay Battery Co., 917 Brook Ave., which is the provided the provided

SERVICE

SPEAKERS, UNITS, HEADPHONES, REPAIRED WHILE YOU WAIT. SETS BUILT, REWIRED; WEAK TUBES REVIVED, 50C. ROYS, 100 WEST 46TH ST., CORNER 6TH AVE.

Parts and Equipment

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The Best Portable Buy of 1926

VOLUME

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of its kind at any price.
OUD SPEAKER REALLY a Rambler — weight only 25 lbs. with all equipment.

CELLING at half

**SELECTIVITY** 

SOMETHING NEW! A Knockdown Kit for Portable Sets WRITE FOR PRICES
MAIL ORDERS PROMPTLY FILLED

American Interstate Radio Service

183 Greenwich St. New York City

Testing Batteries

have some one do it for you.

The Ground Connection

we have water pipes, gas pipes and

radiator pipes.

### Show That Radio **Waves Split in Two**

radio waves split into a ground wave and a sky wave in passage from transmitter to receiver, has been found in preliminary compilation of data secured by radio engineers of the General Electric Company in broadcast wave propogation tests conducted from January 1 to May 8.

According to the split wave theory ably about 100 miles or so above the earth, continues until reflected down upon the receiver by a semi-conducting layer in the atmosphere. The ground wave weakens rapidly and becomes negligible about 200 miles from the broadcasting station and re-

In conducting propagation tests with the co-operation of radio listen- a novice we might say this to him: looking at the bulbs themselves. If known to depend largely on the barometric pressure over various parts of the country, and radio engineers endeavored to find a relation between reception records and the barometric pressure through which the waves had passed. From present analysis of data it seems probable that barometer and weather have only a minor effect on radio conditions. The data do show that signals received at short distances are stronger when they have come along a region of even pressure than when they have come from a low pressure area to a high pressure area, or vice versa. At distances of more than 400 miles.

the General Electric engineers were first with the one-tube set before he and one minus (-) terminal on each tions of Smith-Rose have shown that made on all stations received by the attempts to work a loudspeaker. The of the 221/2-volt "B" batteries. Con- directional errors are obtained with a listener and they covered practically one-tube set, as a rule, has but few nect two short wires to these termiall stations on the air on wave controls, that is, few knobs and dials nals and with the two wires touch the atmosphere must be responsible lengths covering the entire band re- with which to make adjustments, and the two metal parts of the incandes- for the production of abnormal served by the Department of Com- for the novice the fewer adjustments cent lamp. Unless the lamp lights, polarization of the waves. Further merce for broadcasting and on powers there are the better. More than one or both batteries are dead. In experiments made by Smith-Rose and

cated that there had been a change If you have more money to spend that the plus (+) and minus (--) deviation of the waves, such as would in conditions from January to Feb and wish to get a larger outfit—one connections match up with the mark- be produced by a tilted ionized layer, ruary. In the study of January re- that works on a loudspeaker—there ings on the binding posts. Plus (+) does not exist, so that we must reports, it was found that most of the are any number to choose from. As must connect with the plus (+) and gard the influence of the earth's bad fading reports came from a a rule an outfit with less than three minus (-) must be connected with magnetic field on the properties of definite region between 200 and 400 tubes does not work a loudspeaker miles from the transmitter. The well. To get long distance (DX) sta-February reports, however, indicate tions clearly it is best to have at now one of the worst obstacles to perfect broadcast service and they the apparatus itself.

strength at various distances from a lamps or vacuum tubes. It is usually be insulated, contrary to popular initial appearance at WEAF to-day broadcasting station the engineers a storage battery, or when dry cell opinion. The radio waves pass easily and will be heard in a program of found, from the reports, that the tubes are in the set, dry cells may through all insulation, so it makes no one-half hour's duration beginning at signals decrease rapidly in volume be used. for the first 300 miles. This is true of all transmitters, no matter what the power. The high power stations, high tension battery. In order to while they decrease just as rapidly, memorize this better, I suggest that of wire. If you must use more than heard during this rado program will give stronger signals at all distances. you associate the letter "B" with give stronger signals at all distances. Jou associate the reason is that unless one piece, do not attempt to just be "When Twilight weaves a Golden From 300 to 800 miles away the beware. The reason is that unless twist the wire ends together or you Dream" by Beethoven, "I Sing Besignals seem to remain fairly con- you are careful, the "B" battery will stant in strength and seem to depend cost you a good deal of money. It largely on the radio conditions. In makes a huge difference how the two January signals were stronger 600 batteries, the "A" and "B" types, are miles from a transmitter than at 300 connected. Every radio outfit has, as miles. In February this was no a rule, two binding posts marked for longer true. In fact, there is considerable evidence that radio recepture and "A" and "B" batteries. It is absolutely essential that the "A" battery tion was everywhere poorer in Febru- be connected to the "A" binding posts ary than in January. As indicated and the "B" battery to the "B" bindabove, this change in transmission is ing posts. due to some change in the upper atmosphere rather than a change in weather conditions on the earth.

Time Controlling Switch Ushichiro Tokumi, a Japanese inventor, announces the perfection of a time controlling switch which may be

The device may be mounted on the panel of any receiving set and serves

### Propagation Tests Information for the Novice on Proofs Available of Selecting and Operating a Set Existence of Ionized

Substantiation of the theory that Crystal Receivers Provide Local Programs; One-Tube Outfits Give DX on Headphones, but Five-**Tube Sets Required for Loud Speaker** 

By Hugo Gernsback

F ALL the people, the radio beginner-or shall we call him novice?—is entitled to the greatest amount of sympathy; and he of all people does not get much of it. Perhaps the radio industry itself is most to blame for this condition. Too often in the past has the novice gone to a radio store, only to be sneered at and while for the night-time phenomena one wave passes along the earth and have fun made of his questions that seemed logical enough to him, but it has been proved that the interferthe other, passing into the air prob- foolish to the "know-it-all" behind the counter. Even to-day, this feel- ing rays come down from the upper ing has not been eradicated entirely, and it is therefore small wonder atmosphere and do not travel in a that the beginner is not always very anxious to become initiated into horizontal plane. the mysteries of radio.

There are two sorts of novices: which is an indication that either The one who buys a set complete and the "A" or "B" batteries are getting quately explained by a theory of the one who buys parts, in order to low. Sometimes it is only the storconstruct the set himself. For the age battery that is discharged or man who buys the outfit already as- the "A" dry batteries run down the under-boundary of the deviating sembled his task is simple. If he is This can be usually ascertained by

tions only start in, by all means, recharging; otherwise, the dry cells tion may be made of the extension of with a small crystal set. The crystal will have to be renewed. Dry "A" the ionic refraction theories of set requires no batteries and uses a and "B" batteries cannot be re- Eccles and Larmor made by Appleton pair of telephone receivers. It is charged, notwithstanding the claims and by Appleton and Barnett in which not possible to attach a loudspeaker made by a lot of wiseacres. The the effect of the earth's magnetic to a crystal set, as the power deliv-only thing that run-down dry cells field on the phase-velocity of wireless ered by it is very minute. For purity are good for is the ashcan. of sound the crystal set has no peer; If the "A" battery has been rehowever, it does not work well as a newed and still the outfit does not the atmosphere are electrons, as rule for greater distances than fif- work well, the "B" battery probably seems most probable, the formulæ for teen miles. The tuning of most is run down as well. Here is a sim- the phase-velocity given by Eccles crystal sets is not very sharp either, ple test to find out if the "B" bat- and Larmor require considerable broadcast station it will be almost carded impossible to tune that station out in order to receive another one. Long distance stations cannot be received except under unusual conditions.

however, the conditions on the sur- is a one-tube set. There are some battery. If the lamp does not light face of the earth seem to have little very excellent sets of this kind on up at all the "B" battery is dead. or no effect. On the basis of the the market, some of these being able This test can only be made with a split wave theory of transmission, it to occasionally receive stations 2,000 45-volt "B" battery or two 221/2-volt becomes obvious that if the sky wave miles away. These sets as a rule also "B" batteries, which, of course, must goes through an arc reaching 100 work with a pair of head phones. If be connected in series in order to phere should be of elliptical polarizamiles or more above the earth, a loud speaker is to be added you make the test. By series is meant tion, so that we have here a possible weather conditions, which are known need what is called an amplifier, attaching the plus (+) terminal of theoretical basis for the explanation to go up less than ten miles, can have which means one or two more tubes one battery to the minus (--) termi- of direct-finding errors originally adand more batteries. I suggest to the nal of the other with a short piece vanced by Eckersley and Bellini. It Reports received and tabulated by novice that he make himself familiar of wire. That will leave one plus (+) may be mentioned that the investigadial makes tuning somewhat compli- connecting "A" and "B" batteries Barfield on the Adcock system of

The batteries are of great im- come in contact with the building, power of the broadcasting stations is portance. All vacuum tube sets have with the window molding, etc. Where the only remedy for fading now two kinds of batteries: First, the In studying the average signal rent for lighting the filaments of the matter of fact the entire aerial can at Hackettstown, N. J., will make its

Next, we have the "B" battery or

"B" E W A R E . therefore, not to change these connections. If you do, and if you have a five-tube set, this slight mistake is apt to cost you \$10 pipe. But again here is where the

as a time indicator in addition to the automatic switch. Patent is pending.

\*This talk was broadcast from station scraped metallically clean where the WRNY by Hugo Gernsback, editor of ground clamp is attached.

\*This talk was broadcast from station ground clamp is attached.

\*Casting will be done through wall, scraped metallically clean where the ground clamp is attached.

Atmosphere Layer

According to papers presented by the British National Committee for Radio-Telegraphy at the recent international radio-telegraphy meeting at Washington, direct proofs are available of the existence of an ionized layer in the upper atmosphere.

"The results provide direct ex perimental proof," says the British

day and night phenomena are adediurnal variation, itself based on laver is higher at night than during If you have not much money to they emit a very dim light, the trical processes by means of which spend and wish to receive local sta- storage battery, if such is used, needs rays are deflected by the layer, men-

by that is meant if you are near a tery is still good or must be dis- modification, the terms arising from the recognition of the magnetic field being of importance except in the case of ultra-short waves. It is found Take an ordinary 25-watt, 110-volt that the atmosphere acts to wireless lamp such as you use in your house for lighting purposes. Connect the two metallic parts of the lamp to the two extreme terminals of the "B"

The investigation of fading indi- cated until you get the hang of it. | with a set it is of extreme importance | direction-finding show that lateral the layer as largely responsible for

the complex polarization. "A more detailed investigation of I now come to the aerial-one of that equally bad fading occurred at least a five-tube receiver. The store- the most important parts of your out- the magneto-ionic theory shows that all distances beyond 200 miles and keeper will be glad to show you how fit. For best results, the total length such complex polarization is produced was not confined to any particular to operate it. The operation of most of your aerial should be less than only when the time between two colzone. Ten per cent of the reports of these sets is very simple after you 100 feet. It must be insulated from lisions of an electron and gas molerecord bad fading, 35 per cent slight have become accustomed to working all points on the building with good cules is long so that directional errors fading and 55 per cent no fading. it. The thing that you should not insulators. By 100 feet I mean the should be most pronounced at night They emphasize the fact that this is tamper with until you understand total length of the wire from your when the layer is high and in a re-

First Radio Program To-day "A" battery, which supplies the cur- must positively be insulated. As a Collegiate Institute for Girls, located difference whether the wire is in- 6:50. The Glee Club will be under sulated or not, but the wire must be the direction of Miss Elsie Gardner, insulated wherever it touches stone. with Miss Charlotte Howard assistcoping, woodwork, walls, etc. The ing at the piano.

best aerial is an uninterrupted piece Among the selections which will be one piece, do not attempt to just be "When Twilight Weaves a Golden be "When Twilight Weaves a Golden Dream" by Beethoven, "I Sing Because I Love to Sing" by Pinsuit, "The Summer Winds" by Bishop, Trio with solo by Miss Gardner, "In the Time of Roses" by Reichardt, "To a Wild Rose" by MacDowell, with violing obbligate by Mrs Julia Larsen, and Mail Orders Filled; Include Postage will have trouble. If you cannot cause I Love to Sing" by Pinsuti, solder the pieces together yourself, "The Summer Winds" by Bishop, Trio The ground is all important. By Wild Rose" by MacDowell, with violin ground is meant a connection direct obbligato by Mrs. Julia Larsen, and to Mother Earth. Any continuous "The Night Bells" by Vincent. The wire or metallic object that makes a twenty young ladies who compose permanent and good union with the the Glee Club represent seven difearth is called a ground. As such ferent states.

"Les Pecheurs des Perles"

The safest bet is always a cold-water By WEAF Grand Opera Co. The grand opera "Les Pecheurs des little thing is important. Do not Perles" (The Pearl Fishers) will be in the twinkling of an eye, as you attempt to just wrap the ground broadcast by the WEAF Grand Opera will burn out all your vacuum tubes, wire which connects to the ground Company in tabloid form to-morrow After you have used your "A" and binding post of your set—around the evening, beginning at 10 o'clock East-"B" batteries for a certain length of Get a 10 or 15 cent ground clamp vocal and instrumental portions of applied to turning a radio receiving time you will find that the sounds from your radio store and attach it this grand opera will be under the in the loud speaker or telephone re- to the cold-water pipe. The impor- direction of Cesare Sodero and broadceivers gradually become weaker, to the cold-water pipe. The third will be done through WEAF

Here's

"WHEN Cleartron Type CTX 201 RF Tubes were inserted in the R. F. amplification stages of a neutrodyne, there was an immediate improvement in

Extract from a letter from R. F. Gowan

England's Long-Distance



6 Warren Street



Ware ME UNITED SANCE Receivers \$9.99

Reg. \$65.00



Bargains in Parts Radio Exchange of Radio Magazine

"Weak signals were louder, and we were actually able to bring out intelligibly stations which could not be received with the ordinary

Former head of De Forest Radio Laboratories. Originator of the Honeycomb Coil. Now Chief En-gineer Hudson Radio Laboratories.



R. F. Tube





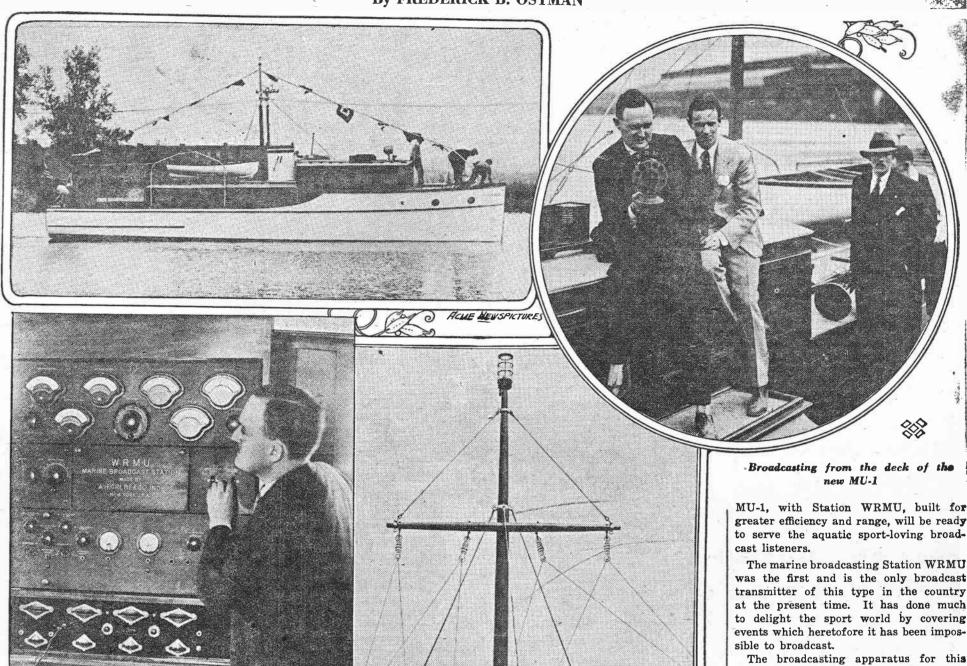
A 3-tube compact dry mellow, clear-toned

Are Advertised in the the Herald Tribune

Marine Broadcasting Station to Serve the Aquatic Sport-Loving Radio Listener

The New M U-1 Is Fully Equipped With Modern Transmitting and Receiving Apparatus

By FREDERICK B. OSTMAN



broadcast transmitter described in this article. Above—The cruiser MU-1

ITH the launching of the new de-luxe cabin cruiser MU-1 early this month at the Jackson & Sharp yard of the American Car and Foundry Company, Wilmington, Del., an innovation in radio broadcasting was

Ruth Rigney, four-year-old daughter of Douglas Rigney, treasurer of A. H. Grebe & Co., smashed a bottle of champagne on the bow, christening the vessel the MU-1. Instantly following the boat slid down the ways proudly into the waters of the Dela-

Many radio fans will be interested to know that in this cabin cruiser is contained the completely equipped marine broadcast Station WRMU, designed to operate on 63 meters for relay work and and transmitter have been principally designed to broadcast aquatic sporting MU-1 include the New York-Bear Moun-

caster last year, also called the MU-1. Many race events for the radio public were covered, including the gold cup regatta, held under the auspices of the Columbia Yacht Club of New York. The Other events on the schedule of the sesquicentennial celebration.

events as did the original marine broad- | tain race on the Hudson River; the New York-Block Island race; the race from Larchmont Yacht Club to Gloucester. Mass.; the triangular event from Sheepshead Bay Yacht Club-Jones Inlet-Scotland Light Ship, and various events near on 236 for direct broadcasting. The boat | gold cup races will be repeated this year | Philadelphia in conjunction with the

To cover these feature events, the new

transmitter of this type in the country at the present time. It has done much to delight the sport world by covering events which heretofore it has been impos-

The broadcasting apparatus for this work has been carefully designed, incorporating features not found in the equipment on last year's yacht and from the experience obtained it has made possible the construction of equipment many times more efficient and powerful. Rugged features so necessary for marine installation, plus refinements for high quality broadcast transmission, have been incorporated. The transmitter has been designed with greater power output than that which ordinarily will be used, insuring reliable transmission over good distances under extremely adverse conditions.

Power and control panel installation was designed and installed by Claude Vermilye, engineer of the Metropolitan Electric Manufacturing Company of Long sland City. The power and control panels contain meters which show the battery voltage and current consumption at all times. Switches control all circuits. Delco charging plant, etc. A special knife switch for emergency use has been provided to permit the operation of the transmitter direct from the charger should the battery circuit become damaged at any time.

(Continued on page eleven)

### An A. C. Plate Supply Unit Designed for a Full-Wave Thermionic Rectifier

(Continued from page two)

A close-up view of the antenna used on the cruiser MU-1

manner and its purpose is to reduce the high voltage to the proper value for the detector tube. Condenser C7 (one microfarad) is connected across the positive detector binding post and the negative lead.

The resistance R3 may be either fixed or variable. The writer happened to choose one of the variable type. However, a fixed resistance having a value between 7,500 and 10,000 ohms will answer the purpose equally as well. This resistance is connected directly across the detector output, as indicated in the wiring diagram.

The builder may mount the resistances in any manner he chooses. After they have been once adjusted so that best results are being obtained there is no further cause for disturbing them. For this reason there is no cause to fit them up with an elaborate mounting. The writer World Radio History

inches wide and eight inches long, sup- | tor makes it highly desirable. Makers of

ported by two pieces of wood sufficiently high enough to prevent the resistances from touching the baseboard. Four binding posts are necessary—one

for the negative connection, one for the detector positive, one for the radio-frequency tubes and one for the audio tubes. These were mounted on a small strip of composition and placed near the re-

The completed eliminator will supply 140 volts at 65 milliamperes, which is ample for any receiver on the market at the present time. When it is considered that the average five-tube radio frequency receiver does not consume more than 30 to 35 milliamperes on the plates of all the tubes, there is plenty of available power.

The high voltage feature of the elimina-

commercial radio receivers during the past year or more have been prescribing the use of at least 130 volts on the plates of audioamplifier tubes. Most manufacturers of transformers have changed the design of their products to stand up under the increased voltage. Resistance coupled audio amplifiers also require a high plate voltage due to the resistance connected in series with the plate supply.

When the B battery eliminator is used in actual practice it should not be placed nearer than three feet from the receiving set. It is also desirable to place it considerable distance from the antenna lead in wire. These points tend to reduce any possible hum which might be induced into the receiving circuit.

It is possible to further reduce any of

the AC hum by grounding all metal boxes or containers of the component parts. A still better plan is to have a copper case made by a tinsmith to fit over the entire unit. The case should be grounded and a hole drilled over the rectifying tube to allow the air to circulate, thus preventing the tube from overheating.

As a matter of precaution it is a good plan to place the eliminator out of reach of any children. The high voltage output, while not extremely dangerous, is capable of giving a severe shock or burn.

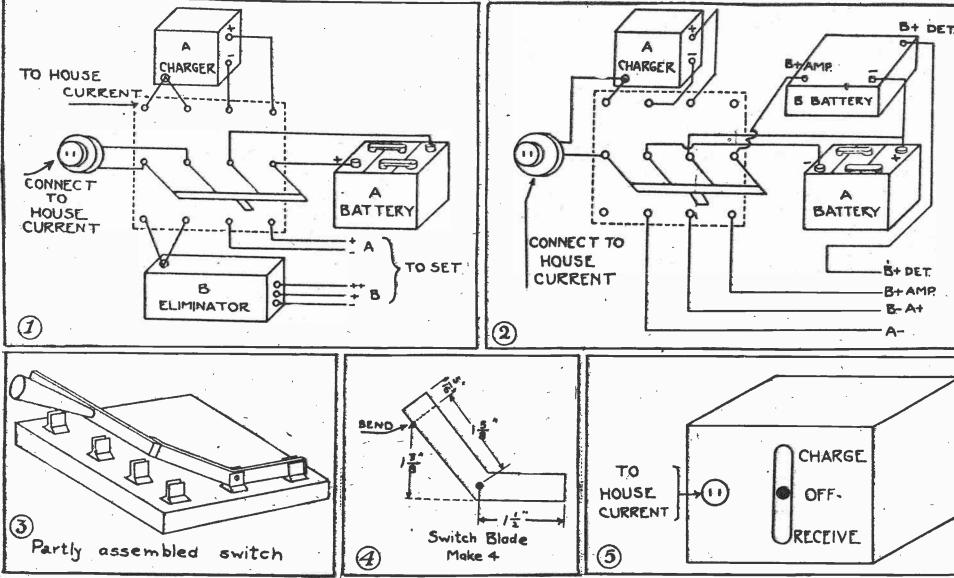
This B battery eliminator has been in actual operation at the writer's home for

the last few weeks, supplying the plate current to a five-tube receiver, and it is impossible to detect any alternating cum rent hum in the loud speaker. This alom is proof of the fact the B battery eliminate tors may be made to operate the head current-consuming radio receiver.

# How to Construct a Switch for Controlling A Battery and Charger Circuits

May Also Be Used To Control Set; Standard Switch Parts Used

By R. C. HITCHCOCK



THE many people who have their prising to find how few have any convenient method for quickly and easily connecting their storage batteries to their chargers. The most usual method seems to be: (1) Disconnect battery from set; (2) connect charger to battery, and (3) plug in charger to house current. Some chargers can be left connected to the storage battery all the time, but this cannot be done in some chargers, as the charger is grounded—and as the A battery is also grounded through the set, a short circuit of the house current is likely to occur. A simpler system of connections using a single master switch with several blades is here presented.

Two switches are shown to fit the two most-likely requirements. Figure 1 is for

the radio installation, which comprises a | ferent connections is shown—it provides B battery eliminator, storage A battery and charger. Figure 2 is for the radio set having storage A battery and dry cell B battery. In the diagrams the switches are inclosed in dotted lines. Considering Figure 1 first—throwing the switch down connects the house current to the eliminator and connects the storage battery to set-this is the "receive" position. Lifting the switch up disconnects both the eliminator and storage battery with one off except when the set is being usedthis is the "off" position. Throwing the switch to the top of the figure connects the house current to the charger and also connects the storage battery to the

charger, this is the "charge" position-

for connections for A and B batteries and for A battery charger. It will be seen that the B negative and A positive are left permanently connected, as they are in most sets. Throwing the switch to the upper position in Figure 2 places the A battery on charge; throwing it down connects A and B batteries to set. (The B plus detector wire is left permanently connected to the set.)

The switch might consist of two regular double pole double-throw knife switches fastened to a hard rubber bar equipped with a new handle. However, as an improvement on the usual 180 degree throw switch a quick throw switch is used. By using a "bent" switch lever the total throw need be only a little greater than In Figure 2 a similar switch with dif- 45 degrees and the switch can be put into

a cabinet, with the handle projecting for operation (see Figure 5). The dimensions for an ordinary battery knife switch lever are given in-Figure 4. In making this lever note the dotted line in Figure 4 where the lever is bent so that it may be bolted to the common bar. The regularly supplied switch levers are removed by filing off their rivets. Four new switch blades are made of sheet brass or copper, according to Figure 4, or to suit the switch used, and are fastened in the center posts. using small machine screws and lock nuts. or single nuts soldered to prevent their working loose. If the switch is to be mounted in a cabinet, as suggested in Figure 5, a small plug inlet for the house current may be put on the outside, and the

# The Vacuum Tube's Contribution to the Quality of Reproduced Music

By Dr. Alfred N. Goldsmith Chief Broadcast Engineer Radio Corporation of America

HE quality of reproduction of music in the home depends, as has been pointed out in earlier articles of this series, on many elements at the transmitting and receiving stations. The contributions to musical quality from the transmitting and receiving set have already been considered, and it has been pointed out how important it is that each of these, and particularly the receiving set, shall be acoustically synchronized. Acoustic synchronizing, or the accurate re-creation in the home of the sound waves produced in the studio, is the determining factor in the enjoyment of radio programs. Few people realize the very important part played by vacuum tubes in the receiving set as regards quality of musical reproduction and the real necessity for exercising discretion in the choice of the vacuum tubes used and for maintaining them and their batteries in good operating condition.

From the standpoint of securing real musical results in the home, tubes must meet a number of difficult specifications. While high-grade tubes do, as a matter of fact, meet such specifications, it is by no means uncommon to see the entire circle of broadcast transmission and reception broken and tone quality ruined by the use of unsuitable or unreliable vacuum tubes. Considering, first, some of the electrical

constants of the tubes and without going into the technical details of the matter, vacuum tubes have a certain characteristic which is known as the amplification factor. If the amplification of the tubes used in the receiver is too small, weak and unnatural sounding signals will result. If, on the other hand, the amplification is too great in its relation to the design of the receiving set, the receiver may "oscillate" or produce squealing or howling notes which cannot be conveniently eliminated or controlled.

Another important constant is what is known as the "internal impedance" of the tube. Roughly speaking, this is a measure of the opposition of the tube to the flow of plate current through it. It is the factor which limits the current drawn from the B battery. If the internal impedance is too small there will be an excessive drain on the plate batteries without corresponding advantage and plate battery renewals will be uncomfortably frequent. On the other hand, if the internal impedance is too high, weak signals of unsatisfactory character will be produced and tone quality on the average loud speaker will be distinctly unsatisfactory. Accordingly, internal impedance of vacuum tubes must also be held within carefully considered limits.

ments inside of modern vacuum tubes are close together, and they, in conjunction with the wires leading from them to the I tube and presumably in accordance with

contact pins in the base of the tube, constitute what are known as electrical capacities. In other words, there are miniature condensers formed by the filament, grid and plate, the capacities of such condensers residing inside of the tube. It is a fact that in many highly efficient circuits these internal tube capacities definitely influence the electrical behavior of the set. Receivers which are "neutralized" or "balanced" against tendency toward oscillation (howling) are necessarily so balanced for a particular tube. If the internal capacity of tubes varies too far receivers which would otherwise properly function will begin to produce uncontrollable noises, generally of a buzzing or whistling nature, whereupon the musical enjoyment of the audience is destroyed. Consequently, a watch has to be kept by the test laboratories of the tube manufacturer on the internal capacity of high quality

Inside of the vacumm tube is a glowing element called the filament. It is a sort of reservoir from which streams a current of electricity in the form of a myriad of tiny electrical charges called electrons. These pass from the filament to the plate inside of the tube and their flow is definitely controlled by the grid element between the filament and the plate, which acts as a sort of electric valve, turning on and off the flow of current through the

the shape of the sound originally produced in the broadcast studio. This, in general terms, is the process whereby the original signal is reproduced in the home. It is clear that an essential portion of this process is the emission of a sufficiently copious stream of electrons from the filament. If the stream is reduced to a mere trickle the signals will become weak and distorted. In this case, even for a low volume of sound in the home, there will be rattles and distortions in tone quality. Only by careful choice of filament material and a thoroughly correct process of manufacture and testing has it been found possible to produce filaments which not only have a sufficient electron emission when new but which maintain their efficiency during a long, useful life. It may be added that it is particularly difficult to produce such satisfactory filaments when great economy in the amount of power required to heat the filament is imperative, as, for example, in the case of dry battery tubes. Filament design is accordingly a real factor in tube performance and the production of musical quality.

Vacuum tubes used as amplifiers require a high vacuum. Unusual and apparently extravagant precautions must be taken to extract gases from the bulb and even from the metallic elements inside the tube and the very glass itself. The pres

(Continued on next page)

### Some of the Educational and Utilitarian Uses of Broadcasting

If Commercial Stations Are To Be Devoted Primarily to Advertising, They Must Carry a Certain Amount of Entertainment Features

By C. W. Warburton, Director of Extension Work, U. S. Department of Agriculture HIS is Station KSAC, the College of the Air, Kansas State Science Service, an adjunct of the National Research Council for Agricultural College at Manhattan." This is the announce- National Research Council, for ment for which hundreds of folks all over the central United broadcasting by one of the radio States are listening at 7:30 o'clock each evening from Monday to Fri- stations at Washington. These talks day, when the Kansas State College broadcasts its regular course of are prepared by eminent scientists educational lectures. Similarly, other educational institutions are ex- and constitute a definite effort to tending their fields beyond the college campus. The Kansas college, however, was one of the first to recognize the educational value of radio

From the beginning of the school | ing regular courses of instruction

These radio lectures constitute sort of glorified correspondence in. At the end of the course an extions definite credit toward a colcompletion of radio courses.

radio courses presented by the Kansas State Agricultural College, because this institution was one of the

Secretary of Public Education.

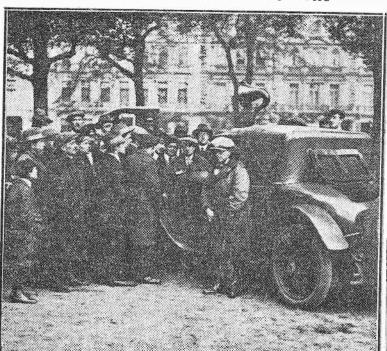
hear the voice and thus have, in a one of the first public uses which was the teacher which heretofore has been sending out of weather reports and limited to the classroom. After each storm warnings by the United States lecture is given, mimeographed copies. Weather Bureau. A little later the

1925-'25 includes 1,771 "individuals United States Department of Agrithese individuals reside in Kansas or radio broadcasts from Philadelphia half hour of popular hymns. nearby states, the far-flung possi- stations, which tell the housewife bilities of radio are demonstrated by just what food products are on the the fact that there were registrants local market in quantity or in spefrom more than thirty states, from cially good quality. Coupled with several of the provinces of Canada, this is usually a brief talk by a home and from Mexico. The growing popu- economics expert on how to utilize Parity of the courses is indicated by most satisfactorily the articles of wious year, while the average number the consumer, in helping him to buy of courses for which each individual and utilize food products most ad-I have gone thus fully into the serves the producer by tending to prevent market gluts and consequent ruinously low prices.

Programs in Farm Areas

pioneers in the field and its faculty Many of the commercial broadcastis exceedingly enthusiastic about its ing stations which are devoted pripossibilities. Kansas State Univer marily to entertainment features inlege and Oregon Agricultural College stations which serve the more imare other institutions which are giv- portant agricultural areas. They have

British Use Radio to Receive News



During the general strike in Great Britain the government broadcast news at regular intervals through the stations of the British Broadcasting Company. This picture shows a wireless-equipped motor car giving out news to the volunteer food transporters in Hyde Park.

weather and market reports, talks or a wide variety of agricultural subjects. These are contributed by mem bers of the staffs of agricultural col-

leges or by the farm press and by A feature of many broadcast programs, particularly during the morning hours, is a talk to housewives.

A striking example of the educational use of the radio is the fifteenminute popular talks on scientific subjects which are arranged by hand is at all conclusive. present scientfic facts to the public in an interesting and entertaining

To be most effective radio lectures year in September until late in the over the radio. An interesting feat-should be combined with mimeoof lectures is broadcast to hundreds these institutions is the half hour of which are mailed to the listeners, toof listeners who are registered for opening exercises which they are gether with such additional tabular lived in queenly serenity as director knobs on the gas stove, is all for these courses. In addition to those broadcasting for schools. The State and illustrative material as may be of her own household, forcing John simplicity, who are registered, correspondence University of Iowa broadcasts open- desirable. Some institutions broad- to take off his wet rubbers in the livestock production, dairying, poul- states plans are under way for broad- tures at the end of the course, to- ful bird houses stuffed with wire. That be a compromise. try raising, foods and nutrition, casting messages to schools by the gether with answers to questions she failed to revolt against this sudhousehold economics, English, chem- state departments of public instruct which have come in from listeners. den and unadvertised usurpation of in the metropolitan districts of the istry, botany, zoology and the several tion. One of the broadcasting sta- It is manifestly impossible, however, her rights might have given a hint country it is plain that the eliminations in Mexico is operated by the to register or to send the printed text to the psychologists, but apparently tion of dials can never be brought to to the great majority of those who it did not. Her acquiescence was the point where individual tuning of hear the lectures. It is equally im- taken for granted. It was something critical circuits is abolished. But it possible to measure the benefits unexplainable, perhaps-as unusual The utilitarian and educational use which will result in a more broadly an occurrence as a solar eclipse—but verniers, rheostats and other herithe course have the opportunity to of radio is not a new thing. In fact, educated people and one which is better satisfied with its home life, vital economies of a B battery. Radio of radio will have to go.

with such additional tabular and il- same means of giving wide and finding the radio of particular value static through the earphones. hastrative matter as may be desirable, prompt distribution to market re- in reaching rural people its adare mailed to the registered listeners- ports was utilized by the Federal vantages in an educational way are Department of Agriculture. Now the not by any means limited to this lege degree is given for satisfactory are maintained by educational insti- broadcasts courses in education, ap-An interesting and useful type of ology, journalism, political science, market reports has been worked out bottny and zoology. He sees great Registration for the radio courses by the Pennsylvania State Depart- possibilities for broadcasting in other given by the Kansas State Agricul- ment of Markets and the Fruit and fields, such as appreciation of music, tural College during the college year Vegetable Marketing Division of the popular astronomy, economics and registered for a total of 11,431 culture. This is a consumer's news most popular features of the program courses. While the major portion of service, which consists of frequent from this station is a Sunday evening

What is the future of educational broadcasting? The educational use of the radio is so new that, like other the fact that the total registration food discussed in the market broad- zines appeal to different groups of was nearly double that of the pre- cast. This kind of information serves people according to the character of reading matter they print, so ecah radio station is likely, it seems to me, registered increased from 2.5 to 6.8. vantageously, and at the same time to build up a following according to

Like the magazines, most stations will have to depend largely on advertising for their support, though this advertising may be so carefully and completely sugar-coated as not to be sity, the State University of Iowa, Indicate University of Iowa, Iowa State College, Ohio State University, Michigan Agricultural College and Oregon Agricultural College stations which serve the most of the state University of Iowa, Indicate the case of the casual of such sets was undoubtedly an important factor. But still it cannot be credited with the entire responsition of such sets was undoubtedly an important factor. But still it cannot be credited with the entire responsition of such sets was undoubtedly an important factor. But still it cannot be credited with the entire responsition of such sets was undoubtedly an important factor. But still it cannot be credited with the entire responsition of such sets was undoubtedly an important factor. But still it cannot be credited with the entire responsition of such sets was undoubtedly an important factor. But still it cannot be credited with the entire responsition of such sets was undoubtedly an important factor. But still it cannot be credited with the entire responsition of such sets was undoubtedly an important factor. But still it cannot be credited with the entire responsition of such sets was undoubtedly an important factor. But still it cannot be credited with the entire responsition of such sets was undoubtedly an important factor. But still it cannot be credited with the entire responsition of such sets was undoubtedly an important factor. But still it cannot be credited with the entire responsition of such sets was undoubtedly an important factor. But still it cannot be credited with the entire responsition of such sets was undoubtedly an important factor. But still it cannot be credited with the entire responsition of such sets was undoubtedly an important factor. But still it cannot be credited with the entire responsition of such sets was undoubtedly an important factor. But still it cannot be credited with the entire responsition of such sets was undoubtedly an important factor. But still it cannot be credited with the entire responsition of su recognized as such by the casual ly overlooked. The panel simplicity

If certain commercial stations of features in such programs, however, are likely to be more or less casual and incidental. The expense of proition with advertising and entertain-

ment are likely to cause them to rehas had much to do with broadcast- And so it has come about. There No. 57, Le Manse, Antwerp, Belgium; ing from one of these colleges, "Any has been much talk in technical maga." Bordeaux, France; Best, Paris and information which is of value to any zines of recent date concerning two- Nondon, England. group of people, wherever located, can dial control of sets-and even of be given to them by radio at very single dial control-although en- Terms HaveDifferent Meanings partial solution to the problem of stay-at-home gypsy, is more inter- the whole pick-up system, including overerowded class-rooms in our col- ested in efficiency than simplicity, at rial, lead-in and ground or coun-

# in their programs, in addition to Women Should Receive Credit For Changes in Radio Design

successful farmers and rural leaders. Man May Take All the Honors for the Development of Our Present Sets, but His Wife Knows Where Responsibility Rests

> By J. K. Smith, Stewart Warner Corporation

ing is something concerning which no data is yet available. Much has been written about this interesting and important subject, but nothing so far deduced from the meager information at

As in most purely technical developments in the United States. woman was given little thought in the early days of radio. Her wishes, which might have been consulted in the purchase of a phonograph or the renting of a house were entirely ignored when husbands only refollowing spring, a regular schedule ure of the programs of several of graphed or printed copies of the text, bazaars that called themselves radio stores

measure, the personal contact with made of radio broadcasting was the whether in the city or in the country. was peculiarly a man's affair, and her part in its popularization was to it perfectly still and speak only in

It was inconceivable, however, that amination is given and those who broadcasting of weather reports is a class of institutions or to farm homes. woman would sit long in dumb comshow evidences of proficiency are regular feature of the program of The program manager of the broad- placency while this new arrival was ment for this year seems likely to given a certificate. In some institu- many of the commercial broadcasting casting station of one of the state being put through its paces. During produce an arrangement already stations, as well as of those which universities tells me that his station the day, while John was down town found effective by a number of preciation of literature, history, soci- the new Whoosis Variometer that an oscillation control and a single would make his set so much more rheostat for all tubes. sensitive and selective, she discovered The modern set is highly sensitive that she could listen in on cooking and does its work with laboratory school talks and noon-day concerts. precision. It is housed in cabinet She began to resent the hours of work that insures it a place in the government. Incidently one of the silence in her household every eve- living room. And it is easily tuned. ning; not only because John was Man may take all the credit for the present but not voting, but also be- development. It is like him to feel

So she spoke her mind and the table darning socks or reading a loudspeaker took its place alongside motion picture review while a jazz the storage battery as an important orchestra 500 miles away renders-an item in the great American scheme appropriate anthem, knows where

ever since, for, unfortunately, when the jig saw puzzles that sired it. John took the earmuffs off his ears, And if she is not yet satisfied, then he was no longer isolated from con- radio is due for a considerable change. versation and he was forced to hear

The reason for the popularity of bated, but in the debate one impor- on the radio by means of station tant cause seems to have been entirefunction.

#### Parts Eliminated

main a comparatively minor factor. elimination of switchpoints, levers, of the banner police bands of the On the other hand, radio broadcast- excess binding posts, vernier knobs country. The Jersey City Kiwanis ing has greatly widened the field of and the like. In his basic psy- Club, represented by a double quartet, the colleges and universities. They chology every man thinks he is a born will then take the air. Musical renhave ready at hand a large number of mechanic. On the other hand, every ditions by the police band will follow experts who can provide educational woman knows she isn't. Woman felt and after this will come a treat par programs at comparatively little something of a panic in looking at excellence—the Jersey City Police added expense. Those who have had the funny controls on John's set. It Quartet, a group which was organized most experience in broadcasting edu- seemed to her a mystery that never during the great World War, having cational material are most emphatic would be solved or worth the solving. served near the battlefront, giving in their statements that the radio Some day, she knew, radio sets would the benefits of their musical talents, constitutes the greatest medium yet be made with no more controls than and having functioned at Le Havre devised for reaching the public. As a gas stove, at which time she could area, sung at the Champ Elysees was recently stated to me by one who begin to look upon radio as her own. Theater in Paris, the Base Hospital

Woman with her recollection of the te poise.

received at the college indicates that ing exercises for high schools, which several times as many listen in more are received by some 200 of these the lectures to those who are regu- he so far forgot himself as to spill long as two such widely differing or less regularly on the educational schools. The Kansas State Agricultalks. The lectures cover a wide tural College broadcasts exercises for soon as each lecture is completed. found her living room invaded by live in the same household, the variety of topics, such as crop and rural schools, and in one or two Others send summaries of the lectures of the lectures and unbeautices implified radio set of the future will

tages from the early Egyptian period

Women are not to be fooled by any While the agricultural colleges are whispers while John tried to hear elimination of controls which consists merely in the substitution of a knob for a dial. Nor are they to be lured by single dial controls augworking for money to squander on manufacturers—three principal dials,

the responsibility rests. Without her She has been speaking her mind radio might still be classified with

the plaints that a few months ago he Oratorical and Musical Talent, night have ignored with good grace. Of Jersey City on Air at WOR five-tube sets has been widely de- musical talent is to be demonstrated

When radio was younger a one-tube Robert J. Hoos, after a short address, If certain commercial stations of the future are to be devoted primarily to advertising, they must carry a certain proportion of educational and entertainment features to maintain their following. Educational the more closely his set resembled a City, John J. Beggans, who, in turn, sioner of Public Safety of Jersey will introduce the Jersey City Police Band, a highly trained musical organization of forty pieces, who have It was woman who demanded the for many years been considered one

slight cost." The radio is the only gineers admit that such devices must. Although the two terms are used agency which can go into every home in their very nature be less efficient freely as synonyms, "aerial" and "anover a wide area and seek those who than sets where radio-frequency cir-tenna" do not mean the same thing. are specially interested in the mes- cuits are individually tuned. Man, The "aerial" is really only the exsage it carries. Here, perhaps, is a who is by nature a "DX-hound," a posed wire, while the "antenna" is

# Additional Radio Programs for the Week

(Continued from preceding page)

1040—WLWL—NEW YORK—288m

8:30 p. m.—McEnery's Entertainers.
9 p. m.—Question box,
9:30 p. m.—Manuel Compinsky, violinist;
Alec Compinsky, cellist.
10 p. m.—"Books," Walter Gavigan.
10:15 p. m.—Grace Stevenson, harpist.
10:25 p. m.—Carlton Boxill, tenor.

14:104—WNSC:—NEW YORK—2:10m 1410k-WMSG-NEW, YORK-210m 1410k.—W. MNG.—NEW. 10kk.—2.0m 6 p. m.—Jimmy Clark's Entertainers. 6:30 p. m.—Hotsey Totsey Boys. 7 p. m.—Sport talk. 7:15 p. m.—Dance Orchestra. 8 p. m.—Fight description from Madison Square Garden. 10:30 p. m.—S. S. Leviathan Orchestra. 7 p. m.—Knickerbocker Trio.
8 p. m.—Blue Bird Novelty Orchestra.
8:30 p. m.—J. Vincent Moore, songs.
8:45 p. m.—Blue Bird Orchestra.
9 p. m.—Milton Yokeman. tenor.
9:15 p. m.—Al Wilson, songs.
9:45 p. m.—Silver voiced tenor.
10 p. m.—Loretta Reynolds, soprano.
10:15 p. m.—Bob Brandes.
10:30 p. m.—Orchestra.

p. m.—News bulletin.

1190k—WNJ—NEWARK—252m
p. m.—Larry Alpern, violinist.
p. m.—Gustav Bischoff, pianist.
m.—Waily Roman's Orchestra.
m.—Market reports; scores.
p. m.—Hanson & Howard, duets.
p. m.—Harriet May, soprano.
p. m.—Criterion Tric.

7:40 p. m.—Criterion Trio.
8 p m.—Stern's Ritz organ.
1190k.—WGCP.—NEWARK.—252m
8:30 p. m.—Walt Riggin's Orchestra.
9:30 p. m.—Frederick Stalger, talk.
9:45 p. m.—Winifred Brown, soprano.
10 p. m.—Hugo Walbel, planist.
10:15 p. m.—Harold Polk, barytone.
1140k.—WAAM.—NEWARK.—263m

11 a. m.—Happy Hour program. 6 p. m.—Ernie Krickett's artists.

m.—Sports talk, Major Tate 1340k—WODA—PATERSON—

1340k—WODA—PATEKSUN—667EM
12 noon—Dance music; songs.
5 p. m.—Studio program.
5.30 p. m.—News; sport talk.
6 p. m.—Colonial Dance Orchestra.
8:15 p. m.—Midweek devotional service.
9 p. m.—Horizontal Warpers.
9:05 p. m.—Imperial Instrumental Trio.
9:15 p. m.—Walt Green, bass.

9:15 p. m.—Walt Green, bass. 6:25 p. m.—Peggy Renne, soprano. 9:35 p. m.—Jack Digman, songs. 9:45 p. m.—Josephine Velluta, soprano. 9:55 p. m.—Sarah Digman, pianist. 10 p. m.—Perkins and Reene, harmonicas. 10:10 p. m.—William Green, tenor. 10:20 p. m.—Durkin and Hunt, comedy skit.

skit.
10:25 p. m.—Mayne Durkin, pianist.
10:30 p. m.—Bill Walsh's Orchestra.
11:30 p. m.—Jimmy Murphy's Owls.
1a. m.—Silk City Rendezyous.
1390k—WRST—BAY SHORE—216m

8-10 p. m.—Fred Baumaster, guitar and harmonica; Billy Sternau, piano.
760k—WLIT—PHILADELPHIA—395m

Orchestra.

2p. m.—Arcadia Concert Orchestra.

7:30 p. m.—Dream Daddy.

590k—WIP—PHILADELPHIA—508m

3:00 p. m.—Dinner music.
7:00 p. m.—Dinner music.
7:00 p. m.—Roll call; songs.
8:30 p. m.—Graduation exercises of th
Combs Conservatory of Music.
10:05 p. m.—Na\* Martin's Orchestra.
760k—WFI—PHILADELPHIA—395m

1:00 p. m.—Tearoom ensemble. 3:00 p. m.—Instrumental quartet; gar den talk; soloists. 6:30 p. m.—Concert orchestra.

son. 8:15-11 p. m.—Program same as WEAF. 1080k—WCAU—PHILADELPHIA—278m

1080k-WCAT-PHILADELPHIA-278m 6:30 p. m.-Billy Hay's Orchestra. 7:30 p. m.-Snellenburg Symphony Or-

den talk; solder 6:30 p. m.—Concert orchestra. 7:15 p. m.—Feature. 8:00 p. m.—"Good Books," Thomas Ma

(Continued from preceding page)

1070k-WNAC-BOSTON-280m 10:30 a. m.-Women's Club talks; songs; news.

1 p. m.—Luncheon concert.

3:10 p. m.—Braves vs. New York Giants.

6 p. m.—The Smilers.

6:30 p. m.—Sam Blum's Orchestra. p. m.—Sam Blum's Orchestra.
m.—Dinner dance.
p. m.—Talk.
p. m.—The Golf Question Box.
m.—Varied program.
m.—Musical program.
or. m.—Crescent Garden's Orchestra 880k—WMCA—NEW YORK—341m
10:15 a. m.—Employment opportunities.
10:30 a. m.—Market reports (hourly to 3:30 p. m.)
12:30 p. m.)
12:30 p. m.—Olcott Vail's String En-10 p. m.—Crescent Garden's Orchestr 860k—WERI-BOSTON—349m 12 m.—Keith's Radio Review, 2 p. m.—Earl Cummings' Orchestra, 4 p. m.—Eugenes Singing Orchestra, 5:45 p. m.—Stoc, market; news, 5 p. m.—Keith's Radio Review. semble.

1 p. m.—Department of Agriculture.

4:30 p. m.—Happy Girl.

4:45 p. m.—Lost and found departments.

6:45 p. m.—Employment opportunities. 5:10 p. m.—Everts of the day. 3:45 p. m.—Big Brother Club. 1:30 p. m.—Musicale. 3-11 p. m.—Program from WEAF. 900k—WBZ—SPRINGFIELD—333m 40 p. m.—Bascoall' results. 45 p. m.—"Mental and Physical Health."

980k-WJAR-PROVIDENCE-306m

semble.

1 p. m.—Department of Agriculture.

4:30 p. m.—Leappy Girl.

4:45 p. m.—Lost and found department.

5:45 p. m.—Employment opportunities.

6 p. m.—Clocott Vail's Ensemble.

6:30 p. m.—Employment Opportunities.

6:32 p. m.—Employment Opportunities.

6:42 p. m.—Musical program.

7 p. m.—Hofbrau Haus Entertainers.

7:30 p. m.—Klein's Serenading Shoemakers.

8 p. m.—Golow Soloists.

9 p. m.—Golow Soloists.

9 p. m.—Columbia Park Entertainers.

10 p. m.—Coughlan Entertainers.

10:30 p. m.—California Ramblers.

11 p. m.—Ernie Golden's Orchestra.

12 midnight—Broadway Night.

11606—WRNY—NEW YORK—258m

12 noon—Studio artist. Health."

8 p. m.—Candlelight concert.

9:15 p. m.—Organ recital.

10 p. m.—Ida Lyans, soprano.

10:15 p. m.—William L. Flood, barytone.

10:30 p. m.—Corinne Ott, soprano, and assisting solois's. 1129k-WTAG-WORCESTER-268m 12 noon—Studio artist. 12:15 p. m.—Ralph Christman, pianist. 12:30 p. m.—Frankie Peper, soprano. 12:45 p. m.—Harper's Magazine, book i 5:15 p. m.—"Story Teller. 7:30 p. m.—WTA() Song Lady. 7:45 p. m.—"How the Golden Rule Fund

2.23 p. m.—Harper s Magazine, book reviews.
6:45 p. m.—Chick Winter's Orchestra.
7 p. m.—Sport rays.
7:10 p. m.—Commercial digest.
7:30 p. m.—Catholic Circle.
7:45 p. m.—Ben Bernie's Orchestra.
8:30 p. m.—Studio musical program.
9 p. m.—Pauline Watson, violinist.
9:15 p. m.—Lorna Lea, Love Song Girl.
9:30 p. m.—Lanceliotti's Song Series.
10 p. m.—Volga Trio, Around the World in Music. is Spent."
8 p. m.—"Good Books," Thomas Masson.
8 p. m.—Travel talk.
9-11 p. m.—Program from WEAF. 640k-WRC-WASHINGTON-469m 640k—WKC--WASHINGTON--169m

1 p. m.—Organ recital.

2 p. m.—Mayflower Orchestra.

8 p. m.—Radio Movie presentation.

8:30 p. m.—United States Marine Band.

10 p. m.—The Royal Saion Orchestra.

11 p. m.—To be announced.

11:30 p. m.—Meyer Davis's L Paradis

Band. 1290k—WOKO—NEW YORK—233m p. m.—Martin Muller, harp-zither, 15 p. m.—Jack McAllister, ukulele, 35 p. m.—Helen Parisi, soprano.

Band.
1220k—WBAL—BALTIMORE—246m
7:30 p. m.—Dinner program.
8:30 p. m.—WBAL Sandman Circle.
9-11 p. m.—Musical program by artists.
11 p. m.—WBAL Ensemble. 1100k-WBBR-STATEN ISLAND-2731 8 p. m.—Watchtower Trio.
8:10 p. m.—Watchtower Trio.
8:20 p. m.—Bible lecture, R. S. Seklemis
8:40 p. m.—Watter Stoll, tenor.
8:50 p. m.—Watchtower Trio. 970k-KDKA-PITTSBURGH-461m 30 p. m.—Dinner concert. o p. m.—"Stockman-Farmer" news.
9:15 p. m.—Farm program.
9:30 p. m.—Half Hours With Famous Composers; KDKA Little Symphony Orchestra.
10 p. m.—KDKA Little Symphony Orchestra. "Stockman-Farmer" news. 950k—WAHG—RICHMOND HILL—316m 12 noon—Grebe Matinee Trio. 12 neon—Grebe Matinee Trio.

740k—WOR—NEWARK—405m
6:45 7:15, 7:45 a. m.—Gym Class.
2:30 p. m.—Le Roy Montesanto, tenor.
2:45 p. m.—The Dandie Dinmont."
3 p. m.—Le Roy Montesanto, tenor.
3:15 p. m.—Francesca Cuce, soprano, an Illuminato Miserandino, violinist.
3:45 p. m.—Edward Breck, planist.
6:15 p. m.—Bill Wathey, "Sports."
6:30 p. m.—Jacques Jacobs's Ensemble.
7:20 p. m.—News bulletin. 1:05 p. m.—Concert from Post Studio. 6:30 p. m.—Concert from Post Studio. 6:30 p. m.—Dinner concert. 7:30 p. m.—Address. 8 p. m.—Concert. 8:15-11 p. m.—Program same as WEAF.

#### FRIDAY

610k-WEAF-NEW YORK-492m 45, 7 and 7:20 a. m.—Health Exercises 45 a. m.—Prayer Services. 11 a. m.—Music.
11:15 a. m.—"Electrical Refrigerator,"
Mrs. E. Earle.
11:30 a. m.—Music.
11:40 a. m.—"The Home Maker in Busi-

11:40 a. m.—"The Home Maker in ness,

12 m.—Market and weather reports.

4 p. m.—Parnassus String Trio.

4:30 p. m.—William Oliver, reader.

4:45 p. m.—Mabel Murphy, soprano.

5 p. m.—Musical program.

6 p. m.—Dinner music.

6:55 p. m.—Scores.

7 p. m.—Dart's Orchestra.

7:30 p. m.—"Kinney Club Stc Blanche Wade.

7:45 p. m.—Dickens Corner. Story.

7:45 p. m.— Namey
7:45 p. m.—Dickens Corner,
8 p. m.—'The Happiness Boys."
8:30 p. m.—Fauline Sternlicht, pianist.
8:45 p. m.—William Lawlor, barytone.
9 p. m.—'The Sorcerer,'' the WEAF
Light Opera Company.
10 p. m.—'Whittall Anglo-Persians."
10:30 p. m.—Ben Bernies Orchestra.
11-12 p. m.—Pelham Heath Orchestra. 660k-WJZ-NEW YORK-455m

p. m.—Ambassador Trio.
p. m.—Weather; news service.
30, 5:30, 7:30, 10:30 p. m.—News service. ice.
4. 4:35, 7:30 p. m.—Baseball reports.
4 p. m.—"Your Daily Menu."
4:15 p. m.—"They Are Wearing."
4:25 p. m.—"Solving-Candy Problems."
4:35 p. m.—Astor Tea Music.
5:32 p. m.—Market Quotations.
5:35 p. m.—Financial Summary.

5:30 p. m.—Financial summary.
5:40 p. m.—Cotton Quotations.
5:50 p. m.—Farm Market Reports.
7 p. m.—George Olsen's Orchestra.
8 p. m.—Sundial Shoe Serenaders, Bonnie Laddies.
9 p. m.—Shider's Hour. 12:20 p. m.—Religious service. 12:35 p. m.—Benjamin Franklin Concert 0:30 p. m.—Lorraine Grill Orchestra

1250k—WHAP—NEW YORK—240m 30 p. m.—Holmes String Ensemble. 10 p. m.—Mary Pinney, planist. 25 p. m.—Kitty Cheatham. 7:55 p. m.—News digest. 8:15 p. m.—Philharmonic Woodwind En-

m.-Franklin Ford, "Public ver-50 p. m.—WHAP Mixed Quartet. 1:10 p. m.—Ernest Wagner, flutist; Dorothy Hoyle, violinist; Vida Mil-holland, soprano; Lucile Wilkin, pian-ist; Ruth Montgomery, soprano. 1430k-WBNY-NEW YORK-210m

ı. m.—Clifton's Anglers. 8:30 p. m.—Chitton's Anglers.
8:90 p. m.—Josh Saddler's Serenaders.
9:00 p. m.—Barry O'Moore, tenor.
9:30 p. m.—The Musical Chefs.
9:45 p. m.—Professor Doolittle.
10:00 p. m.—Sesquicentennial hour.
11:00 p. m.—Parodians' Orchestra. 00 p. m.—Knickerbocker Trio. 00 p. m.—Clifford Odet's "Drama Re view." 3:15 p. m.—Jack Davis,—baritone. 8:30 p. m.—Jeanne A'Dair, songs. 8:36 p. m.—Martha Kovacks, violinist. 9:00 p. m.—Teddy's Virginians. 9:45 p. m.—Martha Kovacks, violinist. 10:00 p. m.—Teddy's Virginians. 10:30 p. m.—Al Wilson and Gang. 11:30 p. m.—Madrid Revue. 1090k—WHAR—ATLANTIC CITY—275m 2:00 p. m.—Seaside Trio. 7:30 p. m.—"Current Events of the 830k-WHN-NEW YORK-361m 15 p. m.—Elvira Geiger, pianist.
15 p. m.—Dr. Robert Harrison, talk.
30 p. m.—The Harmony Boys.
p. m.—Prince Piotti, songs.

ay."
p. m.—Seaside Trio.
p. m.—Atlantic City Male Quartet
p. m.—Follies Bergere Dance Orchestra. 1000k—WPG—ATLANTIC CITY—300m p. m.—News and sports.
p. m:—Chester Podsiadlo, violinist.
p. m:—Chester Podsiadlo, violinist.
p. m.—The Two Building Composer
p. m.—Uncle Rabert's Pals. 6:15 p. m.—Sports talk. 6:30 p. m.—News flashes. 6:45 p. m.—Organ recital 7:00 p. m.—Dinner music. 7:00 p. m.—Dinner music. 8:30 p. m.—Auction bridge game. 9:00 p. m.—Traymore Concert Orchestra. 10:00 p. m.—Million Dollar Pier Dance 10:30 p. m.—Traymore Grill Dance Or-

:10 p. m.—Belle Osborne, contralto, p. m.—Phil Abrahams's Colonial Aces.
:30 p. m.—Treasureland Neighbors, p. m.—Uncle Robert's chat, 05 p. m.—Uncle Robert's chat, 105 p. m.—Evelyn Laska, soprano, 130 p. m.—Evelyn Laska, soprano, 145 p. m.—Bob Brandes, composer, 55 p. m.—Cliff Jerome, tap dance, p. m.—Loew's Lexington Orchestra, 130 p. m.—Palisades Orchestra, 0 p. m.—Roseland Dance Orchestra, 0 p. m.—Roseland Roof Orchestra, 130 p. m.—Strand Roof Orchestra, 11:00 p. m.-McKnight's Dance Orchestra.

1080k—WHAM—ROCHESTER—278m
4:30 p. m.—Eastman Theater organ.
6 p. m.—Student recital.
7:30 p. m.—Book chat from WGY.
7:45 p. m.—Program from studio of WFBL.
9 p. m.—Baseball scores; market report; weather.

-Organ recital,

8:55 p. m.—Clin Jerom.
9 p. m.—Loew's Lexington Orchestra.
10 p. m.—Roseland Dance Orchestra.
10:30 p. m.—Strand Roof Orchestra.
11:30 p. m.—Barn Club A'abam Orchestra.
11:30 p. m.—Club A'abam Orchestra.
12 midnight—Silvy Slipper Orchestra.

940k-WGR-BUFFALO-319m 950k-WGBS-NEW YORK-316m 6:30 p. m.—Dinner music. 8:00-11:00 p. m.—Program from WEAF. a. m.—Timely talks with Terese. 10 a. m.—Elinor Kelin, soprano. 15 a. m.—Radio gym class; songs. 35 a. m.—United Women's Wea. 1130k-WMAK-BUFFALO-266m

980k—WJAR—PROYIDENCE—306m
1:05 p. m.—Studin program.
7:45 p. m.—Talk.
8 p. m.—Hudson & Ssex Orchestra.
9 p. m.—Cliquot Eskimos.
10 p. m.—Silvert wn Cord Orchestra.
630k—WTIC—HARTFORD—476m
6:30 p. m.—Wroth Minutes in Happyland.
6:50 p. m.—Bond Trio.
8 p. m.—Bond Trio.
8 p. m.—Book reviews, Thomas Masson.
8 p. m.—Book reviews, Thomas Masson.
8 p. m.—Concert by 102d Infantry
Band.
1070k—WNAF—ROSTON—280m.
1072k—WNAF—ROSTON—280m.

6 p. m.—Plano lessons; songs.
6 p. m.—Uncle Geebee.
6:30 p. m.—Children's Orchestra of fifty.
6:40 p. m.—Kilbourn Gordon.
6:50 p. m.—Children's Orchestra.
7 p. m.—"What's Your Radio Problem?"
7:10 p. m.—Children's Orchestra.

1410k-WMSG-NEW YORK-210m 6:00 p. m .- Jue Sherman, Jack Niel

6:00 p. m.—Joe Sherman, Jack Niel, songs.
6:30 p. m.—Harry Kirsch.
6:45 p. m.—Halsey K. Mohr, barytone.
7:00 p. m.—Sport talk.
7:15 p. m.—Warren Paul, songs.
8:00 p. m.—Andrew Degnan, ukuiele.
8:15 p. m.—Willard Robison, "The Voice of the South."
8:45 p. m.—Ben Gordon, tenor.
10:00 p. m.—Totman and Wachendorf, banjo and piano.
10:15 p. m.—Carl Smith, tenor.
10:30 p. m.—S. S. Leviathan Orchestra.
1100k—WERJI—NEW VORK—273m Rendrick. 8:15 p. m.—Enrico Aresoni, tenor. 8:30 p. m.—The Singing Groundhog. 8:45 p. m.—Dwight Strickland, "Poetic-ian." jan."

9 p. m.—The Reginas.

9:15 p. m.—Nasco Jolly Four.

9:45 p. m.—Makula's Gypsy Orchestra.

10 p. m.—Harmony songs.

10:30 p. m.—Myers's Musical Architects. 1100k-WEBJ-NEW YORK-273m

7 p. m.—Blenheim Theater Ensemble.
7:30 p. m.—Luna's Marine Band.
8 p. m.—Kathryn Connolly, soprano.
8:10 p. m.—Jack Mahoney, Ukelele Kid.
8:20 p. m.—William Bisignora, accordion selections.
8:30 p. m.—Luna's Knickerbocker Orchestra. 590k—WOO—PHILADELPHIA—508m 11:00 a. m.—Grand organ. 4:45 p. m.—Grand organ; trumpets. 7:30 p. m.—"Kinney Club Story." 880k-WMCA-NEW YORK-341m 10:15 a. m.—Employment opportunities. 10:30 a. m.—Market reports (hourly to 3:30 p. m.). 12:15 p. m.—Department of Agriculture 12:30 p. m.—Olcott Vail's String Ensem-ble

ble.
4 p. m.—Theo Alban, tenor.
4 15 p. m.—Lost and Found Department.
5:45 p. m.—Employment opportunities.
6 p. m.—Olcott Vail's String Ensemble.
6:30 p. m.—Ernie Golden's Orchestra.
7 p. m.—Talk. H. L. Stratton.
7:05 p. m.—Employment opportunities. 6:30 p. m.—Ernie Golden's Orchestra.
7 p. m.—Talk. H. L. Stratton.
7:05 p. m.—Employment opportunities.
7:10 p. m.—Ernie Golden's Orchestra.
7:30 p. m.—Sachs Quality Boys.
8 p. m.—Woodmanston Inn Orchestra.
8:40 p. m.—Edward French, pianist.
8:50 p. m.—Broadway Association.
9 p. m.—Hardman hour of music.
10 p. m.—Musical program.
10:15 p. m.—Coughlan announcement.
10:20 p. m.—McAlpin news editor.
10:30 p. m.—Musical program.
12 midnight—McAlpin Entertainers.
570k—WNYC—NEW YORK—526m

570k—WNYC—NEW YORK—526m 5:30 p. m.—Herman Neuman, planist. 5:40 p. m.—Market high spots. 5:50 p. m.—Plano selections.

5:50 p. m.—Flano selections.
6 p. m.—Elementary French lessons.
6 p. m.—Elementary French lessons.
7 p. m.—Miron Polyakin, violinist and assisting artists.
7:35 p. m.—Police alarms.
7:35 p. m.—Miron Polyakin's Artists.
8 p. m.—Baseball results.
8:05 p. m.—Selma Slotkin, plano recital.
8:30 p. m.—German lieder program: Gertrude Clauss, soprano; George Gut, tenor; Martha Reske, soprano; Willy Reske, barytone.
9 p. m.—Lecture by Dr. Frank Vizetelly.
9:20 p. m.—Sidonie Lieban, soprano.
9:40 p. m.—Leon Glasser, violinist.
10:10 p. m.—Dramatic reading, Hariette Weems.
10:30 p. m.—Police alarms; weather.

Weems. 10:30 p. m.—Police alarms; weather. 1100k-WFBH-NEW YORK-273m 2 p. m.—Orchestra.
3 p. m.—Studio program.
3:45 p. m.—J. Vincent Moore, tenor.
4 p. m.—Nita Nadine, soprano.
4:15 p. m.—Carl Smith, Joe Davis; songs.
4:30 p. m.—Sam Perry, piano recital.
5 p. m.—Miriam Davis, songs.
5:15 p. m.—Murray Schwartz, piano accordeon. cordeon. 5:45 p. m.—Michael Simmons, "movie"

P. Sy. 7:40 p. m.—Musical.

9 p. m.—Musical program.
10 p. m.—Whittall's Anglo-Persians.
11 p. m.—Biltmore Dance Orchestra.

SATURDAY

610k-WEAF-NEW YORK-492m

n.—George Kanony, barytone. p. m.—Talk, Grant Mitchell.

1-12 p. m.—Vincent Lonez's Orchestra.

p. m.-Armand De Cesaro, uke

660k-WJZ-NEW YORK-455m

p. m.—News service. 4:30, 5:30, 7:30 p. m.—Baseball report 30, 5:30, 7:30, 10:30 p. m.—News. 30 p. m.—Lorraine Grill Orchestra.

40 p. m.—Cotton quotations. 50 p. m.—Farm market reports. p. m.—Madison Concert Orchestra. 45 p. m.—Chief Steward Ballyn,

songs.

8 p. m.—Congressional forum.

8:30 p. m.—Chief Steward Ballyn.

8:45 p. m.—U. S. Navy night; U. S. Navy Band.

9:30 p. m.—"The Persian Garden," Radio Mixed Quartet.

11 p. m.—Mayflower Dance Orchestra.

950k-WGBS-NEW YORK-316m

950k—WGBS—NEW YORK—316m
10 a. m.— timely talks with Terese.
10:10 a. m.—Kiddle Klüb program.
10:40 a. m.—Muriel Ellis, readings.
10:50 a. m.—Fashion talk.
1:30 p m.—Scripture realing.
1:35 p. m.—Ely Well, vio'nist.
1:45 p. m.—Radio wave tales.
1:55 p. m.—Thelma Kinstler, planologues.
2:05 p. m.—Violin and pianc seles.
3:4 p. m.—Roxana Erb, contraito; Milton Yokeman, tenor.

Yokeman, tenor. p. m.—Uncle Geebee. 30 p. m.—Vincent Sorey Concert Trio.

:30 p. m.—Lorraine Grill Orch :32 p. m.—Market quotations. :35 p. m.—Financial summary.

chat. 6 p. m.—Katherine Kent, soprano, 6:15 sp. m.—Judge Clarice Baright. 6:30 p. m.—Cupid Dance Orchestra. 11:30 p. m.—Connie's Orchestra. 1160-WRNY-NEW YORK-258m 12 (noon)-Musical Courier says. 12:15 p. m.—Bob McDonald, ukelele.

12:15 p. m.—Bob McDonald, ukelele.
12:30 p. m.—Pauline McDonald, songs.
12:45 p. m.—Edwin J. Caplin, tenor.
7 p. m.—Sport rays.
7:10 p. m.—Commercial Digest.
7:15 p. m.—Radio Theater index.
7:20 p. m.—Marjorie Stuart, songs.
7:30 p. m.—Harry Hirschfield, "Able Kabibble."
7:45 p. m.—Alfred W. McCann. foods. :45 p. m.—Alfred W. McCann, foods. p. m.—Gordon Hampson Opera Com

pany. 8:45 p. m.—"Scientific Problems," J. H Kraus. Kraus.

9 p. m.—Graffman's violin presentation.

9 p. m.—Constantino Ensemble.

10:15 p. m.—Novelty Night—Dante's Inferno—Irvine Players.

ferno—Irvine Players.

950k—WAHG—RICH. HILL—316m

12 (noon)—Musical program.

7:30 p. m.—Lou Drago, ukelele.

7:45 p. m.—Fred Gerrold, barytone.

8 p. m.—Dr. Warren Allen, organist.

9:15 p. m.—Phyllis Newkirk, contralto.

9:15 p. m.—Walter Sellers, tenor.

9:30 p. m.—The Gondullers.

10 p. m.—Al Wilson's Playmates.

10:20 p. m.—Dance orchestra.

1230k-WGBB-FREEPORT-244m 8:45 p. m.—Nettie Seferth, soprano. 9 p. m.—G. B. Comer, basso. 9:15 p. m.—Long Brothers, entertainer 9:30 p. m.—Lesser's Nite Owls. 10:30 p. m.-Eisenhuth's Lynbrooklyns.

7:15 p. m.—Armand De Cesaro, uke. 7:30 p. m.—Jean La Marr, songs. 7:45 p. m.—Armand De Cesaro, uke. 8 p. m.—Horace Taylor, reader. 8:15 p. m.—'Cookie' Cohen, song bird. 8:30 p. m.—Samuel Bernard, timeology. 8:45 p. m.—Prince Piotti. 9 p. m.—'Cookie' Cohen, songs. 9:15 p. m.—Babst Sisters, duets. 9:30 p. m.—Frank Marvin, tenor. 9:45 p. m.—Maurice Leest Trio. 10:30 p. m.—Leviathan Orchestra. 115 p. m.—Philharmonic Woodwind Ensemble.
15 p. m.—Hugh Adams, "Immigration Restriction."

p. m.—Philharmonic Woodwind Ensemble.
1190k—WNJ—NEWARK—252m
5:00 p. m.—Leon Kristel, barytone.
5:15 p. m.—Beatrice Marsh, soprano.
5:15 p. m.—Creighton Allen, pianist
5:45 p. m.—Gertrude Toole, soprano. 6:00 p. m.—Lincoln Highway Inn. 8:30 p. m.—Market reports; scores. 8:35 p. m.—Stern's Tivoti organ. 9:30 p. m.—Dreamland's Memphis Five. 1190k-WGCP-NEWARK-252m 7:00 p. m.—Alice Laurie, soprano. 7:15 p. m.—Blanche Darvo, uke and

7:30 p. m.—Alice Laurié, soprano. 7:45 p. m.-Blanche Darvo, uke and 7:45 p. m.—Silvertone Trio.
50ngs.
8:00 p. m.—Silvertone Trio.
740k—WOR—NEWARK—405m
6:45-7:15-7:45 a. m.—Gym class.
2:30 p. m.—Ralph Leigh. tenor.
2:45 p. m.—Helen Schafmeister, pianis

3 p. m.—Ralph Leigh, tenor. 3:15 p. m.—Marvin Clark's Aces of Harmony. 6:15 p. m.—Bill Wathey, "Sports." 6:30 p. m.—News bulletin. 6:40 p. m.—Bretton Hall String Quarte 1140k—WAAM—NEWARK—263m 10:30 a. m.—Happy Hour program.
11 a. m.—Public Service Cooking School

1 a. m.—Fublic Service Cooking Schop. m.—Tom Cooper's Orchestra.
p. m.—Sport Review, Major Tate.
p. m.—When Human Machine."

15 p. m.—Kocon Instrumental Trio.
30 p. m.—Bob Nellson, Dick Robs.

"Radio Bobs." 10 p. m.—Wallie Osborne's Orchestra. 1340k—WODA—PATERSON—224m 12 (noon)—Dance music.
12:30 p. m.—Concert selections,
5 p. m.—Entertainment. 5 p. m.—Entertainment.
5:30 p. m.—News; sport talk.
6 p. m.—Frankie Pope's music.
8:30 p. m.—Norman Smith, tenor.
9 p. m.—Madison Quartet, sacred music
9:30 p. m.—Prof. William Schlumpf.
9:45 p. m.—Soprano, tenor, contralto
barytone.
10:45 p. m.—Quartet.
11 p. m.—Studio program.
11:30 p. m.—Clifford Lodge frolic.

p. m.—Giuseppe Leone, barytone. 10 p. m.—Sorey Concert Trio. 10 p. m.—William Black "Outline" :45 P. M.—George Hall's Orchestra. ogy. p. m.—Irish hour: Memory of Thomas 10 p. m.—Truth Hall Male Quartet. 10 p. m.—Painter Trio. 10:30 p. m.—Carroll's Dance Orchestra.

1390k—WRST—BAYSHORE—216m p. m.—Jack Watson's Orchestra. p. m.—First Congregational Church organ recital. 1160k—WRNY—NEW YORK—258m 6:45 p. m.—Beatrice Luisi, "Detect Stories." 7 p. m.—Sport rays: commercial digest 6:45 p. m.—Beatrice Luisi, "Detective Stories." Stories."

7 p. m.—Sport rays; commercial digest.

7:15 p m.—Stella Rose, soprano.

7:20 p. m.—Stella Rose, soprano.

7:30 p. m.—Orlando's Concert Orchestra.

8 p. m.—Anna Russo, songs.

8:15 p. m.—Bernie's Orchestra.

9 p. m.—Gluseppe Adami, violinist.

9:15 p. m.—Drawing Room Players,

Charles Dickens.

9:45 p. m.—Isabelle Austin's Musicale.

1 to 2 a. m.—DX Hound hour. 760k-WLIT-PHILADELPHIA-395m 202 p. m.—Organ recital.
2:30 p. m.—Arcadia Concert Orchestra.
p. m.—Arcadia Concert Orchestra.
2:30 p. m.—Playlet.
2:35 p. m.—Arts recital.
2:30 p. m.—Dream Daddy. p. m .-- "Career of a Singer," Henry

Hotz.
8:20 p. m.—Chautauqua Hour.
9:30 p. m.—Schickerling Artists.
10 p. m.—Arcadia Cafe Dance Orchestra.
10:30 p. m.—Rufus and Rastus.
11 p. m.—Freshman Radio Hour.
12 (midnight)—Musical comedy and theatrical all-star program. 1100k-WFBH-NEW YORK-273m 1100k—WFBH—NEW YORK—273m

2 p. m.—Bert Lowe's Entertainers.

2:45 p. m.—Florence Hynes, soprano.

3 p. m.—Studio program.

3:30 p. m.—Marcia James, soprano.

3:45 p. m.—Eddie Woods, songs.

4:15 p. m.—Eddie Woods, songs.

4:15 p. m.—Edd Berlin's Orchestra.

5:15 p. m.—Bob Cavanaugh, Charles Hefferan, banjos.

5:30 p. m.—Orchestra selections.

6 p. m.—Helen Ryan, violinist.

6 p. m.—Helen Ryan, violinist. 590k-WIP-PHILADELPHIA-508m 590k—WIP-PHILADELPHIA—908m
p. m.—Luncheon music.
p. m.—Artist recital.
6:05 p. m.—Dinner music.
6:50 p. m.—Livestock and produce markets.
7 p. m.—Bedtime story; songs.

6 p. m.—Helen Ryan, violinist.
6:15 p. m.—Helen Knopf, pianist.
6:30 p. m.—Davegas golf lesson.
6:45 p. m.—Majestic String Ensemble.
7:15 p. m.—Investment questions.
7:30 p. m.—Henri Pedreira, plano recital. 1080k—WCAU—PHILADELPHIA—278m 880k—WMCA—NSW YORK—341m
10:15 a. m.—Employment opportunities.
10:30 a. m.—Market reports (hourly to 3:30 p. m.).
12 noon—Department of Agriculture.
12:30 p. m.—Olcott Vail's String Engagement. p. m.—Administration of W. Freeland Kendrick.

12:30 p. m.—Olcott Vail's String Ensemble.
5:45 p. m.—Employment opportunities.
6 p. m.—Olcott Vail's String Ensemble.
6:30 p. m.—Talk by H. L. Stratton.
6:32 p. m.—Employment opportunities.
6:40 p. m.—Musical program.
7 p. m.—Tappen's Orchestra.
8 p. m.—Tracy Pearl musical program.
8:30 p. m.—Current events.
9:30 p. m.—Stauch's Orchestra.
10 p. m.—Gughlan Entertainers.
10:30 p. m.—Musical program.
11 p. m.—Ernie Golden's Orchestra.
12 p. m.—McAlpin Entertainers.
570k—WNYC—NEW YORK—526m 570k-WNYC-NEW YORK-526m 6:45 p. m.-Fred Ehrenberg, Musi

7:35 p. m.—Rinney Club Story."
7:45 p. m.—Dance music.
8:00 p. m.—Temple University address.
8:15 p. m.—WOO Orchestra: Henri Elkan, viola; Ruth, Montague, soprano.
9:25 p. m.—Fox Theater studio program.
10:00 p. m.—Organ recital, Mary Vogt.
10:30 p. m.—Dance music. Saw. 7 p. m.—Herman Neuman, pianist. 115 p. m.—Billy King, songs. 130 p. m.—Police alarms. 1135 p. m.—"Books," Professor J. Carter 760k-WFI-PHILADELPHIA-395m Troop.
J:45 p. m.—Dick Hughes, ukelele.
3 p. m.—Baseball results. 8 p. m.—Baseball results.
8:05 p. m.—Max Wechsler, violinist,
8:30 p. m.—Allen Campbell, bass; George
Hefele, tenor; Miss Price, pianist,
9 p. m.—St. George Society Orchestra.
10:30-p. m.—Wayside Troubadours.
10:30-p. m.—Police alarms; weather, 090k-WHAR-ATLANTIC CITY-275m 2 p. m.—Seaside Trio. 7:45 p. m.—"Horticultural Question Box." 8 p. m.—Seaside Trio. 1000k-WPG-ATLANTIC CITY-300m 1:30 p. m.—Luncheon music, tea music. 6:45 p. m.—Organ recital. 7 p. m.—Traymore dinner music. 7:30 p. m.—Eiks Home dinner music. 8 p. m.—William Baxter, "Question Box." 8:15 p. m.—James W. Way, tenor. 8:30 p. m.—Million Dollar Dance Orchestra 1290k-WOKO-NEW YORK-233m 3 p. m.—Consuelo Rivero, pianist. 3:15 p. m.—Augustin Gonzalez, barytone. 3:35 p. m.—Jack Goll, pianist. 3:50 p. m.—Carl Smith, tenor. 1:05 p. m.—Jeanne A'Dair, songster. 3:20 p. m.—Milton Yokeman, tenor.

tra.
) p. m.—Ambassador Concert Orchestra.
) p. m.—American Legion program.
10:30 p. m.—Organ recital. 1100k—WBBR—STATEN ISLAND—273m 3:00 p. m.—Dr. Hans Haag, violinist. 3:20 p. m.—Bible questions and answers. 8:45 p. m.—L. Marlon Brown, soprano. 950k—WAHG—RICH. HILL—316m

12 (noon)—Musical program.
12:30 p. m.—International Trio.
1:02 p. m.—Ralph DeStefani's Orchestra.
12:00 p. m.—Midnight variety program.

10:30 p. m.—Organ recital.

1080k—WHAM—ROCHESTER—278m
4:30 p. m.—Eastman Theater.
6:00 p. m.—Student recital.
8:15 p. m.—Three-act comedy, "Stray Cats," given by WGY Players.
10:30 p. m.—Program by Babcock Lake Orchestra.
11:45 p. m.—Dance program. 1140k—WAAM—NEWARK—263m 6:00 p. m.—Phil Lynch's Orchestra; talk, 7:00 p. m.—Sport talk, Major Tate. 7:15 p. m.—Harold Polk, barytone. 940k—WGR—BUFFALO—319m p. m.—Concert program. p. m.—Blanche Elizabeth Wade. 7:10 p. m.—Haroid Polk, barytone.
7:30 p. m.—Organ recital.
8:00 p. m.—Bertha Bird, soprano.
8:20 p. m.—Band.
8:45 p. m.—'Memorial Day'', talk.
9:00 p. m.—Eand.
9:30 p. m.—East Orange Police Quartet.
10:00 p. m.—Ray Nichols's Orchestra. p. m.—Winger's Entertainers.

1130k—WMAK—BUFFALO—266m 6:30-7:15 p. m.—Dinner music. 7:30-7:40 p. m.—Reading, by Dr. Albert 1340k-WODA-PATERSON-224m 12 (noon)—Dance music.
12:30 p. m.—Popular songs
5:00 p. m.—Musicale.
5:30 p. m.—News; sport talk.
6:00 p. m.—'The American Flag," Henry
Heinrichs. 980k—WJAR—PROVIDENCE—306m 105 p. m.—Howard and Harris. p. m.—Musical program. 130 p. m.—Gorman's Jolly Bakers.

Heinrichs.
740k—WOR—NEWARK—405m
6:45, 7:15, 7:45 a. m.—Gym class.
2:30 p. m.—Dorothy Eisenstadt, soprano.
2:45 p. m.—"Walt Whitman Birthday
Talk," B. P. Adams.
3:00 p. m.—Dorothy Eisenstadt, soprano.
3:15 p. m.—Central Park Casino tea music.
6:15 p. m.—Bill Wathey, "Sports."
6:30 p. m.—Jacques Jacobs's Ensemble.
7:30 p. m.—St. Elizabeth College Glee
Club.
8:00 p. m.—Orange Chamber of Com-

6:45, 7, 7:20 a. m.—Health exercises, 7:45-8 a. m.—Morning prayer services. 3:30 p. m.—Unveiling of the statue of Leif Ericson at Washington; United States Marine and Navy Bands; address by Calvin Coolidge, President of States; introductions by Congressman the United States; introductions by Congressman Carl R. Chindblom; address by Crown Prince of Sweden. 5 p. m.—Musical program. 6 p. m.—Dinner music. 8:55 p. m.—Baseball scores. 7 p. m.—George Kanony, barytone. merce.
8:45 p. m.—Copenhagen Quartet.
9:15 p. m.—LaForge-Berumen musicale.
10:00 p. m.—Bordentown Military Institute Glee Club.
10:30 p. m.—Leon Wood, organ recital.
11:05 p. m.—Leon Wood, organ recital.
11:15 p. m.—Larry Siry's Ambassador Orchestra. 1190k—WGCP—NEWARK—252m 8:30 p. m.—Liewellyn and Browne, songa. 8:45 p. m.—Russian Ensemble, instru-

8:45 p. m.—Russian Ensemble, instrumental.

9 p. m.—Newark Solo Quartet.

9:15 p. m.—Steinbach Trio, instrumental.

9:30 p. m.—Newark Solo Quartet.

9:45 p. m.—Steinbach Trio, instrumental.

10 p. m.—Parkview Orchestra.

10:45 p. m.—Prank Long, barytone.

11 p. m.—Orange Tea Garden Orchestra. p. m.—Musical comedy hits.
p. m.—"The Rivals," by the WEAF
Players.
p. m.—The Buffalodians' Dance Or-11 p. m.—Orange Tea Garden Orchestra.

760k—WLIT—PHULADELPHIA—395m

12:05 p. m.—Organ recital.

2 p. m.—Dickerson's Society Orchestra.

4:35 p. m.—Ten Arcadia Syncopators.

5:50 p. m.—Baseball scores; sports.

7:30 p. m.—Franklin Concert Orchestra. 11-12 p. m.—Vincent Lopez's Orchestra.

1410k—WMGS—NEW YORK—210m
6 p. m.—Carl Smith, Joe Davis.
6:30 p. m.—Billy Tracey, Dougherty, entertainment.
7 p. m.—Sport talk.

590k—WIP—PHILADELPHIA—504
10:30 p. m.—Reducing exercises.
1 p. m.—Organ recital.
3 p. m.—Frank Dolge's Serenaders.
4 p. m.—Solos by Dorothy Latshaw.
6:05 p. m.—Dinner music.
7 p. m.—Bedtime story; songs.
8 n. m.—Snorts Corner. 8:15 p. m.—Artist recital.
9 p. m.—Recital: Fanny Sharfsin, vielinist; Flora Ripka, accompanist,
10:05 p. m.—Dance music.
11:05 p. m.—Organ recital. 11:09 p. m.—Organ recital.
590k—WOO—PHILADELPHIA—508m
11 a. m.—Grand organ.
12. m.—Luncheon music.
1:45 p. m.—Grand organ; trumpets.
1:30 p. m.—Dinner dance music.

p. m.—Tea Room Ensemble. p. m.—Tea Room Ensemble. p. m.—Nesquehoning Male Quartet. 30 p. m.—Rey Dance Orchestra. m .- Concert orchestra p. m.—Dance orchestra.
p. m.—Musical program.
p. m.—Lu Lu Band. 1.090k-WHAR-ATLANTIC C.-275m p. m.—Seaside Trio.

30 p. m.—Lecture period,
p. m.—Seaside Trio.
p. m.—Concert by the American Popular Entertainers.

1,000k-WPG-ATLANTIC CITY-300m 1,000k—WPG—ATLANTIC CITY—300m
6:45 p. m.—Organ recital.
7 p. m.—Morton dinner music.
7:30 p. m.—Elks Home dinner music.
8 p. m.—Ambassador dinner music.
8:30 p. m.—'All Wars'' Memorial Day
program; Lyric Male Quartet.
9:15 p. m.—Traymore Concert Orchestra.
10 p. m.—Dance orchestra.
10:30 p. m.—Elks Home dance orchestra. 1080k—WHAM—ROCHESTER—278m 30 p. m.—Eastman Theater organ p. m.—Eastman Theater organ.

o 10 p. m.—Musical. 980k—WJAR—PROVIDENCE—306m 1:05 p. m.—Zikes Orchestra. 630k—WTIC—HARTFORD—476m

Compact Six-Tube Resistance-Coupled Set

(Continued from page one)

The subpanel holds the six sockets pieces of stiff busbar soldered to them. I dently is plenty high enough to protect along its back section in two rows of The construction work can be carried three each. It is fastened at right angles out most conveniently if the front and to the front panels by means of two shelf subpanels are treated as separate units brackets at a height above the table equal and attached to each other by means of to the width of the binding post strip. the shelf brackets after the respective The strip itself is mounted to the under parts have been mounted on each. Mount side of the subpanel by two small Lthe Bruno coil. Amsco condenser and the shaped brass angles about an inch and other front panel devices first, then lay a half in from the back edge in such a the panel aside and assemble the submanner that it acts as a rear support for nanel fittings. While the two sections are the panel. A small rectangle is cut out thus separated you will be able to install of the center of the front edge of the subcomfortably a good deal of wiring that would require some awkward poking with Betwen the first and second and second the soldering iron if it were attempted and third sockets in the rearmost row are

placed units consisting of one .0005 mfd. The hook-up is simple, each stage being condenser and two resistor mountings. A a repetition of the foregoing one. The single resistor mounting fits along the primary of the Bruno tuner is connected right side of the extreme right socket. directly to the aerial and ground posts, These two receptacles are for the radio while the secondary is bridged by the frequency tubes. Another clip mounting Amsco condenser (rotary plates to filament, stationary to grid) and thence goes along the left side of the extreme left socket of the inner row, the carboracross the grid circuit of the first tube. undum detector between it and the Note, please, the absence of a grid consecond sockets, a double resistor-.006 denser. This is an R. F. amplifying stage mfd. condenser unit between the second and the usual condenser and appended and third, and finally a single resistor leak are not used. mounting next to the third. The remain-

the bulb from blocking, for no trouble whatsoever from this cause is noticeable.

The set works like a charm. As conceded in an earlier paragraph the amplification afforded by each resistance R. F. stage is determined by the tubes themselves. If the circuit comprised straight resistance "coupling" all six tubes probably would not work as well as two in a good reflex, but with nicely controllable regeneration in the first stage the situation is entirely different. As the receiver stands it delivers unblemished signals of more than sufficient power to fill the requirements of the average-sized home.

The regeneration in the first tube not only provides the set with its "kick," but it also supplies it with its selectivity. Without renegeration the circuit tunes quite as broadly as one would expect of a single tuned stage, but with the beneficial action installed it separates the powerful metropolitan broadcasters without difficulty. Hearing is believing.

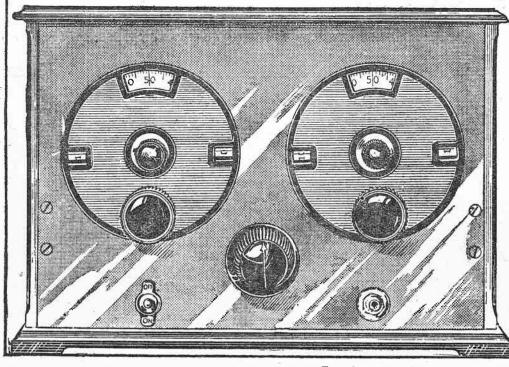
From tube 1 right along the line to line

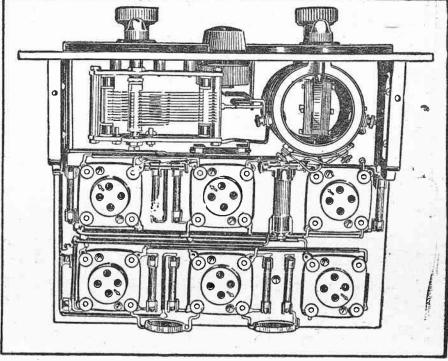
High "MU" Tubes As this outfit is a resistance affair throughout, I suppose I ought to recom-

201-As, they don't seem to work any better than the latter.

[Editor's note-High "MU" tubes having an amplification constant of twenty will produce greater amplification in resistance coupled circuits when the coupling resistances are designed for use with these tubes. However, as the amplification obtainable from a resistance coupled amplifier is determined by the value of the coupling resistance, as compared with the value of the input impedance of the tube, and as most high "MU" tubes have a far greater input impedence than tubes of the UX 201-A type, in most cases the UX 201-A will produce equally satisfactory results. Another characteristic of high "MU" tubes which have an effect on the design of the receiver is that very high plate voltages must be used. Some of these tubes have a plate resistance of about 70,000 ohms and a plate coupling resistance of 140,000 ohms should be used if maximum amplification is desired. It can, therefore, be seen that in order to supply sufficient voltage to the plate of the tube an enormous voltage must be applied to the amplifier in order to overcome the 140,000 ohms coupling resistance.]

The operation of this set is easily mas-





Two drawings of the six-tube receiver described in this article

side of the center receptacle.

in the lower right and the rheostat in the

panel to accommodate the rheostat.

lower center.

#### Mounting the Resistors

If resistor mountings with individual bases are purchased they can be disassembled, the bases discarded and the spring clips themselves then screwed directly to the surface of the subpanel. If this is done the various connecting wires can be lead to the ends of the screws on the under side of the panel and can be kept neatly out of sight. The fixed condensers are not screwed to the subpanel,

ing resistance clip is placed on the panel | to tube 6 the circuit is merely resistances | mend high "mu" tubes for all the stages, | tered, only one of the two dials being and condensers. The one break occurs between the third and fourth bulbs, where the carborundum crystal replaces the coupling condenser.

#### Connection of Crystal

The connection of the crystal between the plate of one tube and the grid of the next appears to be queer, doubly so because the crystal is the only obstacle to the flow of the B current on to the grid of the fourth tube; but that's the way the set is made, and that's the way it works. but are supported in mid-air by the The resistance of the carborundum evi- trast with the eight or nine of the lowly enjoy.

but having found, as a number of my friends have, that the undeniable theoretical advantages of these bulbs for resistance amplifier work do not always manifest themselves in actual practice. I am merely suggesting any good tubes of the 201-A type. I have tried a quantity of the "hi-mu" bulbs in a number of separate resistance amplifiers and was keenly disappointed in not obtaining any better results than it did. Although the tubes are supposed to have amplification constants of twenty or thereabouts, in con-

continuously variable. The condenser is the real tuning control, the tickler of the three-circuit tuner requiring only casual adjustment for all local reception. If the tickler dial is grasped in the left hand and the condenser dial in the right and the two adjusted with care, so that a slight rushing noise is heard in the phones or loud speaker, the set will bring in distant stations quite readily. Its main feature, however, is its beautifully clear reproduction of nearby stations. It is an outfit the music lover will genuinely

# The Vacuum Tube's Contribution to the Quality of Reproduced Music

ence of gas in the tube shortens its life and causes it to be "noisy." Gassy tubes, instead of giving a velvety, silent background when the music stops, or when a soft note is being sung, give a continual hissing or scratching sound which is most distracting and greatly detracts from the otherwise complete enjoyment of a musical program. This subtle factor in tube performance is difficult to measure except in the laboratory, and it is therefore of importance to be sure that highly exhausted tubes are actually being secured by the broadcast listener-tubes which are criticall tested by the manufacturer.

The delicate elements inside of a vacuum tube, if jarred, will vibrate. Some makes of tubes are peculiarly sensitive to mechanical disturbance and easily produce a "ringing note" if the receiving set is touched or tapped. Particularly is this the case if the tube sockets are not effectively cushioned and elastically supported. Vacuum tubes which produce a loud and prolonged ringing note when tapped will not give the same satisfaction as "non-microphonic tubes" which are free from this defect. In any case the vacuum tube mounting should be appro-

Radio has passed out of the stage where one sort of tube is equally desirable in every socket of the receiving set. The day of the "general utility tube" is over. (Continued from preceding page)

tube of the older types for the amplifier | give a higher output than has hitherto portions of the receiver with the imporbeen obtainable in tubes of these respectant exception of the last or output stage. tive classes. By using such tubes con-This is the tube which feeds the loud siderable and natural volumes of sound speaker and it should be a specialized can be secured without distortion on ap-'high output tube." Fortunately, there propriate loud speakers. This meets a have been recently produced very useful long-felt need, because there is a vast dif-

and efficient dry battery, storage battery ference between the listening output of a and power supply operated tubes which tube and the undistorted output. The

### Speakers Not the Only Cause of Distortion

experts too for that matter, to blame all distortion on the loud speaker. The evidences of distortion—the "blasting," "rattling" and "tinniness"—are such as to suggest the reproducing mechanism as the source of the difficulty to any but the more experienced ear. As a matter of fact, the loud speaker is rarely responsible for more than 25 per cent of the strain in the average case of distortion. The amplifier itself generally assumes 50 per cent of the blame, while the tubes are culpable for the remaining 25 per cent.

In only a comparatively few instances will the installation of a new and better speaker eliminate distortion. On the contrary, in many cases a superior talker outputs a more distorted signal than a cies in a horn type speaker, the sudden inpoor one. A poor loud speaker has a clusion of these heretofore missing notes We should still use the general utility | tendency to counteract the distortions oc- | may temporarily seem unnatural.—Z, B,

There is a tendency among fans, and , casioned by an equally inefficient amplifier while a first class reproducer, by virtue of its excellence, gives out in sound an exact counterpart of what you put into it electrically.

It is because of this "straight line characteristic" that many users of cone loud speakers-which are fundamentally superior to the horn type-have been disappointed in the quality of their new speakers.

If, on changing from a horn speaker to good cone, you find the quality unimproved, you have definitely demonstrated the inefficiency of your amplifier. However, do not be deceived by the generally lowered tone of reproduction. To the ear accustomed to the loss of the low frequenlimiting output is merely represented by the maximum amount of noise which the tube can produce, which is certainly a very different thing from the undistorted output or the greatest volume of sound which can be produced while still retaining high quality.

A brief mention of the importance of suitable batteries in good condition in their relation to tone quality is pertinent. When the A or filament batteries of a receiver run too low the tubes will not light up fully and the signals, besides being weak, are frequently distorted or scratchy in quality. A run-down condition of the B or plate batteries similarly causes a noisy or weak signal with distorted quality, or may even give rise to disagreeable howling sounds. The C or grid battery also plays a great part in the production of high quality music. Exhausted C batteries, or C batteries of wrong voltage, will damage the tone quality of the received music by introducing false overtones and will also give rise to rattling. Proper C battery voltages and batteries in good condition are particularly necessary in the last two amplifier tubes of the receiving set.

The best rule is to select reliable tubes. each suited for the particular purpose to which it is to be put in the receiver, and then not overwork these tubes nor to neglect the upkeep of the batteries feed ing the tubes.

# The Herald Tribune Daily Broadcasting Programs for Week Ending May

#### TO-DAY

610k-WEAF-NEW YORK-492m 3-4 p. m.—Interdenominational church serivces; address by the Rev. Rockwell Brank; church choir; soloists, Marie Andrews, Millie Blela, Ernest Burkhardt, Elmer Ross, Robert Weigester.
4-4:30 p. m.—Symphony orchestra.
4:30-5:30 p. m.—Federation Mixed Quartet, with Lotta Madden, Mildred Bryars, Bruce Muir and Arthur Hunt, in musical vegners. vespers. 5:30-.:30 p. m.—Orchestral concert. 6:30-6:50 p. m.—Mathilde Harding, planist. 6:50-7:20 p. m.—Centenary Collegiate In-stitute Girls' Glee Club. 7:20-9:15 p. m.—Capitol Theater Family. 9:15 p. m.—Atwater Kent period; Allen

9:16 p. m.—Atwater Kent period; Allen McCuhae, tenor, and orchestra.
9:45 p. m.—Victory Quartet, Louise Hubbard, soprano; Alice Godillot, sprano; Litta Grimm, contralto; Amy Ellerman, contralto; Amy Ellerman, 660k-WJZ-NEW YORK-455m

950k-WGBS-NEW YORK-316m 3 p. m.—Arrowhead Inn Orchestra. 4 p. m.—Church of the Transfiguration. 8:15 p. m.—Ukrainian chorus and solois 830k—WHN—NEW YORK— 361m 11:30 a. m.-12:30 p. m.—Calvary morn services.
12:30 p. m.—Lexington organ recital.
2-3 p. m.—Queens County Christian

2-8 p. m.—Queens County Christian Endeavor program.
3-4:30 p. m.—Radio Bible class.
4:30-4:40 p. m.—News: sports.
5:30-5:40 p. m.—Roseland Dance Orchestra.
5:30-5:40 p. m.—News and sports.
7:30-9:45 p. m.—Calvary evening services.
15:45-11:15 p. m.—Janssen's Orchestra.
12-12:30 a. m.—Sophie Tucker's Playsround. 1430k—WBNY—NEW YORK—210m

1430k.—WBNY.—NEW YORK.—210m 2:30 p. m.—Consuelo Rivero, pianist. 2:35 p. m.—The Knickerbockers. 2:55 p. m.—Bamby Breadwinners. 3 p. m.—Milton Yokeman, tenor. 3:20 p. m.—Cecelia Rivero. 3:25 p. m.—The Knickerbockers; songs. 4:15 p. m.—Jack Davis, barytone; tenor. 4:40 p. m.—Laurette Reynolds, Cecel Rivero.

5 p. m.—Harmony String Boys.

5:30 p. m.—Tenor solos.

5:45 p. m.—Madame Rivero.

6 p. m.—The Knickerbockers.

1250k—WHAP—NEW YORK—240m 2:30 p. m.—Readings from the Bible. 8:15 p. m.—Concert and sacred must 0:10K-WNYC-NEW YORK-526m 0:15 a. m.—Communion breakfast Fire Department, Holy Name Society. Speakers: Mayor James J. Walker, Car-dinal Patrick J. Hayes. Bishop John J. Dunn, the Rev. Joseph Fleming, Hon. John W. Smith, John J. Dorman, John Kenlon. 570k-WNYC-NEW YORK-526m

1040k-WLWL-NEW YORK-288m 1160k-WRNY-NEW YORK-258m m.—Franco violin ensemble. p. m.—Odierno Quartet. m.—Dr. Christian Reisner's hour

p. m.—Dr. Chileran religion. 5 p. m.—Corradetti hour. 5 p. m.—Twilight hymnal, Ida Weller 5:45 p. m.—Twilight hymnal, Ida Weller WERH—NEW YORK—278m 110k—WFBH—NEW YORK—273m m.—"Illuminato Miserendino," violin 5 p. m.—"Illuminato Miserendino," violin 5:30 p. m.—Franklin Four. 6 p. m.—World Masonic news. 6:30 p. m.—Emory Deutsch; violin recital 6:50 p. m.—Talk. 7 p. m.—Libby Orchestra. 11:30 p. m.—Castillian Royal Orchestra. 11:45 p. m.—Sleepy Orchestra.

880k—WMCA—NEW YORK—341m la.m.—Christian Science lecture, p.m.—Program under auspices of Dr Stieri. Stieri,
5:25 p. m.—Halpert and Fryxell BuckA-Neers.
7 p. m.—Ernie Golden's Orchestra.
7:30 p. m.—Olcott Vail's String Ensemble.
8 p. m.—National tours.
8:30 p. m.—California Ramblers.

1290k—WOKO—NEW YORK—233m a. m.—Services from Chelsea M. Church.
Church.
Church.
Church. 1100k-WBBR-STATEN ISLAND-273m 10 a. m.—Violin duets.
10:15 a. m.—Fred Twaroschk, tenor.
10:25 a. m.—Bible lecture, W. L. Pelle.
10:55 a. m.—Choral singers.
11:05 a. m.—Sunday school lesson; W. Myodwarth

11:05 a. m.—Sunday school lesson; W. Woodworth.

11:25 a. m.—Choral singers, duets.

2 p. m.—Watchtower Orchestra.

2:20 p. m.—Fred Twaroschk, tenor.

3:30 p. m.—Bible lecture, W. L. Pelle.

3 p. m.—F. Twaroschk, tenor.

3:10 p. m.—Bible instruction.

3:30 p. m.—Watchtower Orchestra.

9 p. m.—Watchtower String Quartet.

9:20 p. m.—Bible questions and answe

1230k—WGBB—FREEPORT—244m 10:40 a. m.—Freeport Methodist Church 1190k—WNJ—NEWARK—252m 10:30-12 a. m.—Roseville M. E. Church. 5:30 p. m.—Tivoli Theater Organ. 1190k-WGCP-NEWARK-252m

12:15 p. m.—Elgy Mayer, soprano. 12:30 p. m.—Orchestra. 2 p. m.—Marinello Lady. 2:15 p. m.—Frank Von Neer Artists' Hou

115 p. m.—Frank Von Neer Artists' Hour.
115 p. m.—Zelena Smiley, organist,
130 p. m.—Harry Dodd, barytone,
145 p. m.—Lillan Beckel, ensemble,
115 p. m.—James Browning, tenor,
130 p. m.—Ida Laube, planiste,
145 p. m.—Paramount Trio,
15 p. m.—Hummer & Tardi, instrumental,
15 p. m.—Mildred Tabor, planiste,
15 p. m.—Mildred Tabor, planiste,
15 p. m.—Mildred Tabor, planiste,

8 p. m.—Melick & Van Houten, violini 8:15 p. m.—Mildred Tabor, pianiste. 8:30 p. m.—Mother Goose Girl. 8:45 p. m.—Arline Felker, soprano. 9 p. m.—Hrene Branin, harpist. 9:15 p. m.—Paramount Trlo. 1140k—WAAM.—NEWARK—263m 1840k-WODA-PATERSON-224m 10:30 a. m.—First Baptist Church Service 7:30 p. m.—Market Street M. E. Church

1390k-WRST-BAYSHORE-216m 8-10 p. m.—Dance Orchestra. 590k—WIP—PHILADELPHIA—508m

7:15 p. m.—Evening service.
590k—WOO—PHILADELPHIA—508m 10:45 a. m.—Morning services. 2:30 p. m.—Musical exercises. p. m.—Sacred recital. 760k—WII—PHILADELPHL1—395m

4:30 p. m.—Chapel service. 7:30 p. m.—Church service. 1080k—WCAU—PHILADELPHIA—278m

11 a. m.—Services.
5 p. m.—Recital; Radio Church Service.
6:45 p. m.—Clarence Seaman's Orchestra.
7:45 p. m.—Cathay Concert Orchestra.
8:30 p. m.—Barry O'Moore; Bonwit Teller Ensemble:
9 p. m.—North Hour of Music.
10 p. m.—Charlie Kerr's Orchestra.
1090k—WHAR—ATLANTIC CITY—275m
10.45 a. m.—Morning service. 10:45 a. m.—Morning service. 2:15 p. m.—Short sacred recital. 2:45 p. m.—Sermon, "Christ ( Changing 7:50 p. m.—Evening Service.

p. m.—'An Hour With the Classics."

1000k—WPG—ATLANTIC CITY—300m 3:15 p. m.—Organ recital. 4:15 p. m.—Community, vocal and instru-mental recital. 9:15 p. m.—Traymore Concert Orchestra, 10 p. m.—Concert by artists. 1080k—WHAM—ROCHESTER—278 4 p. m.—Chapel service.

1070k—WNAC—BOSTON—280m
10:55 a. m.—Morning service.
1:30 p. m.—Concert.
6:35 p. m.—Baseball results.

6:45 p. m.—Evening service. 940k—WGR—BUFFALO—319m 940k—WGR—BUFFALO—319m
10:45 a. m.—Morning service.
3-4 p. m.—"A Clinic in Regeneration."
7:45 p. m.—Evening service.
9:15-9:45 p. m.—Jointly with WEAF.
900k—WBZ—SPRINGFIELD—333m
10:45 a. m.—Church services

East Relief.
9 p. m.—Organ recital.
9:30 p. m.—The Merrill Trio.
1120k—WTAG—WORCESTER—268m
7:20-9:15 p. m.—Program from WEAF.
640k—WCAP—WASHINGTON—469m

660k—WJZ—NEW YORK—455m

9 a. m.—Children's hour.

11 a. m.—St. Thomas's Episcopal Church.
2:30 p. m.—Sunday Radio Forum.
3:30 p. m.—Sunday Radio Forum.
3:30 p. m.—Marla Caiati, cellist; Alfred Menconi, planist.
3:55 p. m.—St. George's vesper service—
final service this season.
7 p. m.—Park Avenue Baptist Church carillon.
7:20 p. m.—Pennsylvania Concert Orchestra.
8 p. m.—Bakelite hour, "The Gondoliers."
9 p. m.—Commodore Concert Orchestra.
10 p. m.—Godfrey Ludlow, violinist.
950k—WGBS—NEW YORK—316m monds.
7:20 p. m.—Capitol Family.
9:15 p. m.—Atwater Kent Radio Hour.
9:45 p. m.—Kelth's Radio Review.
1130k—WMAK—BUFFALO—266m
11:25 a. m.—Morning service.
3 p. m.—Concert by Livingston Silv Band.

p. m.—Evening service. 980k—WJAR—PROVIDENCE—306m 220 p. m.—Capitol Family, 215 p. m.—Musical program, 970k—KDKA—PITTSBURGH—461m 11 a. m.—Church service. 4 p. m.—Organ recital. 4:45 p. m.—Vesper services. 6:10 p. m.—KDKA Little Symphony Or-

6:10 p. m.—chestra.
7:20 p. m.—Church chimes.
7:25 p. m.—Church services.
660k—WCAK—PITTSBURGH—461m 6:30 p. m.—Dinner concert.
7:20 p. m.—Capitol Theater Family.

MONDAY

610k—WEAF—NEW YORK—492m
6:45, 7, 7:20 a. m.—Health exercises.
7:45-8 a. m.—Morning prayer services.
11 a. m.—George Kanony, barytone.
11:45 a. m.—George Kanony, barytone.
11:40 a. m.—George Kanony, barytone.
11:40 a. m.—George Kanony, barytone.
11:40 a. m.—My Job," Winter Russell.
12 noon—Market and weather reports.
4 p. m.—Margaret Mack, soprano.
4:15 p. m.—Harriett Buttler, planist.
4:30 p. m.—John Parrish, tenor.
4:45 p. m.—Dorothy Brewster, "Chekhov 5 p. m.—Musical program.
6 p. m.—Dinner music.
6:55 p. m.—Scores.

. m.—Dinner music.
5 p. m.—Scores.
5 p. m.—Columbia University lecture.
6 p. m.—Edgar Gruen, barytone.
7 p. m.—'The Lullaby Lady.'
7 p. m.—Beatrice Oliver's Symphony; Ru 8 p. m.—Beatrice Oliver's Symphony; Ruth Kemper, violinist. 8:30 p. m.—John Drew, actor, "Shake-speare's 'Henry IV.'" 8:45 p. m.—Tnthony Torre, violinist; Jo-seph Biviano, accordionist. 9 p. m.—"A. and P. Gypsies." 10 p. m.—Grand opera, "Les Pecheurs Des Perles."

1-12 p. m.—Ben Bernie's Orchestra. 11-12 p. m.—Ben Bernie's Orchestra.

660k—WJZ—NKW YORK—455m

1 p. m.—Meyer Davis's Orchestra.
2 p. m.—Weather; news service.
1:30, 5:30, 7:30, 10:30 p. m.—News service.
1:4:35, 7:30 p. m.—Baseball reports.
1:5 p. m.—Your Dally Menu."
1:15 p. m.—Dennison's Talk, Doris Clark.
1:25 p. m.—"Shopping Service," Mr.
1:35 p. m.—Commodore tea concert,
1:35 p. m.—Totton quotations.
1:35 p. m.—Financial summary.
1:40 p. m.—Cotton quotations.

5:35 p. m.—Financial summary.
5:40 p. m.—Cotton quotations.
5:50 p. m.—Farm market reports.
7 p. m.—Madison dinner concert.
7:55 p. m.—John B. Kennedy.
8 p. m.—B. Fisher's Orchestra.
9 p. m.—Macling Railroad Revelers.
10 p. m.—Moorland hour.
10:45 p. m.—Harry Leonard's Orchestra.

10:45 p. m.—Harry Leonard's Orchestra.

1410k—WMSG—NEW YORK—210m
6 p. m.—Popular entertainment.
6:30 p. m.—Raymond Maher, barytone.
7 p. m.—Sport talk.
7:15 p. m.—Cliff Jerome's Entertainers.
7:30 p. m.—Lloyd's Entertainers.
8:15 p. m.—Mac and Lennie, humor.
8:45 p. m.—Banjo Eddle, Charles Jordan.
9:15 p. m.—Belle Brooks, Jack Lauria.
10 p. m.—Sherman and Neil, songs.
10:30 p. m.—S. S. Leviathan Orchestra.
1430k—WBNY—NEW YORK—210m

1430k-WBNY-NEW YORK-210m 1430k—WBNY—NEW YORK—210
7 p. m.—Trio.
7:50 p. m.—Movie talk.
8 p. m.—Blue Crest Collegians.
9 p. m.—Harmony Boys.
9:15 p. m.—Drawing Room Players.
9:45 p. m.—Lew Saxon, pianist.
10 p. m.—Loretta Reynolds, songs.
10:15 p. m.—Studio program.
10:45 p. m.—Blue Crest Collegians.

10:45 p. m.—Blue Crest Collegians.
950k—WGBS—NEW YORK—316m
10 a. m.—Timely talks with Terese.
10:10 a. m.—Jack Cohen, pianist,
10:15 a. m.—Radio gym class; pianist,
10:35 a. m.—Fashion talk; piano solos.
1:30 p. m.—Scripture reading.
1:35 p. m.—Marie Draghy, soprano.
1:45 p. m.—Cecile Kurner, pianist.
1:55 p. m.—Marie Draghy,
2:15 p. m.—Marie Draghy,
2:15 p. m.—Cecile Kurner.
2:25 p. m.—The Harmony Boys.
3 p. m.—Travel talks.
3:10-3:30-3:50 p. m.—Sidonie Lieban,
prano.

prano.
3:20 p. m.—"Well-Bred English."
3:40 p. m.—Myrtice Weaver, reader.
6 p. m.—Uncle Geebee.
6:30 p. m.—Louis Gershenson's Orchestra 6:10 p. m.—Herman Neuman, planist. 6:10 p. m.—Market high spots. 6:20 p. m.—Herman Neuman, planist. 6:30 p. m.—Elementary German lessons. 7 p. m.—Advanced German lessons. 7:30 p. m.—Police alarms. 7:35 p. m.—Charles Solm, tenor. 7:56 p. m.—Plano selections.

7:50 p. m.—Piano selections.
8 p. m.—'Baseball,' John B. Foster.
8:15 p. m.—Marie Hauth, soprano.
8:30 p. m.—Irving Cohen, violinist.
8:45 p. m—'Supreme Court and How Operates," Justice Joseph Proskauer.
9 p. m.—Idle Hour Male Quartet.
9:30 p. m.—Joseph Wohlman, pianist.
10:10 p. m.—Lecture service.
10:30 p. m.—Police alarms; weather forecasts.

asts. 880k—WMCA—NEW YORK—341m 10:15 a. m.—Employment opportunities, 10:30 a. m.—Market reports (hourly 3:30 p. m.) 10:30 a. m.—Market reports (hourly t 3:30 p. m.)

11 a. m.—Jack Cohen, pianist.
12:15 p. m.—Department of Agriculture.
12:30 p. m.—Olcott Vail's String Ensemble
2 p. m.—Theo Alban tenor.
3 p. m.—Sam Coslow, barytone.
4 p. m.—Bob Brandes, songs.
4:15 p m.—Lost and Found department.
5:45-7 p. m.—Employment opportunities.
6 p. m.—Olcott Vail's String Ensemble.
6:30 p. m.—Emile Golden's Orchestra,
7 p. m.—Talk by H. L. Stratton.
7:10 p. m.—Erne Golden's Orchestra.
7:30 p. m.—Gertrude Phillips, Shakesperean roles.
8 p. m.—Terminal music hour.
9 p. m.—Lecture, Christian Science.
10:15 p. m.—Coughlan announcement; news

0:15 p. m.-Coughlan annou editor.

10:30 p. m.—Woodmansten Orchestra.

11 p. m.—Manhattan Serenaders.

11:30 p. m.—Ray Kleges, Jessie Greer, songs.

12 midnight—McAlpin Entertainers.

12:15 a. m.—Stauch's Orchestra.

830k-WHN-NEW YORK-361m 2:15 p. m.—Selma Cahn, songs. 2:25 p. m.—Louis Marshall, guitar. 2:40 p. m.—Genevieve Schmehl, songs. 2:50 p. m.—Jimmy Clarke's Entertainers 5:10 p. m.—News and sports. 3:45 p. m.—Frank Galassi, songs. 4:10 p. m.—Haines's good news party. 4:30 p. m.—Helen Thompson, soprano. 4:40 p. m.—Alec Compinsty cello. 140 p. m.—Alec Compinsky, cello.
150 p. m.—Eddie Gillis, barytone.
150 p. m.—News and sports.
160 p. m.—Beauty talk.
15 p. m.—Bobby Klink, tenor.

30 p. m.—Mark Dalton, planist. 45 p. m.—B. Douglas, Malvine Edness 7:45 p. m.—B. Douglas, Malvine Ednes duets.
8 p. m.—Roseland Dance Orchestra.
8:25 p. m.—"Storage Batteries," H. Shontz.
8:30 p. m.—George's Surprise.
9 p. m.—Leverich Three and "Peter ti Great."
9:15 p. m.—Lake by W. B. Boughton.
9:20 p. m.—Leverich Three.
9:30 p. m.—Leverich Three.
9:30 p. m.—Leverich Three.
10:30 p. m.—Leverich Three.
10:30 p. m.—Leverich Three.
10:30 p. m.—Leverich Three.
11:30 p. m.—Leverich Three.
11:30 p. m.—Alabam Orchestra.
11:30 p. m.—Alabam Orchestra.
11:40k—WENY—NEW YORK—258m

25 p. m.—News and sports. 30 p. m.—WHN Movie Club.

2 midnight—Silver Silpper Orchestra.

1160k—WRNY—NEW YORK—258m
2 noon—Musical Courier says.

2:15 p. m.—Harvey Schloeman, songs.

2:30 p. m.—Studio artist.

2:45 p. m.—Jack Fuld, planologues.

550 p. m.—Poetry, Lillian Brown.

p. m.—Sport Rays.

15 p. m.—Commercial Digest.

15 p. m.—Jack Fuld, planologues.

30 p. m.—Orlando's Concert Orchestre.

15 p. m.—Frances Peper, songrang.

Gernsback.

15 p. m.—Nina Cooper, soprano.

30 p. m.—Florence Gerringer, planist.

45 p. m.—Judith Roth, soprano.

9 p. m.—Ivan Sofferman's Orchestra.

1 p. m.—Ivnine Players: "The Light. 1100k-WFBH-NEW YORK-273m

1100k—WFBH—NEW YORK—273m
m.—Orchestra.
m.—J. Moore, tenor.
p. m.—Bernie Pollock, songs.
p. m.—"Interior Decorating."
p. m.—Wiltar Nadine, soprano,
m.—Edwin Howard, violinist,
p. m.—William Hirschman, barytone.
p. m.—William Hirschman, barytone.
p. m.—Jack Cohen, pianist,
m.—Lou Henkel, Mildred Lee, songs.
p. m.—Miriam Davis, soprano.
p. m.—Greystone Trio.
m.—Lou Henkel, Mildred Lee, songs.
p. m.—American Legion News.
p. m.—American Legion News.
p. m.—Carl Smith, Joe Davis, songs.
p. m.—Belle Brooks, songs.
p. m.—Belle Srooks, songs.

1290k—WOKO—NEW YORK—233m p. m.—Cecile Kurner, pianist. 115 p. m.—Nicholas Covino, Michael Malo, banjo and guitar. 130 p. m.—Sunshine Sonny. p. m.—Briarcliff String Serenaders. 1250k—WHAP—NEW YORK—240m
30 p. m.—Holmes String Ensemble.
15 p. m.—Lucile Wilkin, pianist,
45 p. m.—News digest,
05 p. m.—Vida Milholland, soprano.
20 p. m.—Mary Price, "Air Quest)

naire."

35 p. m.—Sibyl Huse, speaker.
p. m.—Sylvan String Trio.

15 p. m.—James P. B. Hyndam, "The
Norse Mythology."

35 p. m.—Sylvan String Trio.

50 p. m.—Listeners veriety. 55 p. m.—Syrvan String 1710.

50 p. m.—Listeners variety: WHAP
men's quartet; Lucile Wilkin, Dorothy
Hoyle, Steel Jamison, Darl Bethmann,
Ruth Montgomery and Phyllis Kraeuter.

1040k-WLWL-NEW YORK-288m 8:30 p. m.—Chamber music.

9 p. m.—Question box.

9:30 p. m.—Schickerling Concert.

10 p. m.—Study Club.

10:15 p. m.—Carroll Club.

10:35 p. m.—St. Cecilia Ensemble. 100k-WBBR-STATEN ISLAND-273 m.—Irene Kleinpeter, soprano,
p. m.—World News Digest,
p. m.—George Twaroschk, violinist,
p. m.—Bible Instruction
p. m.—Bible Instruction

8:30 p. m.—George Twaroschk, violinist.
8:40 p. m.—Bible Instruction.
8:50 p. m.—Irene Kleinpeter, soprano.
950k—WAHG—RICHMOND HILL—316m
12 noon—Grebe Matinee Trio.
7:30 p. m.—Walter Iooss, pianist.
7:45 p. m.—Martha Brauninger, soprano.
8 p. m.—Synchrophase Hour.
9 p. m.—Major Dent Atkinson.
9:15 p. m.—Sterling Male Quartet.
9:30 p. m.—Janet Bush-Hecht, contraito.
10 p. m.—John and Harry Diehl, zither and piano.
10:20 p. m.—Ferruscit, P. M. Sterling Main.

10 p. m.—John and Harry Diehl, Zither a piano.

10:20 p. m.—Ferrucci's Radio Raiders.

11:02 p. m.—Ferruci's Radio Readers.

12 midnight—Frank Tremer's Orionites.

1230k—WGBB—FREEPORT—244m

8 p. m.—Arthur Suydam, pianist.

8:15 p. m.—Emma Sunshine, reader.

8:30 p. m.—Harry Davis, basso.

8:45 p. m.—McGinn-Bluett, duet.

9 p. m.—Serenaders.

9:30 p. m.—John Cramer, xylophone.

9:45 p. m.—Paul Hoffman, tenor.

10 p. m.—Trau Hohman, tenor.
10 p. m.—Trau
10:15 p. m.—Harold Manning, saxophone.
10:30 p. m.—Korean Dance Orchestra.
1190k—WNJ—NEWARK—252m
7-02 p. m.—Raschall scores 1190k—WNJ—NEWARK—252m
p. m.—Baseball scores,
p. m.—Elizabeth Speelman, pianist,
p. m.—Ed Perlov, "Carpets."
p. m.—David Collins, tenor,
m.—Stern's Ritz organ,
1190k—WGCP—NEWARK—252m
m.—Parisi and Tedesco, violin standaccordion.

piano accordion. 30 p. m.—Piano duo. 6:30 p. m.—Piano duo.
8:30 p. m.—E. S. Campbell, concert.
9 p. m.—Ray Baylor's Orchestra.
10 p. m.—Victor Herbert program.
10:30 p. m.—102d Cavalry Band.
11:30 p. m.—102d Cavalry Band.
11:45 p. m.—Oriental Trio.
740k—WOR—NEWARK—405m
6:45-7:15-7:45 a. m.—Gym class.
2:30 p. m.—Clarence Bloemker, tenor.
2:45 p. m.—Johnny Cantwell, comedian.
3 p. m.—Irma Carrell, planist.
3:15 p. m.—Clarence Bloemker. tenor.
3:30 p. m.—Irma Carrell, planist.
3:45 p. m.—William Sewell. "Slip Covers."
6:15 p. m.—Bill Wathey. "Sports."
6:30 p. m.—Jacques Jacobs's Ensemble.
7:30 p. m.—Copenhagen Quartet.
8 p. m.—"Current Events" lecture, H. V.
Kaltenborn.

7:30 p. m.—Copennagen Quartet.
8 p. m.—Current Events" lecture, H. V. E. Kaltenborn.
8:30 p. m.—Feland Gannon, barytone.
8:45 p. m.—Klein's Serenading Shoemakers.
9:45 p. m.—"Congo Marriage Customs," Chester De Vonde.
10 p. m.—"An Hour With Omar Khayyam"; Proschowsky Quartet and Studio Ensemble.
11 p. m.—News bulletin.
11 1:05 p. m.—Five Messner Brothers.
11:30 p. m.—"Bunk of 1926."
11:45 p. m.—Five Messner Brothers.
11:40k—WAAM—NEWARK—263m
11 a. m.—Happy Hour program.

1140k—WAAM—NEWARK—263m
a. m.—Happy Hour program.
p. m.—Francis Jones's Brownies,
p. m.—Resume of sports,
15 p. m.—Nita's Gang,
16 p. m.—Nita's Gang,
17 p. m.—Nita's Gang,
18 p. m.—Mayor of Holly Park,
p. m.—Stewart Fashion Plates,
p. m.—Eswart Fashion Plates,
p. m.—Versatllity Boys,
p. m.—Joe Brown's Orchestra,
1340k—WODA—PATERSON—224m
p. m.—Enertainment. p. m.—Entertainment.
30 p. m.—News; sport talk.
p. m.—Stanley Todd's Orchestra. 8:15 p. m.—Plays worth while, 8:30 p. m.—Magno, Passaro, violin piano.
p. m.—Cresendo Mandolin Club.
30 p. m.—M. E. K.'s Gang.
p. m.—Popular songs.
0.30 p. m.—Seligson Sisters, Sam Cohen,

entertainers.
1390k—WRST—BAYSHORE—216m
p. m.—Jack Watson's Orchestra.

1500k—WRS1—BAISHOEE—216m p. m.—Jack Watson's Orchestra. 45 p. m.—Musical program. 590k—WIP—PHILADELPHIA—508m

4 p. m.—Market Hints to Housewives, 4:15 p. m.—"Home Gardening." 6:05 p. m.—Dinner music. 7 p. m.—Roll Call, Birthday List; violi

2 p. m.—Organ recital. 2:20 p. m.—Religious service. 2:35 p. m.—Concert orchestra 12:35 p. m.—Concert orchestra.

2 p. m.—Arcadia Concert Orchestra.

2:30 p. m.—Heart Talk.

4:35 p. m.—Artist recital.

5 p. m.—Talk, auspices Peirce School.

5:15 p. m.—Sesquicentennial program.

7:30 p. m.—Dram Daddy.

8 p. m.—Short Agro-Waves.

8:30 p. m.—Starr Piano Company artists.

9 p. m.—Starley Theater Hour.

10 p. m.—Arcadia Dance Orchestra.

10:30 p. m.—El Patio Dance Orchestra.

760k—WFI—PHILADEL PHILA.

760k—WFI—PHIIADELPHIA—395m 0:30 a. m.—Civic Pride Association. p. m.—Tea Room Ensemble. 3 p. m.—Maplewood School for Boys; ta and musical selections.

30 p. m.—Concert Orchestra.

7 p. m.—Dance orchestra.

(:15 p. m.—Federation of Jewish Charities.

1,080k—WCAU—PHILADELPHIA—278m
2:30 ·p. m.—Recital by N. Spellanburg m.—Recital by N. Snellenburg. n.—Carolyn Thomas, soprano. 8:30 p. m.—The Hood Boys. 8:45 p. m.—Kathryn Fichthorne, traito. traito.
) p. m.—The Merry Minstrels.
9:30 p. m.—Roy Tracy, tenor.
9:45 p. m.—Chalfont Sisters, songs.
10 p. m.—Larry Costigan.

10 p. m.—Larry Costigan,

590k—WOO—PHILADELPHIA—508m

11 a. m.—Grand organ,
12 noon—Luncheon music,
4:45 p. m.—Grand organ and trumpets,
7:30 p. m.—Dinner music,
8 p. m.—Grand organ recital,
8:30 p. m.—Mass meeting, Academy of
Music,
10 p. m.—Grand opera, "Les Pecheure Des
Perles." 1 p. m .-- Adelphia Dance Orchestra. ,090k-WHAR-ATLANTIC CITY-275m

p. m.—Seaside Trio.
30 p. m.—Book Review, Edna Hoopes.
p. m.—Seaside Trio.
p. m.—Bergere Dance Orchestra. ,000k-WPG-ATLANTIC CITY-300m 4:30 p. m.—Tea music. 5:45 p. m.—Organ recital. 7 p. m.—Morton dinner music. 7:50 p. m.—Talk by Arthur Eldred. 3 p. m.—Children's Hour. Cap'n Daddy Long Legs. p. m.—Children's Hour. Long Legs. 30 p. m.—Piano recital.

p. m.—Ambassador Concert Orchestra.
p. m.—Vocal recital; Galen Hall Tri.
p. m.—McKnight's Dance Orchestra. 1080k-WHAM-ROCHESTER-278m 30 p. m.—Theater organ. p. m.—Eastman Theater organ. 30 p. m.—Eastman Theater Orchestra. 940k—WGR.—BUFFALO—319m
:30 p. m.—Californians Orchestra.
p. m.—Jack Bishop's Orchestra.
p. m.—Wheat's Division.
0 p. m.—Charles Duff's friends.

p. m.-1 a. m.—Supper Music. 1130k—WMAK—BUFFALO—266m 30 p. m.—Dinner music. 30 p. m.—Musical. p. m.—Livingston Silver Band. p. m.—Musical programs.

790k—WHAZ—TROY. N. Y.—380m
30 p. m.—Russell Sage College Glee Club
and instrumentalists.
p.m.—Troy Chamber of Commerce
Night Concert and instrumentalists.

1 p.m.—Troy Chamber of Commerce Night Concert, 980k—WJAR—PROVIDENCE—306m

10:45 a. m.—Home service department, 1:05 p. m.—Studio program, 7:45 p. m.—Musical program, 9 p. m.—A. & P. Gypsies, 10 p. m.—Grand Opera Hour, 630k—WTIC—HARTFORD—476m

630k—WTIC—HARTFORD—476m

12 m.—Travelers Orchestra.
6:30 p. m.—"The Children's Entertainer.
6:50 p. m.—Hub Trio,
8:30 p. m.—Capitol Theatre Orchestra.
8:15 p. m.—'White Mountain District,"
by Frederick Tilbourne.
9 p. m.—Mme. Fely Clement, soprano.
9:30 p. m.—Heimberger's Dance Orchestra.
10 p. m.—Grand Opera Hour.
11 p. m.—Travelers Symphonic Ensemble.
1070k—WNAC—BOSTON—280m

10:30 a. m.—Women's Club talk; solos; news.

p. m.—Luncheon concert. p. m.—Luncheon concert.
p. m.—Copley Plaza Trio.
:20 p. m.—The Blonde Pianist.
p. m.—Kiddies Club.
:30 p. m.—Sam Blum's Orchestra.
p. m.—Dinner dance.
:35 p. m.—"The Wonders of the Microscope."

7.33 p. m.—The Wonders of the Mic scope."

8 p. m.—Metropolitan Theater Studio. 9:15 p. m.—Metropolitan Theater str. 10:15 p. m.—Dance music. 10:15 p. m.—Dance music. 10:15 p. m.—Theater organ recital. 860k—WEEI—BOSTON—349m

12 m.—Keith's Radio Review. 12:45 p. m.—Gommunity Talks. 3:10 p. m.—Bert Arnold's Orchestra. 5 p. m.—Stock Market News. 6 p. m.—Stock Market News. 6 p. m.—Keith's Radio Review. 1:10 p. m.—Events of the Day. 6:20 p. m.—Alice Heidi Talks. 6:45 p. m.—Big Brother Talk. 7:30 p. m.—Black Iron Shiners. 8:15 p. m.—A. % P. Gypsies. 10 p. m.—A. % P. Gypsies. 10 p. m.—E. Andrews' Orchestra. 300k—WBZ—SPRINGFIELD—333m

p. m.—Ed Andrews' Orchestra. 900k—WBZ—SPRINGFIELD—333m 900k—WBZ—SPRINGFIELD—333m
:45 p. m.—Farm Flashes.
; p. m.—Capitol Theatre Orchestra.
;30 p. m.—Organ recital.
) p. m.—Haif-hour of camp.
;30 p. m.—Empire Singing Orchestra.
10:30 p. m.—To be announced.
1120k—WTAG—WORCESTER—268m
10:30 c. m.—Musical selections: talk 12:05-2 p. m.—Luncheon music.
1 p. m.—"Birds," Wendell Parker.
7:15 p. m.—"Twillight Scouts."
7:45 p. m.—Official Boy Scout.
8 p. m.—"Shrubs." C. L. Thayer.
8:30 p. m.—WTAG Entertainers.
9-10 p. m.—Program to be announced.
10:11 p. m.—Grand opera.
6:40k.—WCAP—WASHINGTON—469m
6:45 a m.—"Tower Health Exercises."

640k—WCAP—WASHINGTON—469m 6:45 a. m.—"Tower Health Exercises." 7:30-9 p. m.—"Queen Quirks of Nature" and studio program. 9 p. m.—A. & P. Gypsies. 10 p. m.—Grand opera, "Les Pecheurs des Perles." 640k—WRC—WASHINGTON—469m m.—Organ recital. m.—Raleigh Orchestra. p. m.—"Housekeepers' Chat." 45 p. m.—"Things Talked About."

Time Wave P. M. Station length Orchestra

MONDAY, MAY 24

Dance music Charlie Kerr's Janssen's Castillian Royal

B. Fisher's Jack Bishop's

Roseland E. Heimberger's

Ed Andrews's
Arcadia
Ivan Sofferman's
Joe Brown's
Corean
H. Leonard's
Eil Patio
McKnight's
Ben Bernie's
Adelpita
Dance music
Bergere's
Dance music
Connie's Inn
Stauch's

WRST WCAU WHN

8-10 10:00 10:45 11:30

11:12 11:00 11:05 11:30 12:15

Daylight Saving Time K-kilocycles

830k—WHN—NEW YORK—361m 12:30 p. m.—Loew's Lexington organ

cital. 2-3:10 p. m.—Overture and vaudeville.

5:10 p. m.—Arthur Caisu, annua songs.
5:25 p. m.—News and sports.
6:30 p. m.—Everglades Orchestra.
7 p. m.—Musical program.
7:30 p. m.—Will Oakland's Chateau.
8 p. m.—Treasureland Neighbors.
8:30 p. m.—Prince Piotti, songs.
8:45 p. m.—Clarence Williams Trio.
9:16 p. m.—Don Stinson, songs.
9:30 p. m.—Loew's Orchestra.
110 p. m.—Universal Trio.

10 p. m.—Universal Trio.
10:30 p. m.—Strand Orchestra.
11 p. m.—Barn Orchestra.
11:30 p. m.—Sophie Tucker's Playground.

570k—WNYC—NEW YORK—526m :35 p., m.—Herman Neuman, planist. :45 p. m.—Market high spots. :55 p. m.—"Songs of Yesterday and

day."

15 p. m.—Anna Merli, pianist.

30 p. m.—Police alarms.

35 p. m.—Lecture, Winter Russell.

05 p. m.—Walter Schuster, tenor;

Loesch, violinist.

Loesch, violinist.

9 p. m.—"Some Famous Letter Writers,
Joseph Crowne.

9:20 p. m.—Instrumental program by the
Plectra Club.

10:30 p. m.—Police alarms; weather.

1100k-WFBH-NEW YORK-273m

1100k—WFBH—NEW YORK—273m

2 p. m.—Orchestra.

3 p. m.—Studio program.

4 p. m.—Rita Olmstead, songs.

4:15 p. m.—Eddie Woods, barytone.

4:30 p. m.—Ralph Rose jr., violin.

5 p. m.—Hamilton Wilson, recitations.

5:15 p. m.—'Prince Piotti."

6 p. m.—Theo Alban, tenor,

6:15 p. m.—Radio talk, Bill Schudt jr.

6:30 p. m.—Majestic String Ensemble.

880k—WMCA—NEW YORK—341m

10:15 a. m.—Employment Opportunities.
10:30 a. m.—Market reports.
11 a. m.—Ida Allen's Homemakers' Clul
11:30 a. m.—Lucille Buhl, "Making a Nev
Face."

Face."
12:15 p. m.—Department of Agriculture.
12:30 p. m.—Olcott Vail's String Ensemble.
1:30 p. m.—Market reports (hourly to 3:30

1:30 p. m.—Market reports (hourly to 3:3 p. m.).
2 p. m.).
2 p. m.—Sherman and Neale, songs.
3 p. m.—Uklele Dick Hughes.
5:45 p. m.—Employment Opportunities.
6 p. m.—Olcott Vail's String Ensemble.
6:30 p. m.—Employment Opportunities.
6:40 p. m.—Suzanne Richmond, soprano.
6:45 p. m.—Talk by H. L. Stratton.
6:45 p. m.—Talk by H. L. Stratton.
6:45 p. m.—Suzanne Richmond, soprano.
7 p. m.—Hofbrau Haus Entertainers.
7:30 p. m.—Sachs Quality Boys.
8 p. m.—Pace Institute program.
8:20 p. m.—Palmer Pen Lesson.
8:30 p. m.—California Rambiers.
9 p. m.—Columbia Park Entertainers.
10:30 p. m.—Coughlan Entertainers.
11 p. m.—Ernie Golden's Orchestra.
2 midnight—McAlpin Entertainers.
1160k—WRNY—NEW YORK—258m

1160k—WRNY—NEW 10161—20061 2 noon—Organ recital. 345 p. m.—Hulsman's "Body Fit" talks. p. m.—Sport Rays. 110 p. m.—Commercial Digest. 115 p. m.—Wolff Kaufman, saw player. 130 p. m.—Lester Bingley, Clara Mather

duets.

45 p. m.—Orlando's Concert Orchestra.

15 p. m.—'Editing a Science Magazine.

30 p. m.—New York Edison Hour.

30 p. m.—Huarte's Spanish Ensemble.

115 p. m.—'Music or Static,'' M. I

Muhleman.

Down Broadway.

THURSDAY, MAY 27

FRIDAY, MAY 28

WCAU WEAF WMCA WHN WHAR WFBH WHN

\VMCA 341 WPG 300 WEBJ 273 WBZ 333

Ben Bernie's
Hudson-Essex
Louis Gershenso
Dance music
Dance music
Nat Martin's
Freddie Rich's
Bill Walsh's
Leroy Smith's
Louis Gershenso
Parodians
Vincent Lopez
E. Golden's

Woodmansten Inn Million Dollar Luna's Brunswick

1160k-WRNY-NEW YORK-258m

3:10 p. m.—News and sports. 3:20 p. m.—Loew's Lexington Orchestra

news and sports. 5:10 p. m.—Arthur Calad, Milton Mayer

1220k-WBAL-BALTIMORE-246m 30 p. m.—Dinner orchestra. 30 p. m.—WBAL Sandman Circle. p. m.—Artists' recital.
0 p. m.—Talk by Norman Clark.
0:10 p. m.—Treble Clef Club.
1 p. m.—WBAL Ensemble. 970k-KDKA-PITTSBURGH-461m

dress, 9:30 p. m.—Johnson C. Bane, guitarist, 10 p. m.—Ruud Light Opera hour. 650k—WCAE—PITTSBURGH—461m 6:30 p. m.—Dinner concert. 7:30 p. m.—Sunshine Girl. 8 p. m.—Studio concerts. 10 p. m.—Grand opera. 11:05 p. m.—Dance orchestra.

TUESDAY

610k-WEAF-NEW YORK-492m 3:45, 7 and 7:20 a. m.—"Health Exe 6:45, 7 and 7:20 a. m.—"Health Exercises.
7:45-8 a. m.—Morning Prayer Services.
11 a. m.—Wanda Norman, planist.
11:10 a. m.—Harriette Weems.
11:25 a. m.—Wanda Norman, planist.
11:35 a. m.—Motion Picture Forecast.
11:36 a. m.—Music.
12 noon—Market and Weather Reports,
4 p. m.—Neilie Walker, soprano.
4:15 p. m.—Beula Le Verde Duffey, planist.
4:30 p. m.—Women's Program. Mrs. Martin Strauss: "Mother's Club." Edith
Alexander, songs.
5 p. m.—Musical Program.
6 p. m.—Dinner music.
6:55 p. m.—Scores.

55 p. m.—Scores. p m.—Earl C. Little, basso. 10 p. m.—Columbia University Frenc Course Course.
30 p. m.—Salon Concert.
p. m.—"The Grand Prize Eurekas."
30 p. m.—"The Gold Dust Twins."
p. m.—"Eveready Hour."
0 p. m.—"Variety Half Hour."
0.30 p. m.—Vincent Lopez's Orchestra.
1-12 p. m.—"The Buffalonians." 660k-WJZ-NEW YORK-455m

4:30, 5:30, 7:30, 10:30 p. m.—News Service.
4, 4:35, 7:30 p. m.—Baseball Reports.
4 p. m.—"Your Daily Menu".
4:15 p. m.—"A Beautiful Skin".—Elizabeth Arden.
4:25 p. m.—Olive Foster, "Water Plants."
4:35 p. m.—Commodore Tea Music.
5:32 p. m.—Market Quotations.
5:35 p. m.—Financial Summary.
5:40 p. m.—Gotton Quotations.
5:50 p. m.—Fearm Market Reports.
7\*\*ep. m.—Frank Dole, of the Herald Tribune, "Sealyham."
7:15 p. m.—Dinner Music.
8:30 p. m.—The Deltah Pearl Hour "Gems of Romance."

or Romance."
9 p. m.—Breyer Hour.
10 p. m.—The Grand Tour "Home Again."
10:45 p. m.—George Olsen's Orchestra.
1410k—WMSG—NEW YORK—210m 3 p. m.—Walter Kolomoku's Hawaiians. 330 p. m.—Theo Alban, tenor. 7 p. m.—Sport talk. 7:15 p. m.—Max Smolen's Concert Or-

cnestra.

8 p. m.—Clarence Williams Trio.

8:30 p. m.—Leigh Lovel, musical logues.

9 p. m.—E. W. Dannals, radio talk.

9 p. m.—Gerlick and Nill, saxophone and piano.

10 p. m.—Judith Roth, soprano.

10:30 p. m.—S. S. Leviathan Orchestra. 1430k-WBNY-NEW YORK-210m

1430k—WBNY—NEW YORK—Z10m

[ p. m.—Trio.
] p. m.—Joseck "Himself."

8:15 p. m.—Ona Welsh, Babe Adler, songs.

8:45 p. m.—Steve Andrews, uke.

9 p. m.—Rose Fisher, planist.

9:15 p. m.—Ruth Jackson, soprano.

9:30 p. m.—Dagmar Dance Orchestra.

10 p. m.—Studio program.

10:15—Dagmar Dance Orchestra.

acal—WGRS—NEW YORK—316m 950k—WAHG—RICHMOND HILL—316m 12 noon—Musical program. 740k—WOR—NEWARR—405m 740k—WOR—NEWARK—405m
6:45-7:15-7:45 a. m.—Gym class.
2:30 p. m.—Julius Seebach, barytone.
2:45 p. m.—Julius Seebach, barytone.
3:15 p. m.—Louis Serge, guitarist.
3:30 p. m.—Harry Jentes Entertainers.
6:15 p. m.—Bill Wathey, "Sports."
6:30 p. m.—News bulletin.
6:40 p. m.—Bretton Hall String Quartet. 950k-WGBS-NEW YORK-316n 10 a.m.—Timely talks with Terese.
10:10 a.m.—Laura Remsberg, soprano.
10:15 a.m.—Radio Gym Class; songs.
10:35 a.m.—"Salads and Sandwiches

10.35 a. m.—Radio Gym Class; songs.

10.35 a. m.—"Salads and Sandwiches"; songs.

1:30 p. m.—Scripture reading.

1:35 p. m.—Pirates Den Orchestra.

3 p. m.—Talk on tennis.

3:10 p. m.—Talk on tennis.

3:10 p. m.—Talk on tennis.

5:50 p. m.—Piano lessons.

6 p. m.—Uncle Geebee.

6:30 p. m.—Herman Laska, pianist.

6:50 p. m.—Captain Gerald Griffin, "Naval and Merchant Marine Officers."

7 p. m.—Arrowhead Concert Orchestra.

8 p. m.—Play, "A Minuet," by Louis N.
Parker.

8:20 p. m.—Roxana Erb, contralto.

8:40 p. m.—Cameron Rogers, "Walt Whitman's New York."

8:45 p. m.—Enharmonic Vocal Ensemble.

9:15 p. m.—Pauline Watson, violinist.

9:45 p. m.—May Singhi Breen, ukulele;
Peter de Rose.

10 pm.—Alonzo Bellis, xylophone.

0 p. ma.-Alonzo Bellis, zylophone.

10:30 p. m.—Arrowhead Dance Orchestra.

1040k—WLWI—NEW YORK—288m
9 p. m.—Helen McCarthy, pianist.
9:15 p. m.—"Speedwriting."
9:30 p. m.—Harmony Quartet.
9:45 p. ni.—Gerard Dunn, violinist.
10 p. m.—"Timely Topics," Rev. James Gills.
10:15 p. m.—Harmony Quartet.
10:30 p. m.—Talk by the Commonweal.
10:45 p. m.—Redferne Hollinshead, tenor.
1100k—WEBJ—NEW YORK—273m

6:30 p. m.—News bulletin,
6:40 p. m.—Bretton Hall String Quartet.

1190k—WGCP—NEWARK—252m

9 p. m.—Aeronautical Club of New Jersey,
General John J. Pershing, Governor Al
Smith, Mayor James Walker, Governor A.
Harry Moore, Rear Admiral Moffett,
U. S. N.; Edward Rickenbacker.
1190k—WNJ—NEWARK—252m

6:05 p. m.—Lincoin Highway Inn.
7 p. m.—Joseph Murphy, pianist.
7:15 p. m.—Gene Blake, soprano.
7:30 p. m.—Gene Blake, soprano.
7:35 p. m.—Gene Blake, soprano.
7:45 p. m.—Charles Darlington, barytone.
7:58 p. m.—Stern's Ritz Organ.
11:40k—WAAM—NEWARK—263m

10:30 a. m.—Happy Hour program.
11 a. m.—Cooking School.
11:30 a. m.—Happy Hour program.
6 p. m.—Frank Dailey's Orchestra.
7 p. m.—Sport talk, Major Tate.
7:15—Carl Smith, tenor.
7:40 p. m.—Wars of America Monument,"
Carl Bannwart.
7:55 p. m.—Ernest McChesney, tenor.
8:15 p. m.—Ernest McChesney, tenor.
8:15 p. m.—Ernest McChesney, tenor.
8:15 p. m.—Ersat Orange High School Orchestra.
9 p. m.—Verdure lawn and garden talk 8:15 p. m.—East Orange High School Or chestra.

9 p. m.—Verdure lawn and garden talk.

9:15 p. m.—Y. M. C. A. hour of music 10:15 p. m.—Red Naught's Collegians.

1240k—WODA—PATERSON—224m

12 (noon)—Dance music.

12:30 p. m.—Popular songs.

5 p. m.—Studio program.

5:30 p. m.—News; sport talk.

6 p. m.—Jimmy Love's Orchestra.

8:15 p. m.—Jerry La Salle's Orchestra. 10:45 p. m.—Redferne Hollinshead, tenor.

1100k—WEBJ—NEW YORK—273m
7 p. m.—Leon H. Fox, violin soloist.
7:20 p. m.—Isabel Henderson, soprano.
7:30 p. m.—Luna's Marine Band.
8:15 p. m.—Jerry La Salle's Orchestra.
8:15 p. m.—Jerry La Salle's Orchestra.
9:15 p. m.—Entertainment.
9:30 p. m.—Entertainment.
9:30 p. m.—Edward Becker, the biter and egg man degged for the process of the second control of the process 6.30 p. m.—Jimmy Love's Orchestra.
8.15 p. m.—Jerry La Salle's Orchestra.
9 p. m.—Talk.
9.15 p. m.—Entertainment.
9.30 p. m.—Et George's Dramatic Club.
10.15 p. m.—Edward Becker, the big butfer and eav man

TUESDAY, MAY 25

WEDNESDAY, MAY 26

Jerry La Salle's Lund's Loew's Dance music Red Naugh's

Red Naught's
Dance music
Billy Hay's
Vincent Lopez
El Patie
Vincènt Lopez
Arrowhead Inn
George Olsen's
McKnight's
E. Golden's

Fess Williams's
E. Golden's
Castillian Royal
Dance music
Raymond
C. Seaman's

Kramer's
Dance music
Woodmansten Ing
Ed Bugler's

Arcadia Jolly Frolickers

WODA 224
WEBJ 273
WHN 861
WPG 300
WAAM 263
WHN 361
WCAU 278
WEAF 492
WIP 508
WFI 395
WGBS 316
WJZ 455
WPG 300
WMCA 341

7:30 WFBH
8-9:30 WRST
8:00 WEBJ
8:10 WCAU
9:00 WCAE
9-10:30 WHN
9:30 WEBJ
10:00 WLIT
10:00 WGBB

1390k—WRST—BAYSHORE—216m 8-10 p. m.—Central Islip Orchestra. 590k—WIP—PHILADELPHIA—508m

solo.

8 p. m.—Dramatic reviews.

8:15 p. m.—"The Importance of Environment in the Education of the Child."

J. S. Heberbing.

8:30 p. m.—Ralph Wieder, barytone; Louis

Smith, tenor.

9 p. m.—Recital by artists.

10:30 p. m.—El Patio Orchestra. 10:30 p. m.—El Patio Orchestra.

760k—WLIT—PHILADELPHIA—395m
11 a. m.—Organ recital.
12 noon—Organ recital continued.
12:20 p. m.—Religious service; orchestra.
2 p. m.—Arcadia Concert Orchestra.
2:30 p. m.—'Household Hints.''
4:35 p. m.—Republican Women of Pennsylvania; artist recital.
7:30 p. m.—Plays reviewed.

8001.

590k—WOO—PHILADELPHIA—508m, 11 a. m.—Grand organ, 12 noon—Luncheon music. 4:45 p. m.—Grand organ and trumpets. 130 p. m.—Grand organ and trumpets.
130 p. m.—Parodians' Orchestra.
130 p. m.—Snellenburg isstrumental trio.
130 p. m.—Theater digest.
130 p. m.—The Three Brothers.
135 p. m.—Peter Ricci, barytone.

45 p. m.—Charles Higgins, Joe songs.

p. m.—Kuehnle's artists.

p. m.—Robert Fraser, singer; F
beth Holtz, planist.

p. m.—Eddie Melle's entertainers.

10:30 p. m.—Billy Hays's Orchestra.

760-WFI-PHILADELPHIA-395m p. m.—Tea room ensemble.
p. m.—Vocal and instrumental artists.
30 p. m.—Concert orchestra.
p. m.—Dance orchestra.
15 p. m.—Sesquicentennial Exposition.
11 p. m.—Program from WEAF. 1090k—WHAR—ATLANTIC CITY—275m 2 p. m.—Seaside Trio. 7:30 p. m.—"Glimpses Through the Stage

1:05 p. m.—Biltmore Concert Ensemble. 7:30 p. m.—Musical program. 8-10 p. m.—Program same as WEAF. 1070k—WNAC—BOSTON—230m 10:30 a. m.—Women's Club talks; news.
p. m.—Luncheon concert.
p. m.—Metropolitan Theater music.
p. m.—The Smilers.

p. m.—The Smilers.
30 p. m.—Dinner dance.
p. m.—The Radient Ensemble.
p. m.—Reduction Day Orchestra.
p. m.—Crescent Gardens Orch
vocal selections.
860k—WEEL—BOSTON—349m 869K.—WEET.—BOSTON.—349m (noon)—Keith's radio review. 45 p. m.—Culture talks. p. m.—Ernie Andrews's Troubadours. 50 p. m.—"Bees in Massachusetts." 15 p. m.—Eddie Diggs's Five Blac Aces

Aces.

45 p. m.—Stock market; news.

55 p. m.—Lost and found.

p. m.—Keith's radio review. 6:15 p. m.—George Joy, Nell Cantor, sor 6:45 p. m.—Big Brother Club. 7:30 p. m.—Minute Men. 8-11 p. m.—Frogram from WEAF. 7:30k—WEZ—SPRINGFIELD—333m

7:15 p. m.—Lenox Ensemble.
7:45 p. m.—Bob Patterson's Trio.
8 p. m.—Holyoke Hour.
9 p. m.—WBZ Movie Club.
10 p. m.—Ruth Terry, soprano; Spencer 7 barytone.

m.—Jimmie Buckner, comedian; 10:30 p. m.—Jimmie Buckner, comedian;
Tom Carson, piper; Lena Knox.
1120k—WTAG—WORCESTER—268m
10:30 a. m.—Musical selections; talk.
12:05-2 p. m.—Luncheon music.
7:45 p. m.—'Worcester Industry,'' Prof.
A. L. Smith.
8-8:30 p. m.—The Grand Prize Eurekas.
8:30-9 p. m.—To be announced.
9-11 p. m.—Program from WEAF.
640k—WRC—WASHINGTON—469m
1 p. m.—Organ recital.

12:05-2 p. m.—Luncheon music.
7:45 p. m.—'Worcester Industry," Prof.
A. L. Smith.
8-8:30 p. m.—The Grand Prize Eurekas.
8:30-9 p. m.—To be announced.
9-11 p. m.—Program from WEAF.
640k—WRC—WASHINGTON—469m
1 p. m.—Organ recital.
2 p. m.—Washington Orchestra.
8 p. m.—Radio School of International Relations.
8:30 p. m.—'Gems of Romance—The Sapphire.''
9 p. m.—Ice Cream Social.
10 p. m.—''The Grand Tour.''
10:30 p. m.—''The Grand Tour.''
10:30 p. m.—Weyer Davi's Syncopators.
11:30 p. m.—Weyer Davi's Syncopators.
1220k—WBAL—BALTIMORE—248m
7:30 p. m.—Erin's Masked Tenor.
1220k—WBAL—Sandman Circle.
830 p. m.—Erin's Masked Tenor.
840 p. m.—Erin's Masked Tenor.
850 p. m.—Erin's Masked Tenor.

conductor.

8:30 p. m.—WBAL Sandman Circle.

9 p. m.—Musical program by artists.

10 p. m.—WBAL Trio. Soloist: Alber Newcomb. tenor.

11 p. m.—WBAL Male Quartet.

11:30 p. m.—Organ program.

970k—KDKA—PITTSBURGH—461m

6:30 p. m.—Dinner concert.

7:20 p. m.—Daddy Winkum.

9 p. m.—Stockman-Farmer news.

8:15 p. m.—University of Pittsburgh address.

dress, —Sacred Song half hour, 10 p. m.—Grand Theatre, 20 chestra; Henrietta Hibbard, contralto, 11:35 p. m.—Grand Theater concert, 650k—WCAE—PITTSBURGH—461m 6:30 p. m.—Dinner concert. 8 p. m.—Program from WEAF. 11:05 p. m.—Kenyon Theater.

Dance Orchestras for This Week WLIT 395 WAAM 263 WAHG 319 WEEI 349 WJZ 455 WEAF 492 WJAR 306 WCAF 469 WEAF 492 WTIC 476 WFBH 273 WHAM 278

Carroll's
Arrowhead Inn
Dance music
W. S. Tupman's
Mayflower
Vincent Lopez
E. Golden's
Larry Siry's

Arcadia Osborne's Dance music Ed Andrews's Ed Andrews's
Lorraine Grill
Ben Bernie's
Biltmore
Dance music
Pelham Heath
E. Heimberger
Connie's Inn
Dance music SATURDAY, MAY 29 Ben Bernie's
St. George's
Bob Patterson's
Stauch's
Dance music
The Buffalodia
Ray Nichols
Dance music
Carroll's

10:15 p. m.—Coughlan announce 10:20 p. m.—News editor. 10:30 p. m.—Stauch's Orchestra. 11 p. m.—Musical program. 12 p. m.—McAlpin Entertainers.

7-10 p. m.—Central 1611.

590k—WIP—PHILADELPHIA—508m

1 p. m.—Organ recital

3 p. m.—'Where Are the Dead?'' G. S.
Calhoun.

3:15 p. m.—Velvetone Saxaphone Sextet.
6:05 p. m.—Monte Cross, "Oldtimer."
6:15 p. m.—Nat Martin's Orchestra,
7 p. m.—Roll call; birthday list; plano
solo.

11:30 a. m.—Music,
11:40 a. m.—'The Mental Daily Dozen,
11:30 a. m.—Music,
11:40 a. m.—'The Mental Daily Dozen,
11:40 a. m.—'Music,
11:40 a. m.—'The Mental Daily Dozen,
11:40 a. m.—'Music,

4:30 p. m.—Story hour. 4:45 p. m.—Myrtle Purdy, contralto. 6:55 p. m.—Scores.
7 p. m.—Synagogue services; Rabbi E.
Charles Sydney; Alex Compinsky, cellist.
7:30 p. m.—Emma Ray, planist.
7:45 p. m.—Virginia and Vere Richards, so-

Charles Sydney, Alex Compinsky, cellist.
7:340 p. m.—Emma Ray, pianist.
7:45 p. m.—Virginia and Vere Richards, sopprano, tenor duets.
8 p. m.—Iteroy Montesanto, tenor.
8 p. m.—Leroy Montesanto, tenor.
8 p. m.—Bob Neilson, Dick Robson.
8:25 p. m.—Berliner's Imperials.
8:25 p. m.—Heroy Reciter.
9:10 p. m.—Bob Denniker, songs.
9:10 p. m.—Razof, Denniker, songs.
9:30 p. m.—Lillian Flosbach.
9:45 p. m.—Bob Brandes, songs.
10 p. m.—Frank Gallasi, uke artist.
10:30 p. m.—Leroy Montesanto, tenor.
8:15 p. m.—Bob Brandes, songs.
10 p. m.—Frank Gallasi, uke artist.
10:30 p. m.—Leroy Montesanto, tenor.
8:15 p. m.—Bob Brandes, songs.
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8:15 p. m.—Bob Reciter.
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9:10 p. m.—Bob Brandes, songs.
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8:15 p. m.—Bob Brandes, songs.
10 p. m.—Frank Gallasi, uke artist.
10:30 p. m.—Leroy Montesanto, tenor.
8:15 p. m.—Bob Reciter.
9:10 p. m.—Bob Reciter.

660k-WJZ-NEW YORK-455m 660k—WJZ—NEW YORK—455m p. m.—Madison Concert Orchestra. p. m.—News service. 4:35, 7:30 p. m.—Baseball reports. 30, 5:30, 7:30, 1:30 p. m.—News service. p. m.—"Your Daily Menu," Mrs. Julian Heath. 7:40 p. m.—Vida Milholland, "Thy Will Be Done,"

p. m.—"Your Daily Menu," Mrs. Heath. 15 p. m.—Fashion talk. 25 p. m.—Health speakers' bureau 35 p. m.—Waldorf-Astoria tea cor 5:32 p. m.—Market quotations. 5:35 p. m.—Financial summary.

950k—WGBS—NEW YORK—316m 10 a. m.—Timely Talks With Terese. 10:10 a. m.—Woman's hour; Mercet Fehley, soprano.

7:10 p. m.—Fess Williams's Orchestra.

1100k—WFBH—NEW YORK—273m

2 p. m.—Black Dlamond Serenaders.

3 p. m.—Studio program.

3:15 p. m.—Jeanne A'Dair, songs.

3:30 p. m.—'The Hour of Meditation."

4 p. m.—Carl Jiencke, composer.

4:15 p. m.—Radio Ramblers.

4:30 p. m.—Bill Tracy, Danny Dougherty.

4:45 p. m.—Harry Kirsch, tenor.

5-45 p. m.—Interstate Orchestra.

5:45 p. m.—The Two Bills," Rockwell and Connors.

6 p. m.—Abbey Orchestra.

6 p. m.—Abbey Orchestra.

6 p. m.—Baauty Hints, Ervin Weiss.

7 p. m.—Hotel Majestic String Ensemble.

7 7:30 p. m.—Entertain—

p. m.—Hotel Majestic String Ensemble 30 p. m.—Castillian Royal Entertain :45 p. m.—Sleepy Hall's Orchestra. 1410k—WMSG—NEW YORK—210m 6 p. m.—Recording artists. 6:30 p. m.—Manufacturers' Trust Co

pany program. 7 p. m.—Sport talk, Marty Berg. 7 p. m.—Sport talk, Marty Berg. 8 p. m.—Stoadway Harmony Kings. 8 p. m.—S. S. Resolute tour. 9:15 p. m.—Marie Huston, soprano. 9:30 p. m.—Bobbie Adams, personali

plus. 9:45 p. m.—Ted Berger's Orchestra. 10:30 p. m.—S. S. Leviathan Orchestra. 1160k—WRNY—NEW YORK—258m 12 noon—Fred Osborne, songs. 12:15 p. m.—Pollock and Dorn, songs. 12:30 p. m.—Clifford Odets, reader.

12:15 p. m.—Pollock and Dorn, songs.
12:30 p. m.—Clifford Odets, reader.
12:45 p. m.—Studio artist.
7 p. m.—Sports.
7:10 p. m.—Commercial digest.
7:15 p. m.—Radio theater index.
7:30 p. m.—Norman Secon, pianist.
7:45 p. m.—American songstress.
8 p. m.—John Keltenegger, concertina.
8:15 p. m.—Charles Isaacson's concert. 1100k-WEBJ-NEW YORK-273m

11:30 p. m.—Roseiant Ballot.

11:30 p. m.—Silver Silpper Orchestra.

12 (midnight)—Dance Orchestra.

570k—WNYC—NEW YORK—526m
4:30 p. m.—Commonwealth Quartet.
5 p. m.—Organ recital.
6 p. m.—Gran recital.
6 p. m.—Gran recital.
6 p. m.—Plano recital, Herbert Newman.
6:20 p. m.—Plano recital, Herbert Newman.
6:30 p. m.—Elementary Spanish Lessons.
07-7 p. m.—Advanced Spanish Lessons.
17:35 p. m.—'Trend of the Times," Sydney
Ussher.
7:55 p. m.—Sylvia Meyers, violinist.
8 p. m.—Baseball results.
9:30 p. m.—Heiten Travis Root, sorpiano.
9:45 p. m.—Senator Hassenpfeffer.
10:50 p. m.—Autrice Patton, tenor; Harry Reudy, barytone.
10:30 p. m.—Carl Zoehrns, Lou Hirscher, songs.
10:45 p. m.—Frank Cook, songs.
10:45 p. m.—Frank Cook, songs.
10:45 p. m.—Frank Cook, songs.
10:45 p. m.—Estman Theater Orchestra.
10:30 p. m.—Eastman Theater Orchestra.
10:30 p. m.—Eastman Theater Orchestra.
10:30 p. m.—Concert by instrumental trio.
10:45 p. m.—Carl Zoehrns, Lou Hirscher, songs.
10:45 p. m.—Frank Cook, songs.
10:45 p. m.—Eastman Theater Orchestra.
10:30 p. m.—Dinner music.

8 p. m.—Baseball results.

8:05 p. m.—Sylvia Meyers, violinist.

8:05 p. m.—Sylvia Meyers, violinist.

8:10 p. m.—Raymond Maher, barytone

8:30 p. m.—"Robert Bridges," Prof.

Alex. DuP. Coleman.

8:50 p. m.—Frank U. Doyle, tenor.

9:10 p. m.—Kathleen Fisher, pianist.

9:30 p. m.—Harold Lieberman, violin.

10:30 p. m.—Police alarms; weather. 30 p. m.—Police alarms; weather. 1040k—WLWL—NEW YORK—288m p. m.—"Preparing for Business," by

K. of C.
9:15 p. m.—William J. Mullaly, concertina.
9:35 p. m.—A. Gargan, soprano.
9:45 p. m.—Concert.
10:15 p. m.—William Lawlor barytone.
10:40 p. m.—Rose Ensemble. 10:40 p. m.—Rose Ensemble.

880k—WMCA—NEW YORK—341m
10:15 a. m.—Employment opportunities.
10:30 a. m.—Market reports (hourly to 3:30 p. m.).
12:15 p. m.—Department of Agriculture.
12:30 p. m.—Olcott Vail's String Ensemble.
2 p. m.—Ralph Odierno, Cecile Arnold, duets.

p. m.—Raiph Odierno, Cecile Arnold, duets.
p. m.—Carl Smith, tenor.
15 p. m.—Lost and found department.
10 p. m.—Madame Polly.
15 p. m.—Employment opportunities.
145 p. m.—Employment opportunities.
15 p. m.—Employment opportunities.
16 p. m.—Ernie Golden's Orchestra.
17 p. m.—Employment opportunities.
18 p. m.—Employment opportunities.
19 p. m.—Ernie Golden's Orchestra.
19 p. m.—Talk by H. L. Stratton.
18 p. m.—Mable Groth, soprano.
19 p. m.—Mamaroneck night.
19 p. m.—Mamaroneck night.
19 p. m.—Woodmansten Orchestra.
19 p. m.—Woodmansten Orchestra.
19 p. m.—Coughlain announcement.

950k—WAHG—RICH. HILL—316m

12 noōn—Musical program.
7:30 p. m.—Margie Make-Believe.
7:45 p. m.—Margie Make-Believe.
8:15 p. m.—William Sweeney, barytone.
8:15 p. m.—'Trout Fishing." J. Mile Flynn.
8:30 p. m.—Louis Caton, tenor.
8:45 p. m.—Richard Delnunzio, violinist.
9:15 p. m.—Old-Fashioned Quartet; Alber Reiss, soloist.
10 p. m.—Cliff Ulrich, Ray Sinnott.
10:20 p. m.—Long Island Blue Bells.
1230k—WGBB—FREEPORT—2244m
8 p. m.—Sidney Faulhaber, violinist.

8 p. m.—Sidney Faulhaber, violinist.
8:15 p. m.—Marion Triebswetter, sopran.
8:30 p. m.—Mary McMahon, pianist.
8:45 p. m.—Hazel Rogers, soprano.
9 p. m.—Harlnedy Jr. Duo.
9:15 p. m.—Revelers.
9:45 p. m.—Gillies-Cornell recital.
10 p. m.—Jolly Frolickers Dance Orchestry.
14894—WRNV\_NEW\_YORK\_210\*\*

1430k-WBNY-NEW YORK-210m

8 p. m.—WHAP Madrigal singers.
8 p. m.—Franklin Ford, news digest.
8:15 p. m.—Franklin Ford, news digest.
6:35 p. m.—John Warren Erb, pianist;
Christian Thaulow, violinist;
Falmer, tenor.
9:10 p. m.—Hickman Price, speaker.
9:30 p. m.—Augusta Stetson, reading.
10:15 p. m.—WHAP chorus of men and
artists recital.

1190k-WNJ-NEWARK-252m 6:55 p. m.—Market reports, scores. 8:20 p. m.—Lion's Club banquet.

p. m.—Dreamland's Memphis Five 1190k—WGCP—NEWARK—252n m.—Hiawatha Country Club O 7:30 p. m.—"Glimpses Through the Stage Door."

8 p. m.—Seaside Trio.

1000k—WPG—ATLANTIC CITY—300m
1:30 p. m.—Luncheon music.
6:45 p. m.—Organ recital.
7 p. m.—Dinner music.
8:30 p. m.—Fashion flashes.
8 p. m.—Plaza artifsts.
8:30 p. m.—Standard music concert program.
9 p. m.—Chalfonte-Haddon Hall dual trio.
10 p. m.—Dance orchestra.
10:30 p. m.—Donace orchestra.
11 p. m.—McKnight's dance orchestra.
11 p. m.—McKnight's dance orchestra.
10:30 p. m.—Eastman Theater organ.
8 p. m.—Dinner music.
9 p. m.—Eastman Theater organ.
10 p. m.—Seaside Trio.
11 p. m.—McKnight's dance orchestra.
10:00k—WHAM—ROCHESTER—278m
4:30 p. m.—Eastman Theater organ.
6 p. m.—Uncle Geebee.
130 p. m.—Dinner concert.
9 p. m.—Dinner concert.
11 a. m.—Home economics talk.
11 a. m.—Home economics talk.
12 p. m.—Dinner music.
13 p. m.—Janne Winters, soprano.
14 p. m.—Black Diamond Serenaders.
15 p. m.—Gralliam L. Love, "The Nursing Situation."
11 a. m.—Home economics talk.
11 p. m.—Dinner music.
12 p. m.—Black Diamond Serenaders.
13 p. m.—Horace Taylor, reader.
14 p. m.—Black Diamond Serenaders.
25 p. m.—Balin and Race, plano duo.
27 p. m.—Studio Program.
28 p. m.—Plarey William's Orchestra.
29 p. m.—Blanck Diamond Serenaders.
29 p. m.—Gralliam L. Love, "The Nursing Situation."
21 p. m.—Blanck Diamond Serenaders.
28 p. m.—Plarey Work—273m p. m.—William Lockwood, violinist.
29 p. m.—Black Diamond Serenaders.
20 p. m.—Studio Program.
21 p. m.—Horace Taylor, reader.
21 p. m.—Studio Program.
21 p. m.—Horace Taylor, reader.
22 p. m.—Studio Program.
23 p. m.—Horace Taylor, reader.
24 p. m.—Studio Program.
25 p. m.—Studio Program.
26 p. m.—Studio Program.
27 p. m.—Carl Jieneke, composer.
28 p. m.—Radio Ramblers.
29 p. m.—Blanck Dhomes concert.
30 p. m.—Carl Jieneke, composer.
31 p. m.—Studio Program.
31 p. m.—William L. Love, "The Nursing Situation."
31 p. m.—Horace Taylor, reader.
31 p. m.—Horace Taylor, reader.
31 p. m.—Horace Taylor, reader.
31 p. m.—Black Diamond Serenaders.
31 p. m.—Horace Governor A. Harry Moore, speaker, Jersey City Othember of

tenor.
11 p. M.—News bulletin.
11:05 p. m.—Premier Orchestra.
1140k—WAAM—NEWARK—263m 1 140k—WAAM—NEWARK—263m
1 p. m.—Happy Hour program.
p. m.—Melodyland Orchestra.
p. m.—Sport review, Major Tate.
10 p. m.—Wallie Osborne's Orchestra.
45 p. m.—Mildred Blessing, soprano.
p. m.—Busy Beavers.
p. m.—Sylvia Greenberg, soprano.
115 p. m.—Cash Credit Hour.
0 p. m.—Bill McWalters, songs.
1340k—WODA—PATERSON—224m
100n—Dance musjc.

p. m.—Musicale, 30 p. m.—News; sport talk, p. m.—News; sport talk, p. m.—Pat Christello's Dance Orchestra 1390k—WRST—BAYSHORE—216m p. m.—Jack Watson's Orchestra, 5 p. m.—Dr. Rundback, optometrist, 9:30 p. m.—Dance orchestra.

45 p. m.—Dr. Rundback, optometrist.
9:30 p. m.—Dance orchestra.
590k—WOO—PHILADELPHIA—508m

a. m.—Grand organ.

cut of the control organ and trumpets.
30 p. m.—Dinner dance music.

p. m.—Program from WEAF.

p. m.—Fox Theater studio program.

130 p. m.—Dance music. 30 p. m.—Dance music, 590k—WIP—PHILADELPHIA—508m

p. m.— Robbes and Vacations," Fred erick Leavitt.

105 p. m.—Dinner music.

105 p. m.—Roll call, birthday list; songs.

1060k—WLIT—PHILADELPHIA—395m 12 p. m.—Organ recital.
22 p. m.—Religious service.
2 p. m.—Arcadia Concert Orchestra.
4:35 p. m.—Talk; artist recital.
7:30 p. m.—Dream Daddy.
8 p. m.—Advertising Convention
Festival.

1 p. m.—Tea room ensemble.
1:40 p. m.—Tea room ensemble.
3 p. m.—Readings by Florence Huet apupils; brass quartet; solos.
330 p. m.—Robert Atwood, cellist.
6:30 p. m.—Concert orchestra.
7 p. m.—Dance orchestra.

la, 8:15 p. m.—Eva Rothernberg, planist, 8:30 p. m.—Lyran Singing Society—Swedish Gelle Club and Swea Singing Society—Swedish Gelle Club and Swea Singing Society—Swedish Gelle Club and Swea Singing Society—The Club and Sweap American Action of the Club and Sweap American Action of the Club and Sweap American Action of the Club and Sweap America

6:30 p. m.—Dinner music.
8 p. m.—Shinola Merrymakers and the
Gentleman of the 2 in 1.
8:30 p. m.—"The Day of Respect and Reverence." erence."
8:45 p. m.—"The Stock Swindler," Donald Dudley. 9 p. m.—Ipana Troubadours.
10 p. m.—"The Hour of Kings."
y11-12 midnight—Colonial Entertainers Or

y 11-12 midnight—Colonial Entertainers Or chestra.

1130k—WMAK—BUFFALO—266m
6:30 to 7:15 p. m.—Dinner music.
7:30 to 8:30 p. m.—Dinner music.
8:30 p. m.—Eastman Theater Orchestra.
9:05 p. m.—Musical.
980k—WJAR—PROVIDENCE—306
10:45 a. m.—Home Service Department.
10:105 p. m.—Al Billincoff's Orchestra.
7:30 p. m.—Chamber musicale.
8 p. m.—Davis Saxophone Octet.
9 p. m.—Musical program.
10 p. m.—Tabloid musicale.
6:30 p. m.—Tabloid musicale.
6:30 p. m.—Tabloid musicale.

6:30k-WTIC-HARTFORD-476m
6:30 p. m.—Bond Trio.
8 p. m.—Dan Nolan's Ukulele Lesson.
8 p. m.—Lan Nolan's Ukulele Lesson.
8:15 p. m.—Alice Salavalcik, soprano; Anna
Kaskes, contralic.
9:45 p. m.—Elsie Palmer, violinist.
9:30 p. m.—Nina Woodbury, cellist.
9:45 p. m.—Capitol Theater Orchestra.
10:45 p. m.—American Legion banquet.
860k-WEEL-BOSTON-349m
12 noon-Keith's Radio Review 860k—WEEI—BOSTON—349m
12 noon—Keith's Radio Review.
12:45 p. m.—Market report.
3:10 p. m.—Women's Relief Corps program.
4:10 p. m.—Red Top Serenaders.
5:45 p. m.—Stock market news.
6 p. m.—Keith's Radio Review.
6:20 p. m.—Joe Rines's Orchestra.
6:45 p. m.—Big Brother Club.
7:30 n. m.—Musicale.

17:30 p. m.—Musicale, 18-11 p. m.—Program from WEAP,

1070k-WNAC-BOSTON-280m

4 p. m.—Puncheon concert.
5 p. m.—Perley Stevens's Orchestra.
6 p. m.—Extracy Kat Kiddles Klub.
6:30 p. m.—Dinner Dance.
7:35 p. m.—Greater Boston Federation of Churches.
8 p. m.—The Hearthside Harmonizers.
8:30 p. m.—One-Act Play, WNAC players.
8:50 p. m.—American Order Sons of St.
George. George. p. m.—Dance music; popular selections. 900k-WBZ-SPRINGFIELD-333m

7 p. m.—"Jolly Half Hour With the Musical Mirth Makers."
7:45 p. m.—M. A. C. Radio Forum.
8 p. m.—Fifth play by the Little Screen
Players, "An Interrupted Proposal."
8:30 p. m.—Radio Nature League.
9 p. m.—WBZ Concert Ensemble.
10 p. m.—Mrs. Philip Simons, contraits.
10:15 p. m.—Leon Hatton, ukulele.
10:30 p. m.—Worthy Wood, cornet. 1120k—WTAG—WORCESTER—268ma
10:30 a. m.—Musical selections; talk.
12:05-2 p. m.—Luncheon music.
7 p. m.—Astronomy talk, Fred Aldrich,
7:15 p. m.—"Story Teller."
8-8:30 p. m.—Shinola Merrymakers.
8:30 p. m.—To be announced 30 p. m.—To be announced. 11 p. m.—Light opera. 640k-WCAP-WASHINGTON-469m

45-7:45 a. m.—Tower health exercises. 30 p. m.—'Matters Before the House." p. m.—The Shinola Merrymakers. p. m.—Davis's Saxophone Quartet.
m:—Ipana Troubadours.
b. m.—WEAF light opera company. 640k-WRC-WASHINGTON-469m m.—Organ recital.
m.—Irving Boernstein's Orchestra,
m.—United States Navy Band.
m.—"Housekeepers' Chat," Dorothy

:20 p. m .- Musical program 970k-KDKA-PITTSBURGH-461m 6:30 p. m.—Dinner concert.
7:20 p. m.—The KDKA mallbox.
9 p. m.—Stockman-Farmer news.
9:15 p. m.—University of Pittsburgh ad-30 p. m.—Marion Selee, soprano; Esther

Mullen, violin. 650k—WCAE—PITTSBURGH—461m 6:30 p. m.—Dinner concert.

8 p. m.—Program from WEAF.

9 p. m.—Kramer's Orchestra.

10 p. m.—Musical comedy from WEAF.

THURSDAY

610k-WEAF-NEW YORK-492m 610k—WEAF—NEW YORK—492m 6:45, 7, 7:20 a. m.—Health exercises, 7:45-8 a. m.—Prayer services. 11 a. m.—Elaine Horton, contraito. 11:10 a. m.—Talk on "Fish." 11:20 a. m.—'Mayfair Extension Talk." 11:30 a. m.—Contraito. 11:40 a. m.—Talk. 4 p. m.—Hilda Kay, contraito. 4:15 p. m.—Loris Gratke, violinist. 4:30 p. m.—Sarino and Ruty, Hawaiian guitars.

guitars. —Talk.
5 p. m.—Talk.
5 p. m.—Diandance music.
6 p. m.—Dinner music.
6 p. m.—Scores.
7 p. m.—Mid-week hymn sing. 7 p. m.—Mid-week hymn sing.
7:30 p. m.—Forest Hills Ensemble.
8 p. m.—"What's a Good Book to Read,"
Thomas Masson.
8:15 p. m.—"Hires Harvesters."
9 p. m.—"Cliquot Club Eskimos."
10 p. m.—"Silvertown Cord Orchestra."
11-12 p. m.—Vincent Lopez's Orchestra.

660k-WJZ-NEW YORK-455m

660k—WJZ—NEW YORK—455m

1 p. m.—Pennsylvania luncheon musio.
2 p. m.—Weather; news.
4:30, 5:30, 7:30, 10:30 p. m.—News service
4, 4:35, 7:30 p. m.—Baseball reports.
4 p. m.—'Your Daily Menu."
4:15 p. m.—'Wall Paper Room by Room."
4:25 p. m.—Dr. Johnson "Textiles and Fabrics."
4:35 p. m.—Commodore tea music.
5:32 p. m.—Commodore tea music.
5:32 p. m.—Market quotations.
5:35 p. m.—Financial summary.
5:40 p. m.—Cotton quotations.
5:50 p. m.—Farm market reports.
7 p. m.—Vanderbilt Orchestra.
7:30 p. m.—Judge jr.
8 p. m.—'Voice of the Silent Drama,"
"Ella Cinders."
8:30 p. m.—U. S. Marine Band.
9:30 p. m.—U. S. Marine Band.
10:30 p. m.—Erectallo Richly Corchestra.

chestra. 10:30 p. m.—Freddie Rich's Orchestra. 950k-WGBS-NEW YORK-316m

950k—WGBS—NEW YORK—316m

10 a. m.—Timely talks with Terese.
10:10 a. m.—June Warren, pianist.
10:15 a. m.—Radio gym class; piano solos
10:35 a. m.—Better homes and gardens.
1:30 p. m.—Scripture reading.
1:35 p. m.—Manhattan String Trio.
8-4 p. m.—Woman in the Home Hour;
Gita Rapoch, soprano; Michel Borocksowsky, pianist.
6 p. m.—Uncle Geebee.
6:30 p. m.—Music.
6:35 p. m.—The Independent "What the World is Doing."
6:45 p. m.—Geo. Hall's Arcadians.
7:45 p. m.—Lacey Coe Violin Studio program.

gram.—"Footlight and Lamplight."
8:30 p. m.—"Footlight and Lamplight."
9-10:30 p. m.—Kuban Cossack Chorus
Louis Gershenson's Orchestra,
10:30 p. m.—Emo's Movie Broadcast,
10:45 p. m.—LouisGershenson'sOrchestra 10:45 p. m.—LouisGershenson'sOrchestrs

830k—WHN—NEW YORK—361m

12:30-1 p. m.—Loew's organ recital.

3:20-5 p. m.—Loew's Lexington Orche
tra; news and sports.

5:10 p. m.—Al Rossbach, barytone.

5:25 p. m.—News and sports.

7 p. m.—National Junior Order Night.

7:30 n. m.—Leonard Seyon.

7 p. m.—National Junior Order 17:30 p. m.—Leonard Sexon.
7:30 p. m.—Health talk, Dr. Percival.
7:45 p. m.—Health talk, Dr. Chatheau. 7:45 p. m.—Health talk, Dr. Percival.

8 p. m.—Will Oakland's Chatheau.

8 30 p. m.—Loew's Gates Theater Orchestra.

9 p. m.—Carl Smith, tenor.

9:10 p. m.—Madelyne Hardy, planist.

9:20 p. m.—Philip Krumholtz, barytone,

9:30 p. m.—Loew's Orchestra.

10 p. m.—Roy Raifsnider, barytone.

10:15 p. m.—Poems by NTG.

10:30 p. m.—Leroy Smith's Orchestra.

11:30 p. m.—Everglades Orchestra.

11:30 midnight—Sophie Tucker's Playground

570k—WNYC—NEW YORK—SSEM

12 midnight—Sophie Lucker S Liaygrow 570k—WNYC—NEW YORK—526m 6 p. m.—'Keeping Fit.' Joe Ruddy, 6:10 p. m.—Herman Neuman, pianist, 6:30 p. m.—'Coleridge and Hamlet.' P

6:10 p. m.—Herman Neuman, pianist.
6:30 p. m.—(Coleridge and Hamlet." Prof.
Lewis Mott.
6:50 p. m.—Market high spots.
7 p. m.—Robert Pascocello, Lester Place,
plano duo.
7:15 p. m.—'New York's Parks." Francis
D. Gallatin.
7:35 p. m.—Police alarms.
7:35 p. m.—Resume of meeting of Board
of Estimate.
8 p. m.—Baseball results.
8:05 p. m.—Acolian Waldon, soprano.
8:30 p. m.—Acolian Waldon, soprano.
8:30 p. m.—Bar Association of City of
New York; "Interest With Particular
Reference to Banks."
9:30 p. m.—Orchestra selections.
10:30 p. m.—Police alarms; weather forecasts.

1100k—WFBH—NEW YORK—273m 2 p. m.—Joe Capello's Sunnyside Orches

2 p. m.—Joe Capello's Sunnyside Orchestra.

3 p. m.—Studio program.

3:30 p. m.—Ed Mullen, violin recital.

3:35 p. m.—Bob Schaeffer, songs.

4 p. m. Radioviews, Mrs. Owen Kildare.

4:10 p. m.—Mme. Herta Groskoff, soprano.

4:15 p. m.—Maurice Block, violinist.

4:20 p. m.—Evelyn Seefs, planiste.

4:30 p. m.—Evelyn Seefs, planiste.

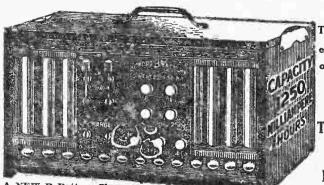
4:30 p. m.—Oon Stinson, songs.

5:15 p. m.—Monroe Fleck's dance orchestra.

tra.
6 p. m.—Dotty McLean, Leo Ford.
6:15 p. m.—Automobile route, H. K Maples.
6:30 p. m.—Majestic String Ensemble.
7 p. m.—Yorkville Radio Entertainers.
11:30 p. m.—Castilian Royal Entertainers.

11:45 p. m.—Sleepy Hall's Orchestra. (Continued on next page)

The Todd "B" Battery AIR-KING



he Queen of "B" Batteries

THE ORIGINAL "B" BATTERY WITH A NATIONAL REPUTATION

100% Efficient-Safe-Rechargeable THE TODD ELECTRIC CO., Inc.

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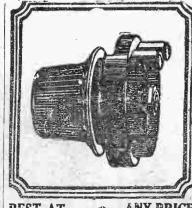


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Insist upon MODERN Transformers. They are made in three types—the Ten to One, the Push-Pull, and the BEST AT

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THE MOST WONDERFUL COIL IN RADIO'S HISTORY Coast to Coast Reception With an Ambassador Coil The Coil That Makes the

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EASILY BUILT

This Coil in any hook-up always lends itself to a very simple arrangement of parts which makes the set extremely easy to build. Ruggedness is a characteristic which is always present and even though the set shown here, as built by an amateur, contains the parts of only well known manufacturers, its first cost is low. Besides, the upkeep, which depends on the number of tubes, is small, for three tubes are all that you require.

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Mr. R. D. Montgomery, 33 Lamberts Lane, Port Richmond, S. I., entertained four radio engineers at his home with concerts from KHJ and PWX on a loud speaker using only three tubes. This Coil gives the volume of a single circuit, at the same time eliminating radiation. A step of Radio Frequency is unnecessary with this all Litzendraht Tuner because locals can be brought has been obtained.

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- Finished in a rich ebony, set off by a glistening silvered rim on the bell.

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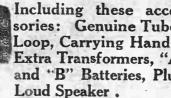
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DON'T WAIT till prices go sky high in September. Now is the time to buy. This genuine De Forest for \$89 is a remarkable value. The Famous Genuine

DE FOREST D-10 Portable \$ 20



Including these accessories: Genuine Tubes Loop, Carrying Handle, Extra Transformers, "A' and "B" Batteries, Plug,

# THE NEW YORK HERALD Nemborksissearinne

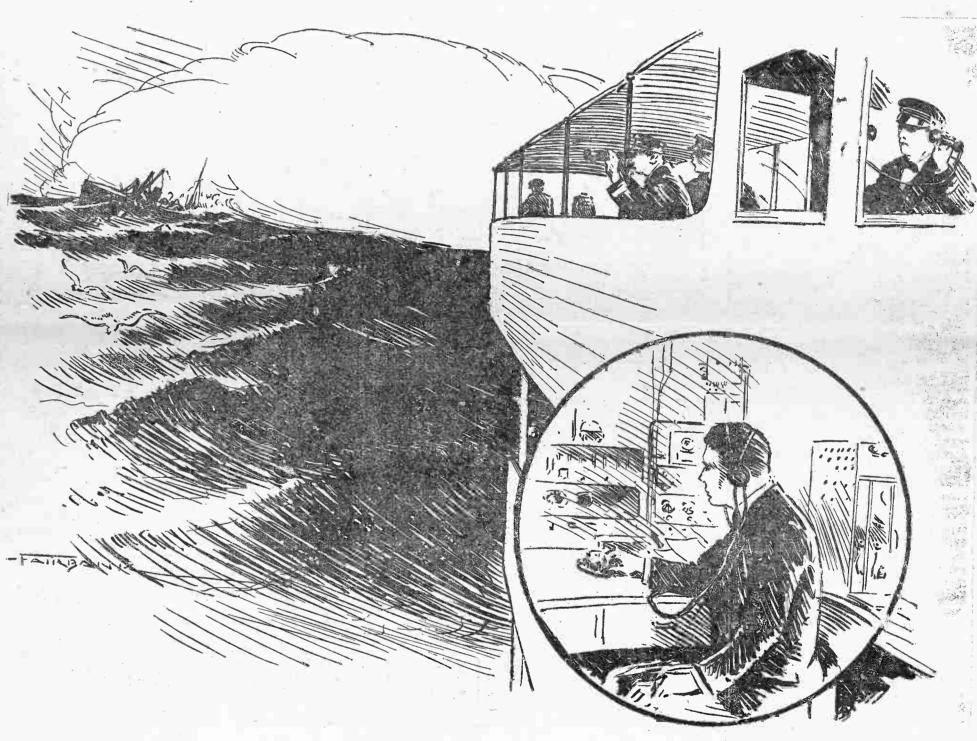
SECTION NINE

SUNDAY, JULY 27, 1924

# Radio Traces Course of Sea Derelicts

Hydrographic Office Broadcasts by Radio Positions of Floating Wrecks and Icebergs Dangerous to Navigation and Indicates Their Probable Drift

By MAURICE ROSENWALD



TNLESS a man has been to sea the | Office by radio. The Hydrographic Of- | derelict destroyers, they are of little use | ice that may lie in the path of the regnews of the abandoning of a lumber schooner by its crew during a storm means very little—that is, except where there has been loss of life. Then the average newspaper reader perhaps will turn to some one and remark something about how terrible it must be to have to abandon a ship that is sinking in midocean, and then he promptly forgets all about it. And so it was with the fourmasted lumber schooner Governor Parr, which was abandoned off the coast of Nova Scotia last October.

But the work of the United States Hydrographic Office, which is under the direction of the Secretary of the Navy, had just started, so far as the Governor Parr was concerned. From the day of its desertion by its crew the derelict schooner's progress has been followed by radio broadcasts almost daily, the latest report coming the other day from the Ballin, which sighted the derelict over halfway across and notified the Hydrographic | While the Hydrographic Office has two | whereabouts of the ice, particularly that

sage, and in addition published it in its | and the only thing that can be done is to daly bulletin, and then in its weekly bul- | follow the course of the derelict ship and letin, and then followed that up with a chart showing the course that the derelict had taken and its tendency to drift to the eastward. The Ballin's message stated that the

four-masted derelict schooner Governor Parr, masts gone, stern and bulwark partly smashed, deck house standing, and deck awash but apparently intact, was passed in latitude 45:20 north and longitude 17 degrees west. Every vessel that sights the lumber-laden derelict sends the same sort of message and in this way other vessels can keep clear of the derelict.

In other days, and not so long ago at that, shipmasters had to depend on the reports as they were made by the captains of the various vessels as they made port. These in turn were made up in pamphlet form by the Hydrographic Office and issued free to all vessels. But, in | erly, easterly and westerly limits of the any case, the derelict or other obstruction would have drifted a week before any fur- fields as they move to the southward, and ther notice would have been received. to send daily radio messages as to the

warn vessels of its probable track. Lumber schooners, like everything else, disintegrate in time, and when once the vessal sinks below the surface of the water it goes direct to the bottom. At one time there was a belief that waterlogged vessels floated ten or twelve feet below the surface, but that belief has been dispelled.

Directly after the horrible Titanic disaster in 1912 the International Ice Observation and Ice Patrol Service, provided for by the International Convention for the Safety of Life at Sea, called for the patrol of the North Atlantic trade routes during the months of March, April, May, June and as much longer as necessary. This year the United States Coast Guard Cutters Tampa and Modoc have been detailed for that service.

Their duties are to determine the southice fields and to keep in touch with these

fice immediately broadcast the mes- in the case of lumber laden schooners, ular North Atlantic lane. The following is the regular daily routine of the coast guard ships:

(a) At 6 a. m. and 6 p. m. (75th meridian time), ice information is sent broadcast for the benefit of vessels using 600-meter wave length (spark). This message is sent three times, with an interval of two minutes between each.

Broadcasts by spark will be eliminated as soon as possible, and vessels have been advised to equip themselves with C. W.

(b) At 7 a. m. and 7 p. m. (75th meridian time), ice information is broadcast by radio on 1,621 meters (185 kilocycles), C. W. These broadcasts are sent three times, with an interval of two minutes betwen each.

(c) At 8 p. m. (75th meridian time), a radiogram is sent to the Hydrographic Office, Washington, D. C., through the nearest land radio stations, defining the ice danger zone, its southern limits, or other definite ice news, while other mes-

. Continued on page four

# A Highly Efficient Two-Tube Portable Regenerative Receiver

The Receiver May Easily Be Carried in an Automobile

By GEORGE M. MEYER

UTDOOR radio is now in full swing. | a pencil to form a spring effect allowing | long way in avoiding body capacity for | No matter where you go on a vaca- for stretching when the cover was moved. tion you will find some one operating a receiving set. One gets a good thrill from radio while sitting before a receiving set and listening during the dark, lonesome nights spent out in the little bungalow between the high hills away from the din and racket of the city. The automobilist on a week-end trip finds radio an interesting pastime when he sits in his car and listens in to the programs from the town he left several hours before. Every one may keep posted on the events at home by listening in an hour or so each evening after the day's frolic in the open.

Various sets which have heretofore been discussed have their advantages and disadvantages as applied to portable work. When you are going more than forty miles from home and expect to listen in on the "ether wavelets" from afar don't expect to operate a loud speaker unless you have a complete set similar to the one used at home with three or more tubes and a long aerial. Receiving conditions are entirely different away from home when the set is located up in the mountains or at the seashore. Stations you hear at home do not come in with the same intensity thirty or forty miles away. Perhaps some of them cannot be heard at all at that distance. This has surprised many summer campers. Other stations which may have been very weak come in with great strength, while others fade badly. Nevertheless it is all a very interesting pastime and the receiving set should be included in the vacationist's luggage.

#### The Writer's Portable

In designing the receiving set about to be described the writer picked out the standard single-circuit hook-up, as it was simple to operate, gives maximum signal strength and employs light and compact apparatus. When this circuit is properly constructed and the correct coupler and condenser used the selectivity is nearly equal to the standard three-circuit tuner. One of the advantages of this circuit lies in the ability of the set to work with an extremely short antenna.

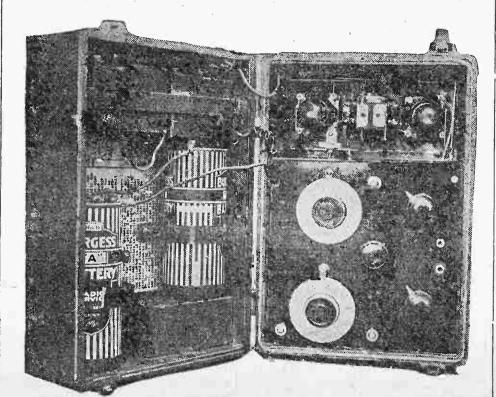
As the portable outfit was designed with the purpose of using it a number of miles away from the high-powered stations, the broadness of tuning is not evident. Of course, the further away we get from the transmitter the sharper the tuning. The receiving set was also designed to take care of batteries, both A and B. It was made rather small, so that it would fit closely in the rear of the automobile. where it was out of the way until wanted. The cabinet in which the writer's set was constructed formerly housed an army costly. Almost every radio fan of a few many turns on the tickler coil, and the crystal set, type BC 14-A. The works of months' standing has the apparatus on sesult is a loud, shrill squeal when operthe army set were entirely discarded as | nand to build such a receiver. The writer | ating. This of course, sets up squeals in new apparatus was used.

Thousands of these receiving sets have been disposed of by the army salvage department for a small sum. No doubt there are still many of these old sets in use which can be changed over to this twotube set. The reason for using the special box was on account of the fact that it was of sturdy construction and waterproof. It was built to withstand much "banging" around. It is for this reason that the builder of a similar set is advised to build a strong box if the set is to be taken from place to place. A narrow strip of soft rubber was imbedded around the walls of the box, so that when the lid closed it was moisture-proof. A heavy black iron carrying handle on the top of the lid made it convenient for carrying. In the lid of the outfit the A and B batteries were fastened by means of brass brackets which held the batteries in place. No matter which way the set was carried or operated, the batteries were securely fastened to prevent shifting. The batteries were connected to the circuit by means of covered lamp cord which had been stripped of its outer cotton covering for neater appearances. This wire is stranded and is very flexible. The wires were made a little long at first and then wound around

These little details are suggested for making the set foolproof and adaptable to all sorts of conditions. Looking down at the set, the tube compartment will be seen at the right. In this narrow opening are housed the two tubes with their sockets | Ir fact, this circuit when completed would and the amplifying transformer. The not screech and squeal in the least, and

which this circuit is noted when the ordinary cheap condenser is used.

The coupler selected was properly designed with a small rotar or tickler having only sufficient turns on the coil to cause regeneration without violent squeals. leads to the batteries and the four wires | regeneration would approach to maximum



to the set proper are carried through a | smoothly. With the proper grid leak it side partition in which a hole was cut. | would regenerate up to a peak noiselessly. There are four leads to the tuning apparatus, i. e., grid, plate filament and B battery positive

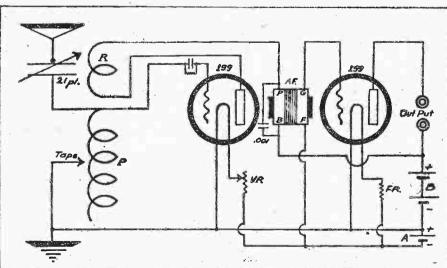
The main panel contains two tuning dials, a tap-control switch, rheostats, push-pull switch, aerial and ground post, and two receiver tip holders. The dial in the upper left corner controls the antenna series condenser, while the dial to the right is on the shaft of the tickler or plate coil. Indicators are fastened in the panel near the two dials. Underneath this panel are fastened the rheostats, tap switch, vario-ccupler and variable condenser. This is a very simple outfit, as can be seen by the apparatus required. For this reason it is extremely simple and easy to operate with its two dials and a rheostat adjustment. The grid condenser and leak are carefully mounted near the detector socket in the open compartment.

#### Selections of Parts

Owing to the simplicity of the single circuit receiver the parts required are not this writing. Most couplers have too

Mica condensers were chosen for the grid circuit and the phone circuit across the transformer primary. It was deemed not necessary to provide a detector jack. The low current consuming tubes warranted running both at once, thereby getting a step of audio amplification without excessive filament current. The coupler contained eighty turns on

the primary, wound on a thin 3%-inch. tube. Only three taps were taken off, and with one tap on the outside winding this made necessary a panel mounting tap switch with but four taps. These taps are all that are necessary with the antenna tuning condenser. It will cover the wave lengths efficiently without more taps. Losses occur in taps and switches, so it is best to limit them to the least number required to do a definite amount of tuning. The tickler coil was small, measuring but 1% inches in diameter. This seemed to be an ideal coupler for the circuit, and it can be purchased on the radio market at



was particular to get the best of parts | the sets listening in in the surrounding for the circuit, as the set was to be used neighborhood. Avoid using couplers with for accurate receiving data in remote localities and maximum reception was the goal. For this reason porcelain based sockets were used for the UV-199 tubes. A low loss condenser was selected in order to sharpen tuning. The condenser chosen had metal end plates which were connected to the antenna circuit, and went a

too many turns on the tickler. If the coupler you would like to use has a habit of squeating violently remove some of the turns on the rotar coil until it regenerates

Following is a list of the parts required in order to complete the outfit:

One good coupler 180-degree rotor.

One low loss variable condenser with One audio transformer (ratio 9 to 1 or

preferred).

Two rheostats, 30 ohm type.

One grid condenser with leak mounting. One grid leak, about 5 megohms.

Two small size B batteries. One cut-off switch.

Bus-bar wire, solder, etc.

main permanent, without further change.

#### Wiring the Circuit

The usual procedure of careful wiring is necessary in this circuit, some of which may be done with bus-bar wire, while a number of the leads will have to be flexible. The flexible leads may be made from lamp cord with the outer coating of braid stripped off to make the job neater and the wire more flexible. Some of the wiring, such as the tap leads and condenser connections, will be of bus-bar wire. Owing to the fact that the panel must be partly wired with loose flexible leads which will pass through the hole to the tubes, before the panel is put in place, several feet of lamp cord or other flexible wire will be required. Solder all connectings with extra large connections, as the outfit will probably get a few knocks around while

The batteries which are mounted in the lid of the box are fastened to the circuit by means of flexible lead wires long enough to avoid any pulling or strain when the lid of the box is opened.

#### Tuning In

There are two controls, one to get the station and the other to increase the volume. The antenna condenser worked in conjunction with the tap switch will cover the wave-length range from 150 meters to 600 meters. This makes a very flexible receiver for both amateur wave-lengths and the broadcasters. The tickler coil which is in the plate circuit controls the volume. In one direction the stations become stronger, while in the reverse direction they decrease in intensity. In working for DX stations it is best to work the tickler coil almost up to the point of oscillation and move the wave-length dial back and forth slowly. If the station comes in distorted reduce the regeneration slightly or reduce the filament temperature. On local reception for stations up to twentyfive miles distant it will not be necessary to run the filament temperature up or force the tickler circuit. The outfit constructed by the writer works a loud speaker on all of the local stations, with but forty-five volts of B battery.

metal and plates.

6 to 1). One tap switch (panel mounting type

Two porcelain base sockets for UV-199 or C-299.

One box for set with panel for apparatus. Two three-inch dials with indicators.

One phone condenser, .001

Two phone tip terminals. Two tubes (199 or 299). Two six-inch dry cells.

Two binding posts.

Above are the parts required in detail. Everything has been mentioned for the circuit. The cost should not exceed \$20 with the exception of the tubes. In the writer's set one rheostat having 30 ohms resistance is used. Two are shown on the set, but it was found that the amplifier and detector could be run from the same heostat without bad effects and hence the first rheostat was cut out. This also eliminated an extra wire run to the socket from the panel. The writer believes that a 20-ohm rheostat would be better for controlling the two tubes, as it now becomes necessary to move the rheostat slider almost all the way over before the tubes are working properly. It might be suggested here that, a fixed rheostat on the amplifier tube would serve nicely, puting the single rheostat on the detector tube by itself. This will be put in the set described in the near future, and will add to the simplicity of operation. The filament of the amplifier is not critical, and once adjusted the resistance will re-

### Radio News From the Capital of thanks to the commandant of the Ninth Naval District at Great Lakes,

Third Avenue Railway opens powerful broadcasting station to in-

struct public how to prevent accidents

lief from the long delay experienced in obtaining patents on their product by a movement just inaugurated by Secretary of the Interior Work. Secretary of the Interior Work Secretary Work has sent invitations to the presidents of the American Bar Association, American Patent Law Association, New York Patent Law Association, Chicago Patent Law Association, Chicago Patent Law Association, Chicago Patent Law Association in obtaining patents on their product by the Department of Commerce officials in obtaining patents on their product by the Department of Commerce of C Association, Chicago Patent Law Association, Cleveland Patent Law Association, Michigan Patent Law Association and Pittsburgh Patent Law Association, asking them each to Department of Commerce officials refused to comment on the complaints. But they made it quite clear that they considered themselves powderless to do anything in the matter.

While Secretary Hoover has an or cone-shaped diaphragms, Various Is in the development of the resident powder of the work of the plaints of the work of the past year has been done. Some types that they considered themselves powderless to do anything in the matter.

While Secretary Hoover has an or cone-shaped diaphragms, Various Is in the development of the resident powder of the work of the past year has been done. Some types have been developed with corrugated diaphragms, others with cup-shaped bury. Conn. Tested Edison elements 3c. Association, asking them each to While Secretary Hoover has an or cone-shaped diaphragms. Various nominate a member to serve on a nounced that he is opposed to radio kinds of material, such as aluminum, sommittee to simplify methods of censorship, radio officials of the Deof the Patent Office.

Perhaps the last people in the

world that a radio fan would ex-

pect to open a broadcasting sta-

tion would be a street railway

company, but nevertheless the

Third Avenue system of New York

City has completed a powerful

500-watt station of the highest

type, and is now on the air on a

273-meter wave length. Its call

letters are WEBJ. In addition to

to prevent str Lar accidents, it

will also broadcast the best of con-

certs. The entire station as built

by W. J. Quinn, chief electrical en-

gineer of the railroad, and his

The photographs show a corner

of the studio and one of the big

steel masts that support the aerial

The station's programs have been

arranged to include many popular fea-

tures of general interest as well as

safety talks. The names of several

new artists as well as those known

to the radio audience appear on the

and counterpoise.

CKadel & Herbert

have the committee after its organi- radio legislation assert a new radio zation make a thorough review of the law will be enacted at the coming Patent Office and to submit sugges- session of Congress which will give tions for changes in methods that the Secretary of Commerce authorshould result in bringing the work of the bureau to a current basis in the tion which broadcasts objectionable near future. Because of a remen- matter. dous increase in the patent business during the last few years the Patent | Dr. James Harris Rogers, father of

Patent Office 2,653 applications for ground broadcasting. patents on radio inventions. Some of Dr. Rogers's most recent invention of all the radio sets. No aerial, these applications are several years is a form of insulation which he be- no ground. old, while most of them are at least lieves will overcome the last obstacle Work the two simple knobs

S. Wilmington to the Navy Depart-

At 11:45 p. m. on June 28, while Pilot Jack Knight, of the Postoffice anchored at Put-In-Bay, the radio Air Mail Service, has won for himself operator on board the U. S. S. Wil- quite a reputation as a singer. The mington picked up fragments of radio Postoffice Department is experimentcalls which indicated that the cities ing at Omaha, Neb., in an effort to of Sandusky and Lorain had been dedevise a radio set satisfactory for stroved by a tornado. General mail airplanes. Pilot Knight is help-SOS calls were immediately sent ing with these experiments. Not long out by the radio operator of the ago he was in the air over Omaha Wilmington and quickly brought the testing a transmitting set. During the U. S. S. Dubuque to the scene of the test he sang "Old Gray Mare." Hun-

of Sandusky and Lorain with the far east as New Hampshire expressservices performed by the Dubuque ing appreciation for the song.

and Wilmington that Governor A. V. Donahey, of Ohio, addressed a letter design of the sets must be given part

merce against the character of horn. The most difficult problems

procedure and expedite the lus ess partment of Commerce believe he The plan of Secretary Work is to cent developments. Sponsors for

Office has been unable to keep up underground and undersea radio with the number of applications for communication, has just celebrated Don't take their word. Prove for patents that have been filed by the his seventy-fourth birthday. Dr. yourself right in your own home. Rogers is busily engaged in attempt-There are pending at present in the ing to devise a method of under- ing home demonstration of Radi-

that stands in the way of perfect yourself. Jump from distant city radio transmission. The wheel of Radio was the means of saving wires that he laid underneath Hyattsmany lives during the recent disas- ville, Md., during the war and through ter resulting from the tornado at which were picked up important Ger-Lorain and Candusky, Ohio, accord- man plans of action, is being reing to the report made of the incident by the Commander of the U.S. insulated with Dr. Rogers's product.

Mail Plane Pilot a Songster dreds of letters have been received So well satisfied were the citizens by the Postoffice Department from as

Improved Loud Speakers Aiding Reception

'he improvement in radio recepchief research engineer of C. Bran- province where "moose, deer and bear France.

laboratories of the members of this night while listening to your proearlier models, both as to power and past not fifty yards from our door. tone production. The consequences I had the pleasure of landing a threeof these developments are especially pound lake trout just before supper features. important for summertime radio, as to-night." atmospheric conditions during warm weather have in past years made loud Jewish Program From WEAF speaker reception frequently unsatis-

may be noticed particularly when one wife of the late Jewish scholar and listens to an organ recital, which, to professor, Dr. Israel Friedlaender, asmy mind, is the hardest sort of music sassinated four years ago while on a to reproduce successfully. Organ mission of mercy in Ukraine. The reception has been improved several subject of Mrs. Friedlaender's adhundred per cent over last year. In dress will be "Hebrew Education in fact, if one tunes in on an organ re- the Palestine," where she has been a cital during these hot summer resident since the unfortunate event months, and then tries to recall doing took place. such a thing last summer, one cannot help realizing and appreciating that loud speaker reception has greatly that there is nothing like the short improved. The main difficulty has wave lengths. He may be heard been with the lower notes, and when working both coasts with his lone these are reproduced without affect- 50-watt tube on 150 meters. This ing the tone of the extreme high station also has many remarkable notes, then indeed the perfect loud records to its credit. speaker has been designed. "Loud speakers of to-day are

great deal more sensitive than those of a year ago. Once it was believed that a loud speaker could function only with a set of very strong ampli fying power, but now it is frequently used with excellent results on two tube sets, and operated under favor able conditions by single tube receivers. However, improvements in the

From the Capital

of thanks to the commandant of the Ninth Naval District at Great Lakes, Illinois.

WASHINGTON, D. C.—Inventors of radio apparatus are promised relief from the long delay experienced lief from the long delay experienced of thanks to the commandant of the Ninth Naval District at Great Lakes, Illinois.

of the credit for this increased range of the loud speaker.

"It has been found that distortion in the loud speaker may be traced to Several protests have been received by the Department of Commerce against the character of horn. The most difficult problems of the credit for this increased range of the credit for this increased range of the loud speaker.

ONE hundred vôtes for the "HAWLEY" knock-down Rechargeable "B" storage battery. The only Edison element "B" storage battery sold on an unconditional guarantee or return of your money without any ifs nor ands. With the exception of elements, these knock-down in the loud speaker.

Several protests have been received by the Department of Commerce against the character of horn. The most difficult problems sole originator and pioneer of knock-down Rechargeable "B" storage battery. The only Edison element "B" storage battery sold on an uncondition in the loud speaker may be traced to the diaphragm and the air chamber immediately above it, leading to the merce against the character of large the condition of the credit for this increased range of the loud speaker.

ONE hundred vôtes for the "HAWLEY" have been relief to the loud speaker.

In the loud speaker was been relief to the loud speaker.

Several protests have been relief to the loud speaker.

The only factor of the loud speaker.

In the loud speaker was been relief to the loud speaker.

The only factor of the loud speaker was been relief to the loud speaker.

In the loud speaker was been relief to the loud speaker was been relief to the loud speaker.

The only factor of the loud speaker was been relief to the loud speaker.

The only factor of the loud speaker was been relief to the loud speaker.

### FREE PROOF

### Try the RADIOLA SUPER-HETERODYNE

in your own home

Best radio set? Radio engineers say SUPER-HETERODYNEgreatest distance, clearest tone. ola Super-Heterodyne, aristocrat

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SALES COMPANY, INC. BROADWAY AT 57TH STREET FISK BUILDING, NEW YORK

German silver and impregnated linen have been tested and adopted or retered in many different ways."

Radio Proves Itself To Be

are plentiful and we find the radio "After a year of painstaking re- the missing link between us and Brooklyn Distributors for search and experimentation in the civilization." Then read this: "Last organization, the majority of loud gram we heard a slight noise outside speakers now on the market repre- the camp and upon going outside sent a notable advance over the found that two moose had walked head, has been appointed Brooklyn

The Women's League of the United Synagogue of America will present "The better tone production of to WEAF's audience on Monday aftoud speakers of the latest design ernoon Mrs. Israel Friedlaender, the

9CA has come to the conclusion

TROUBLES?

GUARANTEED SERVICE

SUPER-HETERODYNES

Full line of tubes, parts

CHAS. DOWN,
321 West 44th St. New York City.
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RADIO specialist; batteries recharged, re-

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RADIO BATTERIES, special summer price, 120 ampere; U. S. L. batteries, THALER BATTERY SERVICE, N. Y. Distributors, 208 West 68th St. Columbus 1822.

Agents Wanted

Sets Built. Wired and Rep

Major Russell at WOR

Major C. E. Russell will tell one of jected. Finally, the mountings and clampings have been shifted and alpartment of Criminal Intelligence. namely "The Strange Adventures of Corporal MacPherson," in a talk Missing Link for Campers
Some of the letters received by a which he will broadcast from WOR previous seasons, which has been broadcasting station would arouse on Monday evening. Major Russell widely noted and commented upon, is envy in the heart of a sportsman. was connected with the Criminal Indue in no small degree to the better Bishop Brothers, of Ellshouse, Nova telligence Service of the United design and construction of loud Scotia, in a letter to WGY, recently, States army during the war. He was speakers. In a statement on this sub- complimented the station on its pro- stationed in France and his true ject prepared for the Radio Section gram and then explained that they stories of the actual experiences at of the Associated Manufacturers of are in a camp in the woods on one the front lay bare the story of the Electrical Supplies, C. E. Brigham, of the most beautiful lakes in the invisible powers behind the armies in

New Receiver Appointed The Brooklyn Radio Service Company, of which Ben Ginsberg is the distributors for the Ultradyne superheterodyne receiver, which, it is claimed, embodies some remarkable

17 JOHN STREET, NEW YORK THE COBURN DUO-FLEX

PUTS THE ARTIST IN YOUR HOME

Due to the superior design of the Giblin transformers used in this set, the quality of reproduction is truly remarkable. You can hardly believe it is radio Even in the store in the crowder lowntown district a demonstration will convince you. Come in and be actoniched

Price, complete with storage Price, complete with dry cells..

Radio Exchange Rate, 35 cents a line; minimum, 3 lines. Agate caps and white space only display permitted. Ads. accepted until 4 P. M. Friday.

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5-TUBE NEUTRODYNE. \$29.50

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1-TUBE JOURNAL 19.50

45 VOLT "B" batteries, LARGE. \$1.95

22½ VOLT/ all batteries/LARGE. 95

22½ VOLT/ are fresh —SMALL 50

"Special discount to dealers."

NEW TUBES, ALL TYPES, \$1.95.

EACH TUBE FULLY GUARANTEED

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Phones magnetized while you wait.
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Repair and install
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Sets built to your design; workmanship
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SPECIAL MONDAY
ASSEMBLE A SEE JAY RECHARGEABLE EDISON ELEMENT "B" BATTERY, 100 VOLTS, \$\$; 140 volts, \$11,
Genuine Edison elements, 6c. a pair; test
tubes, 3c. each; separators, 1c. each; pure
nickel wire. ½c. a length; chemicals, 20c.
a pound. Build a SEE JAY rechargable "B".

Battery. Batteries consists of full size
genuine Edison elements (not the small
size). Pure nickel wire; heavy glass
cells; hard rubber separators and imported potassium hydroxide.

SEE JAY.

915 Brook av., near 161st st. "L" Station.
Mail orders filled. Jerome 1739.
OPEN EVENINGS UNTIL 9 P. M.

SPECIAL MONDAY a pound.

SEE JAY.

915 Brook av., near 161st st. "L" Station.
Mail orders filled Jerome 1739.

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SPECIAL MONDAY

ONE HUNDRED VOLT UNIT KNOCKDOWN, \$8: 140-VOLT UNIT KNOCKDOWN, \$11; EDISON ELEMENTS, 6c,
A PAIR, GLASS CELLS, 3c, EACH;
SEPARATORS, 1c, EACH, PURE
NICKEL WIRE, 1½c A LENGTH, POTASSIUM HYDROXIDE, 2 POUND CAN,
50c, 100-VOLT MAHOGANY CABINET, \$5.

ADD THREE stages of RADIO FREQUENCY to your set. Radiola A. R.
made by Westinghouse especially for R.
C. set (wave lengths from 200 to 700 meters), will increase volume and bring in
distance on loud speaker. Can operate
with loop, Brand new, Full directions,
LIST \$80.00

EEPRAR PANCO CO. AM. "B" BATTERY WIRE
for building storage "B" batteries.
Genuine non-corrosive, size No. 20.
H. BOKER & CO., INC.,
101 Duane st., New York City. RETAIL EDISON Elements for "B" Batteries, EDISON Elements for B Batteries, for per pair.
All other parts in stock. Mail orders filled. ROMCO STORAGE BATTERY CO., 146 W. 68th St. Phone Columbus 1258.

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68 STATIONS ON CRYSTAL without tubes or batteries. You fellows who haven't tried my hook-up don't know what you are missing. Write LEON LAMBERT, 571 VOLUTSIA, WICHITA, KANSAS.

EDISON Elements for "B" Batteries, 6c. per pair. All other parts in stock. Mail orders filled. ROMCO STORAGE BATTERY CO. 146 W. 68th st. Phone Columbus 1252. RADIO representatives wanted for special work at convenient hours. Something good. Maitland Roach, 2905 Columbia Avc., Philadelphia, Penn.

ELECTRODYNE, five tubes, \$125; "execute pert-bilt" by Marconi assistant. Don's buy an apology set. 201 Jay Street. Brooklyn.

What Every Fan Should Know About Radio

Receiving Circuits

There Are Few Standard Circuits, but Many Variations

By SIDNEY ELBER

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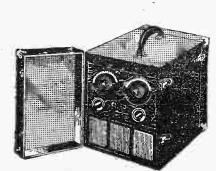


This is the famous Tuska No. 225, most powerful of all 3-tube sets. Complete with 3 Cunningham or R. C. A. tubes, 4 B batteries, storage battery, loud speaker and plug.

COMPLETE

# 1.25 weekly pays for this Ambassador

# CAMPFIRE Portable Set



\$89 Complete

Designed for use anywhere. Henry's career. Complete with 3 tubes, A and B batteries and built-in loud speaker. Batteries are contained in case and are connected by us. Nothing to bother with.

weekly pays for our vacation Ambassador Set

Complete with 3 tubes, A and B \$69 batteries and loud speaker

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\$5.00 O-T-3 Tubes . . . . . \$2.95 Same as 201A-6 volt. Beats them all by test! \$18.00 Presto-Light Storage Batt. \$10.95 \$15.00 Perfectone Loud Speaker ... \$7.95 \$7.50 Navy Head Sets . ... Now \$3.45

7x10 Cabinets (sanded, ready to stain) 95c 7x10 PANELS Composition . . . 29c

Every item in our store marked down—Don't miss this opportunity!

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LIBERTY STREET

If you want to buy, sell or exchange your ship which will be a feature of WEAF's program on Thursday afternoon, when to be used to control the filament of radio sets or parts the Radio Exchange will help you.

# The New Week on the Radio

last six months has risen from ob- on Monday afternoon. Mrs. Hammond James Millen-Please tell me how scurity to high rank as a modern citals, and her husband is one of dance orchestra, has been given an America's well known composers. He additional weekly period of broad- will accompany her on this occasion. same. Just lately I saw a circuit casting by Station WJZ, the Saturday tea-hour music now being a regular feature by that organization Covington, F. R. G. S., a WEAF pro-WJZ has been broadcasting the after- audience with a description of how cuit and the plate circuit tuned by theater dance music by Wolfe's Or- of the pyramids, the famous explorer is but a single circuit tuner. chestra every Tuesday night, and be- and archaeologist built a fire, the cause of the number of requests fuel for which was weirdly obtained from listeners who wanted to hear by opening the skull of an unimpor- is but a single circuit tuner, though the orchestra at an earlier hour as well as at the 11 o'clock period the Egyptians used a bituminous sub- is a two circuit tuner. To clear up Saturday afternoon tea-hour music stance in mummifying, which makes will be broadcast in addition to the the skulls burn evenly and give forth this subject we will explain the dif-

came to WEAF after W. W. Williams gave his talk on "The O. Henry I Knew," and there were so many requests that Mr. Williams give further information about his famous friend, that WEAF has persuaded the speaker to continue his interesting reminiscences of America's great story teller. Next Tuesday night, July 29, at 7:55 o'clock, Mr. Williams will radiate through WEAF what he calls "Close-ups of O. Henry." His talk will deal in the main with the author's early days in New York, one of the most interesting periods of O.

the entire company of "So This Is erlee. Miss Hendrickson was soloist Politics," now playing at Henry at the recent memorial services for

Many people far removed from Madison Square, New York City, will hear the exemplification of the in pressive "Mooseheart" pledge by the Loyal Order of Moose assembled in convention Wednesday evening, July 30. Station WJZ will broadcast the elaborate outdoor fete to be staged in Hayti, according to a report to the is the first time the famous pledge of the L. O. O. M. will have been heard by the radio audience. Com- and they easily pick up New York, mencing at 9 o'clock WJZ will broad- Pittsburgh and California. cvast the proceedings of the fete until 10:30, including the concerts by the prize-winning organizations of the glee club, quartet and Moose Band contests, as well as the New bethville, in the Belgian Congo. The tickler coil is very hard to adjust. York City Police Glee Club and the planes are equipped with radio sets. I am using 671/2 volts on the plate famous Boys' Military Band from Mooseheart, in addition to the ex-9 o'clock and the microphone will others will soon be erected. pick up and transmit their soft notes as well as the music of the bands.

The Women's League of the United Synagogue of America, will present were represented at the exhibition, to WEAF's audience on Monday after, which took up 2,000 square meters of o WEAF's audience on Monday afternoon Mrs. Israel Friedlaender, the floor space. The price of the sets, falling into oscillation as easily as it does now. Adding another stage of widow of the late Jewish scholar and which covered all varieties of receivprofessor, Dr. Israel Friedlaender, assassinated four years ago while on a pensive to the simplest and cheapest, mission of mercy in the Ukraine. The subject of Mrs. Friedlaender's ad- 15,000 people attended the exhibition. be noticed. Do not attempt the use dress will be "Hebrew Education in Palestine," where she has been a resident since the unfortunate event took place. Her address will be supplemented with a musical program consisting of piano solos by Sylvia D. government.

dividual wind instruments varies open air religious services which single tube regenerative receiver as is the result. The United States Maclear, vibrant voice which came from the Band, which is broadcast through the robin's throat not only attracted that stations below 400 meters cannot be received. How can the set best appreciate this by imagining by WCAP along with the religious tuning range of this set a small fixed the concert hail where the concert is and Virginia reported hearing the being played rather than as one of bird's voice. being played rather than as one of bird's voice. the radio audience in his home. Discriminating musicians have frequently remarked regarding the faithprogram on Monday evening.

A program featuring the composi- and several song numbers of the sistance of thirty ohms should be tions of William G. Hammond, with vintage of 1845 and 1924 respectively. used to control a UV-199 tube.

Roger Wolfe (Kahn's) Biltmore Sara Hammond, soprano, as soloist, Cascades Orchestra, which during the will be offered to WEAF'S audience is well known through her many re- to recognize a single circuit receiver

for WEAF's audience on July 28 Mr. cuit tuners. Covington will describe his ten years A ingle circuit tuner is any type So many commendatory letters of excavation in the pyramids.

> Miss Elsie Ahrens, who carried off the honors of the Music Week Conafternoon program at WEAF on Wednesday. She was especially recommended for her legato interpretation and professional mien. Some of her successful contest recital will be included in her WEAF program.

Following the dinner music program from the Waldorf-Astoria, under the direction of Joseph Knecht, A treat is in store for radio fans Florence Hendrickson, contralto, accompanied by Mme. Johanna L. Bayin concert throughout the metropoli-

# Radio News From

from fifteen to twenty sets in Hayti, two circuit tuners.

rated between Leopoldville and Eliza- ly falling into oscillation. The

The Danes are beginning to emplification ceremonies. As the wireless direction stations. One such radio frequency amplification with ceremonies are to commence, the bells station has already been erected at of the Metropolitan Tower will chime Gilleleje, and if it proves successful tector practical on a superdyne?

> The Germans have just concluded cuit? ranged from \$10 to \$300. Around

stallation of receiving or transmit-

To secure faithful reproduction of a tree near the peace cross in the feel that it would be inadvisable to large bands has always been a dif- Episcopal Cathedral grounds at do so. ficult problem for broadcasting ex- Mount St. Alban, Washington, D. C., perts. The volume produced by in- unconsciously took part in recent greatly. The work of each is impor- were being broadcast. As a result described in the Radio Magazine of tant to a harmonious whole; conse- the robin's warbling was heard by July 13. The set is one made by requently, if the microphone is not well thousands of people in the eastern modeling an old crystal set. The placed an unsatisfactory reproduction section of the United States. The receiver operates very well except Stations WEAF and WCAP, is one the attention of the congregation in be changed so as to bring in the lowof the best examples of such broad- the cathedral grounds, but went into wave stations? casting, and the radio listener can the microphones and was broadcast himself as one of the listeners at services. Radiophans in Maryland condenser (.00025 mfd.) may be

> 1845 Songs From WOR Miss Rosalind Fuller, ingenue of she will broadcast her radio debut a UV-199 tube? consisting of a chat on the drama | Answer-A rheostat having a re-

# JUESTIONSE/ ANSWERS

This Week's Most Interesting

Describing what he calls the best that was called a two circuit tuner, cup of tea he ever brewed, L. Dow a variometer was used to tune the through Station WJZ.. For a month gram feature, usually startles his grid filament aerial and ground cirhe concocted the drink. In the shadow a variometer. I feel sure that this

tant mummy and touching it with a it can be called a two circuit tuner lighted match. He explains that the and to the majority of radio fans it a very pleasant odor. In his lecture ference between single and two cir-

of circuit in which the aerial is conductively coupled to the grid circuit. No matter whether trick forms of untuned primaries are used, if they are directly coupled to the grid circuit test held at Erasmus Hall, Brooklyn, then the set is a single circuit tuner. recently, will be a feature of the To obtain regeneration in a single circuit tuner it is general practice to use a tickler coil, but, though a plate varicmeter is used it does not alter the fact that a circuit is single the numbers which she featured in circuit when the grid is directly connected to the aerial.

A two-circuit tuner is a tuner cuit is separate and distinct from the circuit having primary and second-WEAF offers on July 28 a program by ary circuits that are connected only by induction that circuit is a two circuit tuner. All circuits having a primary and secondary that are Miller's Theater, will journey to New- the late Professor Kayser, held at feed back are still but two circuit ark and broadcast one or two acts of Hunter College, and has been heard tuners, despite the fact that many manufacturers call them three circuit tuners, a three circuit tuner must have a tuned plate circuit along with a separate primary and secondary. And even then a three Foreign Lands circuit tuncr is only a three circuit tuner when the plate circuit must tion. Some tuned or so-called three at Madison Square that night. This Department of Commerce. There are quence are really nothing more than

> Superdyne Information Walter T. Lang-I have built a superdyne receiver and it operates very well except for the fact that A new air route has been inaugu- the radio frequency tube is constantof the radio frequency amplifier. Is Would it be advisable to incorporate regeneration in the detector tube cir-

their first radio exhibition at Ham-burg. More than 100 German firms Plate voltage on the radio frequency falling into oscillation as easily as it worthy of the additional parts would Another warning has been issued all constants would have to be in Poland, calling attention that in-changed to use such a detector. Reting radio sets is forbidden by the generation may be added to this set, but because of the difficulty that would be encountered in tuning the Robin Redbreast Broadcasts | set and because the increase in sig-A robin redbreast perched high in nal strength would be so slight we

M. Fishman-I have constructed the

the aerial and ground posts.

Rheostat Resistance Charles B. Sweeny-What resist-

bait is to fishing. When a

number of radio fans get to-

gether and begin boasting of their

achievements, the credit for any particu-

larly brilliant reception record is always

given to the circuit, and little or no men-

tion made of the individual parts that

comprised the set. This is only natural,

as it can safely be assumed that the per-

formance of mere parts is dependent en-

The average broadcast enthusiast prob-

ably thinks that there are circuits and

There are and there aren't, depending

on his understanding of the meaning of

the word. If he follows Webster's defini-

tion of "the path of the electric current."

a rather than any conglomeration of closed

wires in a "circuit," he will accept a "cir-

cuit" as being only a fundamental arrange-

ment, and he will be astonished at the

rapidity with which a large number of

our so-called "new circuits" fade into in-

significance. In the past, you know, the

crafty experimenter only had to make a

wire take three bends instead of two in a

diagram, and a gullible public immedi-

ately acclaimed his handiwork as the sen-

In an effort to make known the truth

about these "inventions," some of which

are downright fakes, the writer has pre-

pared a series of articles dealing with cir-

cuits of every kind and explaining how

they are twisted and distorted to form

hundreds of different variations. This

first article goes back to the simplest of

Fundamental Circuit

Fig. 1 shows a set that might almost

be called the ideal one, because it has

no controls. It uses only a crystal de-

tector, C, a pair of ear phones, P, and the

usual aerial and ground, A and G. Noth-

ing less complicated can possibly be made.

With such an outfit radio signals actually

can be heard, but they would be hopelessly

jumbled and probably very weak. If

all radio sets, the crystal receiver.

sation of the age.

tirely on how they are arranged.

circuits without number.

coil must be so made that the number of

By adding a coil of wire, TC, directly in series with the aerial, as in Fig. 2, the quality of selectivity is introduced. This turns in use can be varied at will, thus enabling the circuit to be adjusted, or "tuned," to different settings that will correspond to the wave length of different transmitting stations. This circuit is a

volume, selectivity or distance, but simply looked nice and lent a mysterious air to the set. It also showed that the circuit changer existed even then. The new slider merely provoked the aerial a bit, as

shown in Fig. 5.

The purpose of the sliders in the last four sets is to change the total amount cf wire in use, as explained, and this in turn tunes the set. Now, the same effect decidedly better one than that of Fig. 1. | can be secured by a different method. We now come to the first lesson in Two untapped coils can be taken, con-

circuit building. By taking the parts of Fig. 2 and merely changing the position of the tuning coil a different circuit is had. It is a slightly improved one, due to the fact that the crystal and phones have been removed from the direct path of the current flowing through the aerial. A small fixed condenser, F, has also been added to improve the tone quality. The tuning coil can consist merely of a hundred or so turns of insulated wire on a three or four inch tube, with a slider traveling across it over a bared section.

Progressing, we find that by fixing this same coil with a second slider, Fig. 4 can be drawn. The wiring has been changed to the extent of pushing the ground lead from the first slider to the second one. Little is gained by this move in the way of results, but the two sliders keep both hands busy if they do nothing else. Single and double slide crystal receivers were widely used seven and eight years ago.

One rainy evening during that period some bright individual must have had nothing to do, so he went and stuck even a third slider on the same single layer coil of wire to keep the other two comwithin the other. The resulting instrument is a "variometer" and works very picely in conjunction with a crystal de-

The circuit used is that of Fig. 6. This really has some claim to originality, for at least a different tuning device is employed. The crystal detector, fixed condenser and ear phones are, of course, inevitable. The variometer is shown as

A variometer crystal set makes a nice little outfit, as it is simplicity itself. Therefore, being simple, it can readily be made less so by applying a few tricks. For instance, the wire from the top side of the crystal detector, instead of going to the aerial and top of the variometer, as in Fig. 6, can be led to the point where the two variometer coils are joined. Result-

Then again, the crystal wire can be left undisturbed and the wire from the fixed condenser and phones lifted instead. Another new circuit. Still again, this same wire can be replaced, so that the set looks like Fig. 6 again, but this time the wire

RCUITS" are to radio what there ever was a fundamental circuit, this pany. It gave absolutely no increase in from the ground is removed from the bottom end of the variometer and connected to the middle point instead. Here we have four circuits which can be made to look totally dissimilar on paper, yet which are all equally good. The slight changes in no way improve the operation over that of the original circuit, nevertheless they are changes. More than one tube circuit has been called "new" for less ex-

> The various sets just described are all of the "direct coupled" type. They are so termed because the aerial and ground circuit is metallically joined with the detector-condenser-phones circuit. Sets in which these two arms are not directly combined are said to be "loose coupled' ones. A typical set of this class is shown in Fig. 7.

#### Vario-coupler Set

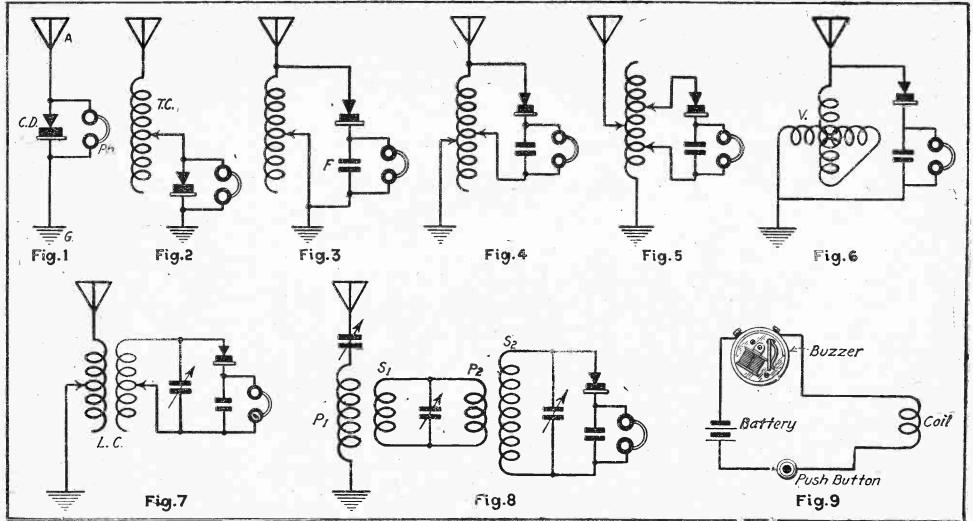
The new instrument here is "LC." This can be either an ordinary vario-coupler or a loose-coupler. The latter is an old-fashioned coupler in which the secondary slides in and out of the primary instead of turning in it. Its secondary is tapped.

The left hand coil is the primary. The arrow resting on it may represent either the primary slider of the loose-coupler or the switch of the vario-coupler. The right hand coil is the secondary. A variable condenser across it is of some help in tuning. The crystal detector, condenses and phones follow as usual.

There is little variation in loose-coupled crystal sets. The physical separation of the aerial and crystal circuits is their main feature. It enables the tuning to be sharpened somewhat, but not much. The looser the coupling between the primary and secondary the sharper the tuning, but also, in almost every case, the weaker the signals. A compromise must be struck some place for the sake of convenience.

Occasionally one sees a crystal set consisting of a vario-coupler, variable condenser and variometer, with the conden-

Continued on page four

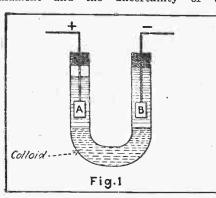


# Will Liquids Replace the Modern Three-Electrode Vacuum Tube?

Tests Prove Signals Can Be Received With Colloids When Properly Used

By WM. M. HENDERSON

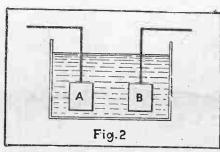
with the efficiency of the threeelectrode vacuum tube. It is also generally known that the disadvantages of the present-day tube are the frailty of the filament and the uncertainty of the



vacuum. These two disadvantages have caused many radio inventors to attempt the design of some form of rectifying and amplifying apparatus to take the place of the present tube.

The results obtained through tireless research and design have done much to further dependable radio transmission and reception. One of the most interesting of these developments is the use of colloidal liquids to replace the vacuum and filament

Though this form of rectifier and amplifier is not developed to an efficient stage,



and though it may never be, a simple description of how a colloid solution acts as a radio device will be given to the readers of this magazine to acquaint them with the new development and also to place before those who are experimentally inclined

sages are sent during the night if any

later information is obtained by the patrol

(d) Ice information is given at any

time to any ship with which the patrol

vessel can communicate on commercial

cencise English as practicable, and in the

following order states: (a) Position of

patrol vessel. (b) Location and descrip-

While on this duty the patrol vessel en-

deavors by means of daily radio messages

to keep ships at sea advised of the limits

The ice patrol vessel's radio call letters

are NIDK, and she uses a wave length

of 600 meters (spark) when communicat-

Daily Radio Broadcasts

the messages and broadcasts them from

Arlington at 10:30 a.m. and 9.55 p m.

on a wave length of 5,996 C. W. and

2,655 A. C. tube; from Annapolis at 5

p. m. on 17.150 C. W.: from Boston at

11 a. m. and 5 p. m. on 1,363 T. D. tube;

from New York at 10:30 a.m. and 5

p m. on 1,538 T. D. tube; from Norfolk at-

In addition the Hydrographic Office re-

ceives messages from masters of all ves-

sels, reporting ice, wrecks, derelicts, float-

ing obstructions and important changes

and aids to navigation, such as removal of

lights, change of timing of lights, or re-

moval of some tree or building through

which a range has been obtained.

10:45 a. m. and 4 p. m. on 1,363 spark.

The Hydrographic Office then picks up

traffic frequencies (wave length).

tion of ice. (c) Other data.

ing with passing vessels.

of the ice field

VERY radio fan is well acquainted | a working knowledge of a colloid "tube," | movement is given two explanations. One | using this type of "tube" as an oscillator so they may experiment with it if they

> The heart and substance of this "tube" is a colloid. Those who have studied chemistry know that a colloid is a compound which, when placed in a liquid, absorbs that liquid, similar to a sponge, and the particles of the colloid are held in suspension by the liquid. When the liquid is driven off from a colloid by evaporation one of two things will occur-either the colloid will become a hard, solid mass incapable of re-absorbing a liquid, or will become a solid again capable of reabsorbing a liquid.

#### Colloid Classification

Colloids of the former class are called rreversible, and when solidified after once absorbing a liquid are in a coagulated state. Colloids of the latter class are called reversible.

This suspension of colloid particles in a liquid is commonly called a colloidal liquid and sometimes a solution. Though neither of these is absoutely correct, they are now commonly used and will be in

Colloids generally form solutions called "sol"—that is, whatever liquid a colloid s placed in has "sol" placed after it to name the solution—as an example, alcohol plus a colloid equals alcosol. When a colloid is placed in a liquid the result is a perfect fluid, but not as a rule transpar-

Colloids are divided into two classes, emulsoids and suspensoids. The emulsoids when placed in water have the water penetrate their particles, while the suspensoids are those colloids which are not penetrated by the liquid—thus particles of suspended colloids will be in a state of suspension in the liquid. Emulsoids are mostly organic substances, while suspensoids are metals, sulphur, selenium, etc.

The latter are the ones used in radio work. If a colloid solution be examined under a powerful and sensitive microscope it will be noticed that there is a constant move-

charged at the same polarity. Consequently there is a constant repulsion between particles which would cause the movement noticed under the microscope. The second theory is that the liquid molecules are constantly striking the colloid particles. The impact between the molecules and particles gives the noticed parti-

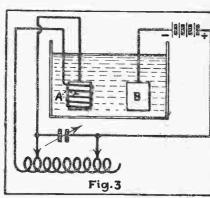
No matter which may be the real cause of this movement, and either may be wrong, still it is acceded that it is this particle movement which gives a colloid solution its rectifying and amplifying properties. A test of this can be made by using the apparatus shown in Fig. 1. A glass U tube, ε colloid, distilled water and two platinum or aluminum electrodes are necessary. These colloids may be procured in most drug supply houses.

With the apparatus mounted as shown in the diagram and a source of high potential current connected to the correct leads a concentration of particles around one electrode will be early discerned by the increased coloration around that elec-

When a colloid solution is to be employed as a rectifier of radio signals it is prepared as shown in Fig. 2. A glass jar. two electrodes and a colloid solution are necessary. Electrode B has four times the surface of A. This rectifier can be connected in a radio receiving set in place of a crystal detector. The signals from nearby stations will be received with greater volume than with an ordinary crystal. CW can also be received on this detector without the aid of an external heterodyne or a ticker. For best results the depth of A must be varied.

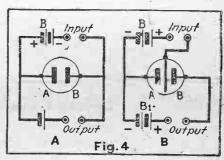
The action of this detector, however, apidly becomes weaker, and at the end of two or three hours becomes inoperative. Its activity may be renewed, however, if the connections are reversed. A constant reversing of connections will keep the detector in action for some time.

is that each particle of the colloid has a | in the circuit shown in Fig. 3. Here a charge of electricity and each particle is | control electrode, similar to the grid of a vacuum tube, is interposed between A and B. Reversal of polarity also materially increases the life of the oscillator.



Two circuits for using the tube as an amplifier are given in Fig. A. The first is for a simple two-electrode "tube." This operates in the following manner: An alternating current flowing through the input circuit causes a variation of resistance, which is, of course, proportional to the potential variations. Because of the negative characteristics of the "tube," a reinforcement of the alternating circuit is obtained in the output circuit.

For the amplifier circuit connecting a "tube" with a control electrode the action



is different. The variations in the applied alternating current force the control electrode to act electrostatically upon the flow of colloid particles between A and B, with a consequent slightly ampliment of the particles in the liquid. This | Slight success has been obtained by | fied current flowing in the output circuit.

### Radio Traces Course of Sea Derelicts

Continued from page on:

changed so that the publications of the 1 The Hydrographic Office was estabbureau contain reports from all the seven | lished originally in 1830 "as a depot for seas, and notes on conditions of the ports the purpose of taking charge of such on those same seven seas. The Great | nautical charts and instruments as had Lakes and other inland waters are not leen collected at the various navy yards, neglected, for they are taken care of in | and of assuming the care and issue of all Ice information is given in as plain,

charts and instruments furnished to

# **Radio Receiving Circuits**

Continued from page three

variometer between the crystal detector and the upper end of the coupler secondary, but a receiver like this is absolutely foolish. The bulky instruments absorb almost as much energy as they allow to pass, and there is precious little of it in a crystal set anyway. One variometer would do the work a great deal more efficiently.

#### Filter Circuit

The circuit of Fig. 8 is also a loosely coupled one, but the writer is willing to wager that it is a new one to a lot of broadcast listeners. It is a double-coupled affair, with two primaries, P1 and P2, and two secondaries, S1 and S2. S1 and P2 are arranged as rotor balls on one shaft, turning within P1 and S2, respectively. Three variable condensers are used: one tunes the aerial circuit, another the first | The test coil may have to be experimented cecondary and second primary at once and the third the second secondary. (Got it straight?) The crystal, etc., are across

The Hydrographic Office works hand in This unique layout was used in a now hand with navigation bureaus in all other obsolete ship receiving set before bulbs countries, and the data of each are interwere heard of commercially. Its one ad-

ser in series with the ground and the vantage was that of sharpness, a muchneeded one in crystal sets. However, it took a pretty strong signal to get through without being lost in the couplings. This circuit can be tried, as an experiment, with two vario-couplers. It will be found interesting, even if not startling. A dozen crazy departures from Fig. 8 can easily be evolved, but they will not be one mite

Fig. 9 does not look like a radio circuit, and is not one. It is a buzzer-test system for adjusting the detector. A hightone buzzer, a dry cel! a push button and two turns of No. 18 bell wire, five inches in diameter, are all connected in series. The coil is simply placed near the set, not on top of it, and while the buzzer is kept going the catwhisker is adjusted until the buzzing is heard loudest in the phones. The crystal is then all set for reception. with somewhat. If it is too close, the buzzing will be heard even with the catwhisker off the crystal; if it is too close, it

will not be heard at all. (The second article will take up some of the modern one-tube circuits, which are | berg has done so through crass stupidity very interesting to study. Watch for it.) or neglect of duty by her officers and crew.

#### Work of the Hydrographic Office

Since that time the Hydrographic Office has led the way in removing guesswork from navigation. With the aid of the Navy Department vessels it has charted the depths of all oceans, has disser all sorts of maritime information, maintains branch offices all over the world where shipmasters may receive the latest marine data and co-operates in every way with those seeking information. In fact, the Hydrographic Office goes so far as to issue printed question and answer pamphlets containing the information that many seek, and, until they try the bureau, seek

The Hydrographic Office was one of the first agencies to realize the value of wireless and early took the lead in pressing its advantages and the advisability of having every vessel equipped with aerials for the reception of ice warnings at least. It goes without saying, that had the Titanic the facilities that trans-Atlantic liners are furnished with to-day, in regard to ice reports at least, we would never have had the feeling of horror that passed over us when the wireless gave us the first inkling of the terrific loss of life in that

With the daily information of the track of the bergs as broadcast by the ice patrol and the endless research now going on to determine the speed and track of the Labrador current, we may rest assured that any ship which runs into a

United States vessels. It was also a part of the work of the office to ascertain the errors and rates of all chronometers sent to United States vessels on fitting out for

most startling of all marine disasters.

#### now look to America to help in developing radio broadcasting in their respective countries. This knowledge is based upon the events of the past years, which have conclusively proved to the world that America now leads in radio communication in all its

The adoption of an entirely new branches." and extensive program for the promotion of radio broadcasting in Latin America by American interests fol- Edward E. Pugh, president of the making a two-year trip to the South ment under which the American com-New York City, states that the mem-Waterways Commission, before leavpanies had jointly participated in bership drive carried out during the ing this city was presented with an South American radio business for last few weeks has met with success, official relay certificate by R. H. G. the past three years with interests as expressed in many letters received Mathews, central division manager of of England, France and Germany, is which indorse the club plan. announced by General J. G. Harbord, ceived has provided nearly sufficient R. L. relay operator and requires him president of the Radio Corporation funds to warrant the sponsors of the to forward all amateur radio mesof America. He says the new plans club in selecting a club home. A sages that he receives during the give the United States its first unre- suitable location on Eighty-sixth long voyage. stricted opportunity to utilize fully sterdam avenues, is under consideraits resources in developing radio in tion. South America. Five of the principal countries of the continent—Arinnual dues of the club were origithe Big Bill will eventually travel gentina, Uruguay, Chile, Venezuela nally placed at \$5, early in August around the world, he will have the

General Harbord

Announces New

Radio Plans

American company to direct its radio activities with far greater efficiency the activities of the club enlarge and funds are required for extension. Mr. point of three important angles, that than the previously existing arrangein addition the introduction of a practical method for the support of broadcasting which will be first applied as a trial to the powerful broadcast station at Buenos Ayres.

stock promotion.

per cent.

Opens New Radio Store

Band Broadcast Is Difficult

Invalid Appreciates Radio

To secure faithful reproduction of

General Harbord explained that negotiations with other radio companies in South America had been in Company, on July 21, was the host at progress for several months, the out- an informal dinner to a number of come of which was the dissolution of radio editors. the original local organization known Mr. Furness made a very interestout that one radio company in Eng- economic phases of the radio battery land, France and Germany, together question. He also announced that a with the Radio Corporation of Amer- new and revised price list of Eveica, had originally formed this organ- ready "B" and "C" batteries would ization as the sole distributing become effective August 1. agency for the sale of radio apparatus of English French, German has produced a new heav: duty 45and American manufacture, but this volt "B" battery, having about two business on a basis best suited to the at which it will be sold, users of the

"The cancellation of this former Mr. Furness remarked that the polnew era in our South American radio was constantly to reduce battery stations. activities," General Harbord said. costs and that further reductions the banner of the United States' engineering and designing forces attor. We have been somewhat re- aiming. tarded in the South American field, due to the restrictions imposed by the four-sided compromise which has been in force since the end of the

"One of the outstanding advantages of the plan which was made effective following our release from fective following our release from Northern Radio Company has been ing direct contact with the South pre-eminently successful in the oper-America radio market from New Vesey Street and 127 West Thirty-York, thus eliminating the expense third Street. They specialize and are incidental to carrying on operations authorized dealers in De Forest sets three "B" batteries and a "C" batteries through intermediate distributing and tubes, and are counted among the and tubes, and are counted among the tery, a number of sets of batteries centers. With newly organized outbiggest retailers of this well known have been sealed in evacuated airlets forming a part of the distribu-line. One of their main lines is an tight metal containers that have been tion circuits, terminating at Buenos
Ayres, Montevideo, Sao Paula, Rio de
of the well known manufacturers
low the water line of the ship. The Ayres, Montevideo, Sao Fauia, Rio de Janeiro, Valparaiso and other leading cities, every new development in broadcasting apparatus will be made Radio Company.

On the well known manufacturers being represented. Philip Feldman is president of the Great Northern Strip around the hull. tically simultaneously with their introduction in the United States.

"There is every reason to believe large bands has always been a diffithat Latin America will continue to cult problem for broadcasting exshow an increasing interest in radio perts. The volume produced by indibreadcasting. Particularly is this vidual wind instruments varies greattrue now that a way has been devised ly. The work-of each is important, to give her the advantages of appa- to a harmonious whole; consequently, ratus embodying all the latest im- if the microphone is not well placed, in this body is restricted to amateurs provements contributed by engineers a very unfaithful reproduction is and scientists in the United States. secured. Such cities as Rio de Janeiro, Buenos Ayres, Montevideo, Sao Paulo and Tom Masson To Be at WJZ nominated by members and voted Valparaiso, and other centers of art | Tom Masson, for twenty-five years and education scattered throughout the managing editor of "Life" and field, High River, president; A. H. the republics of Latin America are recognized as one of the greatest au- Asmussen, Calgary, secretary; A. V. some of the great reservoirs which thorities on humor in the world to- Evans, Calgary, secretary, and W. broadcasters may tap for a variety day, will speak from station WJZ on Schopp, treasurer. Members of variof program matter to be broadcast to Friday, on the subject of "Humor," ous committees have been appointed. millions of homes where the light of Just what angles of that comprehen-

sive subject he will treat is a secret "Unlike North America, distances which he wishes to keep until the between cities are greater and a large time of his address. percentage of the population resides in the vast farming regions. Radio broadcasting must break down these barriers of space which isolate town R. Helms, of Monroe, N. C., back on casting daily, except Sunday, a special and village from the cities. Wire his feet after an invalidism of over report on the farm movement of let facilities, too, are not within as easy fourteen months. Writing to WGY tuce. This report will be prepared reach of the people of South America recently, he said: "I am one patient by the New York State Department of as they are in this country. Radio that an M. D. prescribed a radio out. Farms and Markets and will inform broadcasting will do much to supple- fit for and it was the greatest pre- the farmer daily where the bulk of ment existing means of communica- scription he ever made, as it has done lettuce shipments is being made. tion such as the telephone and the telegraph.

me more good than specialists and type; loud speaker and batteries in cabinet 18x12x7; weight 24 pounds

**World Radio History** 

#### **Amateur Receives** Special A. R. R. L. Certificate

CHICAGO .- E C. Page, of Evanston, Ill., radio operator for the Commonwealth Radio Club auxiliary ketch Big Bill, which is Commonwealth Radio Club of Amer-Seas in the interest of the Deep ica, 104 West Eighty-fourth Street. the American Radio Relay League. The number of enrollments re- This act makes him an official A. R.

Street, between Columbus and Am- Being himself an amateur of connounced his intention of communi-Mr. Pugh also states that while the cating on short wave lengths. As and Brazil—will benefit by the new these will be increased to \$10 per unusual opportunity of being able to The program not only includes a until after the opening of the clubmany foreign countries. His transyear, and will remain at this figure converse in code with amateurs in change in the system of distributing house some time during August. Subsequently the dues will be raised as from 80 to 700 meters.

the activities of the club enlarge and This set was built from the stand-Pugh states that the C. R. C. A. is a of amateur low loss practice, comments had permitted, but it involves membership organization to benefit mercial efficiency and practicability, radio fans and is not in any sense a and, finally, its adaptability for hard usage on board a ship at sea. The Hartley circuit is used, employing two fifty-watt tubes connected in Reducing "B" Battery Costs parallel. The entire equipment was G. E. Furness, manager of the raplanned and assembled by Frederick dio division of the National Carbon Marco, R. H. G. Mathews and William Schweitzer, of this city.

The power supply is obtained from a 1,500-volt dynamotor. The ship is as Radio Sud America. He pointed ing talk on certain engineering and equipped with a thirty-two-volt light system and this operates the radio through a series resistance. Copper bus bar wiring is used throughout and special attention has been given

He also stated that his company Porcelain supports are used wherever possible, and in such places as and American manufacture, but this and one-half times the capacity of has been substituted. No molded ly flexible to enable the participating the older type of cell. Considering material of any kind is found in the members to conduct their individual this factor and the new lower price equipment. The dielectric losses have technical and commercial develop- heavy duty battery will achieve a resign and construction. Loading inbeen minimized through careful dement of the art and industry in South duction in battery costs of about 65 sign and construction. Loading inductances have been provided to bring the wave length up to 700 agreement marks the beginning of a icy of the National Carbon Company with commercial ship and land meters to allow for communication

The tuner, which is of the low loss "We are now in a position to carry might be expected as the company's type and embodies all of the special advantages of that form of construc leadership in radio below the equareceiver has a wave length of from 50 to 200 meters and will be used exclusively for picking up short wave The Great Northern Radio Comamateur sending stations. pany has opened a third store at 4

A second tuner with a wave length West Forty-third Street, near Fifth range of 200 to 600 meters has been Avenue, which will make a specialty installed. This is fortunately prosignals on wave lengths of 2,000 meters and up. A complete set cf ation of its other two stores at 60 "spares," including rheostats, tubes, condensers and key, is carried.

#### Alberta, Canada, Forms **Amateur Association**

CALGARY, Alberta, Canada,—Radio amateurs from all sections of Alberta berta Radio Experimenters' Association with the object of consolidating licenses and serious experimenters upon. The officers are Dr. Bedding-

For Lettuce Farmers As a special service to New York State farmers marketing lettuce, one of their most perishable crops, station A radio prescription is putting S. WGY, Schenectady, N. Y., is broad-

"It is a well known fact that Latins every shut-in could have a radio set." | guaranteed one year complete, \$45. Wat-kins 1701-J.

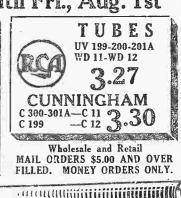


Remember—WALTHAL'S INSURANCE POLICY PROTECTS YOU ALWAYS! Prices Good Until Fri., Aug. 1st

PROPHECY We predict that within a very short time every radio concern will follow WALTHAL'S lead or be compelled to render this invaluable

Eveready Battery Co. reduces prices. WALTHAL falls in line. 214 V . modium , 21 49 Eveready 22½ V., large . . . 1.49 Eveready 45 V., large.... 2.63 221/2 V., large .. 45 V., medium...... 1.95 45 V., large.. Eveready 41/2 "C"..

X-Ray is to the medical profession.





\$14.95 **TRANSFORMERS** 

WESTERN ELEC. 10D, \$34.95 MUSIC MASTER Lowest Price

108 Volts-\$5.90 leavy Duty, Long Life, Noiseless, STANDARD SETS EASY TO BUY - EASY TO PAY Use This Coupon Please send your representative to give me

### MID SUMMER SALE

Big Reduction on all Standard Sets and Parts Paragon, De Forest, Crosley, Etc.

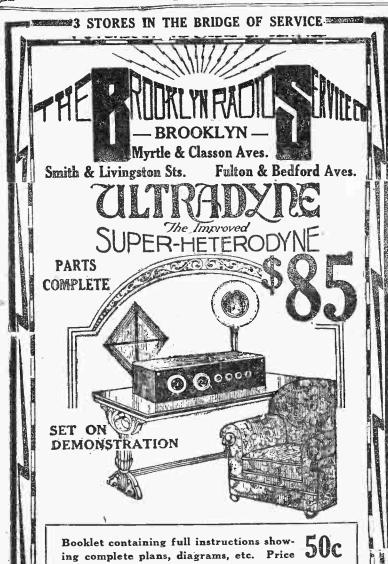
Full stock of loud speakers and large assortment of high grade parts for those who build their own.

During July and August we close at 7 P. M. Tuesdays and open Wednesdays at 5 P. M. MAIL ORDERS GIVEN SPECIAL ATTENTION

TREMONT RADIOPHONE CO.

541.EAST TREMONT AVE. EMERICH A. SPITZER, Prop.

THE HERALD TRIBUNE is broadcasting every Sunday in the RADIO EXCHANGE exceptional buys in Radio parts and equipment. Tune in every Sunday and receive service, sound advertising and low prices.

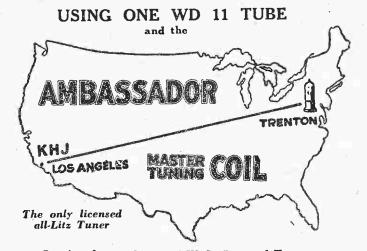


#### JUST A FEW OF THE FEATURES . Combines distance, selectivity and volume.

- 2. Completely cuts out all local stations by one degree variation of the dial and brings in distant stations other sets fail to get.
- Uniform and maximum radio frequency amplification can be obtained over the entire wave length range.
- The Ultraformers are designed to amplify at one frequency only, and only the desired signals can pass through them.
- 5. Only two dials for all wave lengths.
- 6. Incorporates every good feature of the famous Super-Heterodyne.
- . Employs new modulation system, which makes it the most sensitive receiver known.
- 8. Aerial or Loop.

#### SPECIALS LOUD German Telefunken \$1.00 SPEAKERS Weston 59c CONDENSER HEAD SETS Firth \$4.98 ACME 10-LOS \$3.95 \$30.00 Music TRANSFORMERS

# Trenton—Los Angeles



Quoting from a letter of W. L. Burt, of Trenton, N. J., to Broadcasting Station KHJ, Los Angeles.



"I tuned in your station — with a hook-up consisting of an Ambassador Coil, .0005 variable condenser with verfier and a WD II tube without any amplification — I distinctly heard your announcer mention the following subject — "IS Bobbed Hair a Short Cut to Common Sense and the subject is subject."

Try an AMBASSADOR COIL in place of your variometer or variocoupler. If it does not improve your set one hundred per cent. bring it back within five days and your money will be refunded.

BEWARE OF IMITATIONS—ONLY THE GENUINE IS GUARANTEED

AMBASSADOR SALES CO., Inc. 108 Greenwich St. Phone 6487 Bowling Green New York

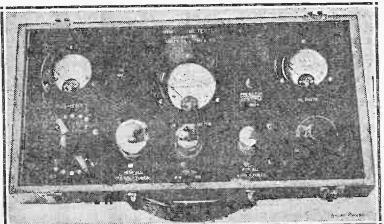
### A Timely Hint About Tubes

New Device Determines Instantly the Worth of Spurious Tubes

By S. J. SLATER

ITH the expiration of tube giving an instant reading in figures patents and the advent of of oscillation or sensitiveness of the new bulls on the market, tube by a special Thermocoupled galmyriads of radio tubes, each with in- \anometer besides giving all the dividual characteristics, are sold over other characteristics of the tube, the counter to-day to people who ac- such as filament voltage and ampercept them more or less passively and age drain at one reading. then hope that they are good ones. This new tube tester has lately It is but too true that at least 95 appeared in one of New York's largper cent of these radio tubes receive est radio concerns, namely, the Libmore test before the customer erty Radio Store. The exactness of nan merely lighting of the filament the tests is so fine that a good tube some of the larger and better is instantly told from a less sensitores go so far as to test for plate tive one. Some tubes show normal current, or the flow of "B" battery voltage and amperage readings, but current through the tube, but neither are low in oscillation. These are imf these methods proves the merchan- mediately sent back to the factory

and the customer gets a perfect tube lise to be good or operative. It is a fundamental fact in radio instead. The outfit is rather an inthat the tube is the heart and soul genious one. It is small and probably of the set, as well as the most ex- weighs only ten pounds. There is a consive item. Hany people complain single three-way switch for 2, 4 about the performance of their sets, and 6 volt supply from the usual hough never considering the tubes- storage "A" battery, a switch for saying they can't get any distance at 22½ or 67½ volts on the plate of the all while their neighbors with less tube for detector and amplifier rexpensive sets get everything. But spectively and sockets for any make



increase in volume is noticed, mostly photo. a better quality of reproduction and decided increase in sensitiveness Unsuccessiul results with the better tube. Such cases are very frequent and are especially probable now when the narket is flooded with all sorts of ubes, most of them beautiful imitations of the good kind. Since I am

timely hint to prospective purchasers. It is evident that the only authentic several days in a tested set and notand I have had tubes which were not so good—also some which I have been which I have been which was heard now and again. 'stung" on-but no longer can the The afternoon transn

latter type be sold to me! hundreds of tubes per week, giving the heart of London equipped with each tube the elementary test for amperage, voltage and milliamperage -such a test has been inst lled in the evening experiments. The new some of the larger stores. Ridicu- station was best heard in the mornlous! Those hundreds of tubes have ing hours. In fact, it was heard too still to be tested and the purchasers easily. With headphones the signals will do it, but, because of the lack were so strong that one had to "tune of a standard of comparison, they out" so as not to be overwhelmed will not know how good the tube is with the volume of sound. and will continually be left in the The Chelmsford station, which i dark about its quality. Lucky he is known as 5XX, has been loaned to if he gets DX, clarity and volume the British Broadcasting Company with no distortion but if he doesn't, by the Marconi people for experican he have a con back? He gets mental purposes only. It is sixteen local stations—but is it therefore all times as powerful as 2LO, the London well and good? Locals come through station of the B. B. C. Its twin under the worst conditions and are, aerial masts, 450 feet high and 800 therefore, not good indicators of tube feet apart, completely dwarf the little efficiency, which we desire.

Up to the present, there were no shortly. stores testing tubes for oscillation in The first experiments from the new actual comparative figures. Just try- station were devised primarily to deing the tube in a set is a fairly good termine the extent to which the eftest, but not at all accurate, and then | fective receptive range of the crystal how many stores test tubes that way set can be increased.

One solution lies in the new Trin- mately twenty-five miles. My beity Tube Tester, manufactured by the lief is that by transmitting from a Trinity Manufacturing Company of sufficiently powerful station this sets or parts the Radio New York and developed by their re- range can be increased to 100 miles search engineers to the degree of its at least."

then when one day a lamp burns out of tube. The meters are of high qualand a replacement is made, you may ity and give accurate readings. The hear them—quite commonly—raving galvanometer is of the thermocoupled about the DX they are suddenly able type and reads to units. A satisfacto pull in. In such cases usually no tory idea can be had from the above

# Try-Out of 5XX

the world's biggest broadcasting stacertain that good results in a radio tion was opened at Chelmsford in Esset cannot be obtained if the tubes sex recently, and its debut was anyused are not good oscillators and are thing but a success. Listeners-in in not sensitive, this is offered as a London who were all keyed up for the occasion were very much disapproof of the quality of a radio tube pointed to hear practically nothing. the heart of the set-lies in the After a time they did manage to slow method up to and at present make out a faint mumbling and some mployed: that of using the tube for time later an occasional word could several days in a tested set and noting the quality of amplification and be understood but there was a pergeneral sensitiveness. I have had sistent interruption from high-pitched tubes which I've prized highly for whistling Morse signals. Another their excellent quality and clarity in peculiar feature was a curious sound reproduction of the vocal frequencies like that of a watch being wound up,

Imagine a large radio store selling could not be heard at all. People in crystal sets failed likewise to hear

town of Chelmsford. The wave Then how can we know, when we length is 1,600 meters. The actual buy a tube, whether we are getting power used at first was 15 kilowatts, but it is intended to increase this

for customers-and is there broad- As Captain Eckersley, of the B. casting going on every minute of the B. C., puts it: "The present receptive range of the crystal set is approxi-



BRITTANIA SILVER CASTING CO.



U. S. Tool Company, Inc. Announces the Following as Sole Distributors in New York Territory for the Coming Year:
Continental Radio

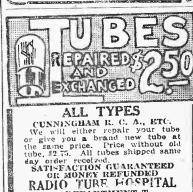
& Elec. Corp. R. H. McMann, Inc. Chambers St. New York City McPhilben Elec. Radio Corp.

Jamaica, L. I., N. Y.

Wireless Klein Co. On Sale By All Good Dealers U. S. TOOL CO., INC.

117-119 Mechanic St., Newark, N. J.

UNITED SCIEN LAB SCIENTIFIC Made of Superior Materials by Master Builders





DEPARTMENT T

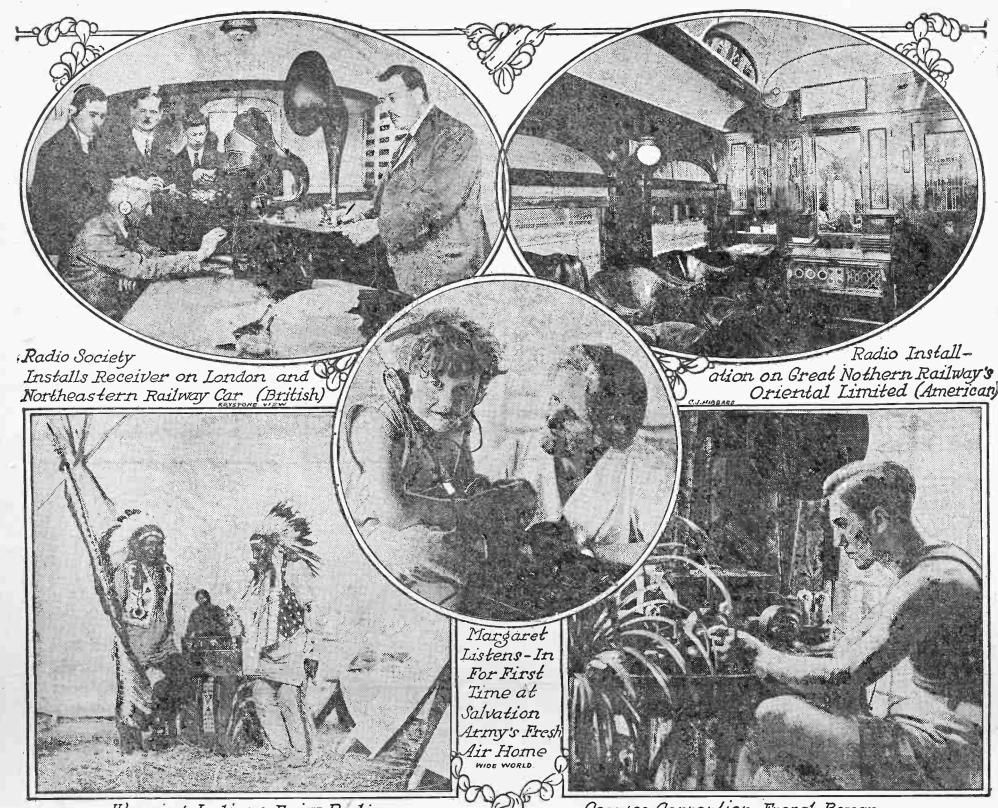
206 BROADWAY NEW YORK

Cor. Fulton St., Room 18

THE **RADIO EXCHANGE** 

If you want to buy, sell or exchange your radio Exchange will help you.



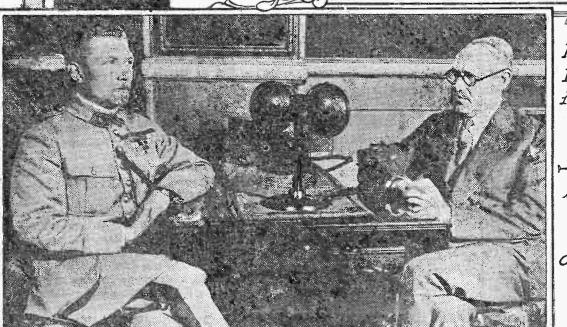


Wyoming Indians Enjoy Radio

Enterprising New York Bootblack Stimulates Trade By Radio KADEL & HERBERI

New Jersey Eagle Scouts Eat to Radio Music





Capt. Nungesser French Aviat ion Ace,Talk "Mike" KADEL & HERBERT **-500}=** 

German Fans try Out Umbrella Antennae in Munich



A DEPARTMENT OF - COPYRIGHT BY -POPULAR DISCUSSION R.P. CLARKSON OF TECHNICAL POINTS USUALLY CONSIDERED TOO INTRICATE FOR GENERAL EXPLANATION

HINGS never are quite so bad when | wind blows strongly the branches sweep | cumulating all over the set. The ground they happen as you may have been giories of our imagination. If we get an inkling that the future will be unpleasant. and the future is far enough off, before it gets here the imagination has created in us an enlarged idea of just how bad it was supposed to be. The effect is a good deal as if you hold a coin out at arm's length and then bring it up near to the eye. When it is close it blots out everything else. Perhaps some such reflection was responsible for the oldtime slogan "They all look good when they're far away." Anyhow, here we are in midsummer, and radio reception is still pretty good. DX comes in with real volume, but somewhat noisy. Rarely does our old

against that end or against the insulator out there and you have a fading effect which you lay to unknown causes. Perhaps that insulator got wet some time and covered with dust. Perhaps it is unglazed porcelain and takes up moisture in this kind of weather. Perhaps you bought some "Jersey mud" insulators and they worked O K up to recently, but now the heat of the sun has got after them and they have broken down or warped into such shape as to form pockets for the moisture and dirt to accumulate. All these things will help to give you consistent weak reception and you blame it on the

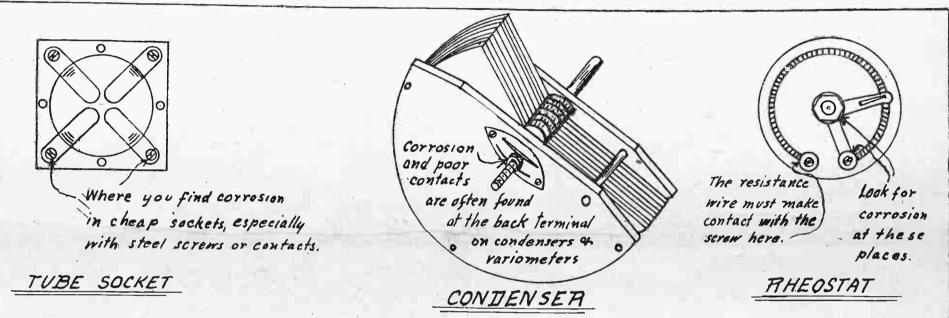
Then on the other end of your aerial, how about it? All the foregoing remarks

connection may be corroded. With the changes in temperature some of your binding post connections or any of the connections depending on nuts may have loosened up. You must go over the whole thing carefully every little while.

Another point of importance, especially in home built sets, is the question of insulation of the coils. Have the forms you wound them on taken up moisture? Are the windings themselves perfectly dry? With the exception of annunciator wire, almost all wire insulation is splendidly absorbing. It will soak up moisture like a sponge, cause leakage between adjacent layers and change the action of the set so that you wouldn't know it. The remedy,

the negative terminals. If we have several of them wedged tightly together, they may be connected and cause leakage of their current and a consequent loss to the set. In the hot sun, B batteries are not improved any, especially if the sun shines through glass. One of the panel manufacturers tells me that, after a complaint from one of the dealers who mounted heavy parts on a light panel and put it in his show window, he made a little investigation and found that the temperature inside that window, by reason of the action of the plate glass, was unbelievably higher than he had ever believed would be found in practice anywhere except under artificial heating. No wonder the panel

It might not be amiss to say here that



Triend "static" create enough disturbance to spoil the program. Those of you who put away your sets in moth balls for fear of poor reception this summer haul them out again, because there is nothing in it. Summer radio is here to stay, and the sooner the dealers persuade themselves of that fact the sooner their business will pick up. I suggest that some of these bob-tailed radio dealers' associations get up a slogan of all the year round for radio and proceed to put some punch in the slogan by helping the stations raise the standard of appeal of their summer

There are some extra precautions that have to be taken in the summertime use of the radio set, and lack of this care causes some loss in volume and some of the noises we attribute to static. The three outstanding things to notice are the sun's heat, moisture in the air, which easily condenses on anything metallic and even moderately cool, and the condensed moisture which we call rain; also the fact that trees and plants are alive again with leaves out, branches and twigs growing and sap in them. These little changes in nature affect radio reception. They may affect the operation of your set, so that it may have fallen from its position as the pride of its owner to the more humble place of the curse of the family, but the fault is yours. It isn't the season; it's your failure to notice the fact that the season has changed.

Take, for example, the aerial. You put it up last fall, perhaps, and it worked well. Even now, as you look up at it, it seems to be just the same, but have you noticed that the tree you fastened it to has grown out and now surrounds the far end of the aerial, where especial care in insulation is necessary because that is the high voltage end? Sometimes when the

sibly the aerial is held up by ropes in place of wires and, as dry rope is a fair insulator, it was perfectly good until the rainy season came along and the rope soaked up moisture. Possibly the wetting and drying out of the rope permit the aerial to sag at times. Look also to the guy ropes and cables. Are they fixed so sagging or blowing will cause temporary contacts? Another possibility is that where you soldered the lead-in to the aerial the swaying and sagging have broken the soldered connection and now that is corroded just as badly as though it never had been soldered. This is the kind of weather that will cause almost any foint to corrode so badly that it has almost no power of conduction.

Look well to the arrangement you are using to prevent the lead-in touching the roof or any part of the house. Did you tie it out with a cord which gets damp at night and offers a good leakage path? Did you push it away with a piece of lath which does the same thing? Did you use an insulator so arranged that it can fill up with water or get all covered with dirt. and make a perfect connection to ground?

How about the place where you bring the lead-in through the side of the house? Can moisture get to it there and ground it to the house? Normally the rubbing against wooden frames does not have an appreciable effect, but in these damp days and those to come every precaution against leakage must be taken. Perhaps you are using one of those flat strips that vou can shut the window down on. How about it? Is it soaked up with moisture when you get up in the morning? If so, it probably is when you are listening in.

Then inside the house there is likely to be moisture, and with the windows open there will be dust and dirt ac-

will apply and perhaps a few more. Pos- | of course, is to dry them out in the oven or even in the hot sun, and then waterproof them with collodion, thin shellac or something similar, and you may have to do this several times. Even the best of the honeycomb coils are apt to soak up water so badly you can squeeze it out in drops by pressing your fingers on that fiber strip around them. If you are using honeycomb coils and they have fiber strips and your reception is poor, dry out the coils in the oven and dip them in collodion or thin shellac You will find an uncanny increase in signal strength. One of the secrets of good

ception is unusual care taken in insulation and in good joints. Even the air is more conducting then usual. The base board of your set may be causing losses that would never be present in winter. It should be dried out thoroughly and soaked paraffin. if the instruments are nounted on it. If your lead-in wire or your ground wire is not rubber covered or paraffin soaked it will pay to take that down, coil it up and soak it in paraffin or buy the proper amount of wire to replace it, being sure to get wire with moisture-

Of course, surrounding foliage may hurt reception considerably. To large extent, however, we hurt reception ourselves by being just a little more careless in the summer than we need to be. We can get away with almost anything in the dry season, especially when the furnace is going and everything inside is snug and clean. In the summer, though, it is another story. We must then use conscious effort and continual watchfulness to anywhere near approach laboratory conditions.

Even our apparatus which we buy needs to be attended to. Dry battery covers get damp-those cardboard cartons that are such a nuisance in connecting wires to panel mounting of instruments is the only all-season method of mounting that can be depended upon to give good insulation. unless all wires are spaghetti covered, is insulation in all seasons. On the other hand, stiff wiring flat against a bottom board is bad. If it is to be against the sub-panel, the sub-panel must be of good panel material.

Look also to your condensers. Clean them out between the plates, using pipe cleaners bent around into a loop. You can get two packages of cleaners for 5 cents in any cigar store and there are twelve cleaners in a package.

ers. What a time one make of variometer gave us last summer with corrosion of the spring contacts! Everywhere in any moving part in your set where there is sliding or frictional contact, look it over and keep it clean. You must realize that in radio not only is cleanliness next to godliness, but also that too much cleanliness and care is next to impossible. Your signal will repay you for every joint you

Finally, look over your rheostat carefully. Is there any green on it or on the potentiometer? How about the spring contact arms on your tube sockets where the binding post screws go through? That is an occasional source of trouble. Then down at the storage battery. Keep the top dry. Keep water up over the plates. Keep the terminals bright and clean. Disconnect the clips and scrap off all the corrosion. If any binding posts go through wood, see that they are insulated. If the battery leads go through wood, unless the leads are rubber covered, put in insulating hushings.

In short, the idea now is to keep corro-

Also, stiff wiring, such as bus bar wiring, the only method of getting 100 per cent

Look to the contacts on your variome-

sion, dampness and dirt away from the set; to keep all joints soldered well, to keep all friction contacts bright and in every way for this next month or six weeks, conserve our signal strength. Then we will know that summer radio is just as pleasurable and important as winter radio ever was or ever will be.

very blunt opinions about that con- tion of broadcasting while it does troversial subject, radio advertising. last, we believe that it is futile as Although his conclusions are not es- well as unfair to compare adverpecially analytical, they stimulate tising in magazines with advertising thought and we are moved to add on the air. The Senator claims that a few lame remarks of our own the public is deceived inasmuch as

Last Week on the Radio

By Pioneer

Senator Arthur Capper was recent-

ing the salient phases of the subject, and was emphatic in expressing the paragraphs of subtle publicity that conviction that any attempt to take is published in some of the best undue advantage of the public good- magazines every year? We could will toward radio, or to mislead or name a dozen and one publications will toward radio, or to mislead or deceive the public to any extent would call for prompt and drastic man interest." The innocent reader

liberal and open policy. Attempts to little word "Advertisement" at the commercialize broadcasting, or make top or bottom of a page does not alit directly profitable, have been based ways grace the sheet carrying a pure the control of the broadcasters piece of publicity. hat on \_\_\_\_\_ tving something for nothing, a wrong principle of business. But I have never talked with facts, it is a bit unfair to call every the purchaser of a receiving outfit advertising broadcast on the radio, who did not honestly believe that he propaganda or publicity, in the more had paid the price of admission to subtle meaning of the word. We have 'listen in' when he paid for his equip- always been inclined to compare it

"It is common knowledge that the stations because of the great stimulation to the industry offered by highruing from the mere announcement hat the numbers are being furnished

"The magnificent volume of the moralize the entire business.

"Broadcasting stations, in developthe bought-and-paid-for service.

comment on the obviously demoral-scheme. zing and deceptive practice broadcasting disguised indirect advertising for which the station has received a fee. For some years now it has been illegal for a newspaper or magazine to publish anything in naid-for space without indicating unmistakably that the matter is paid advertising. The laws were passed because the practice of disquising advertising as 'reading notices' or news matter was considered an imposition on the public and a deception. And the broadcasting of paidfor indirect advertising, without a clear statement of the fact at the beginning of every message, that the speaker has paid for the privilege of broadcasting, is no less a deception and an imposition so far as the pub-

"The radio industry has been built up on the principle of giving the people what they want. Millions have of receiving and transmitting mesbought receiving sets because they sages on a wave length of 185 meters felt assured of the privilege of listening to broadcast information and 7:30 express from King's Cross to entertainments designed entirely in their interests. Therefore, it is now miles an hour. As it sped along mesridiculous to suppose that the industry can be successfully developed further by a reversal of the policy. menters according to instructions from The broadcasters cannot hold or in- broadcast stations were picked up. crease the interest of the public by using the entertainment feature as ment was to note the effect that a lure to put over an increasing volume of paid-for, propaganda and in-

TE HAVE before us a recent thing but a passing phase of radio statement of Senator Arthur development and that it can do noth-Capper in which he expresses ing but menace the artistic evoluwhich may or may not add more un the radio broadcaster of advertising derstanding as to the possible out- do not label their output as such. We come of the present aims of broad wonder if the good Senator has casters. First, let us present the stopped to think about the thousands words of the Senator, quoted from of tons of paper that is used every vear in the production of magazines that do little but publish "reading ly asked to state his opinions regard- notices?" We wonder if he takes into consideration the millions of "The radio industry," he continued, completely are some of the less sub-"has been marvelously built up on a stantial publications subsidized. That

with what is known in advertising circles as "reader copy." This is copy manufacturers of equipment have largely supported the broadcasting stations because of the great stimuthis when the broadcasting has been class entertainment and other fea- placed in the hands of the better tures. It is also generally known broadcasters like WEAF. Here a very at large stores, hotels and other respectable censorship is maintained and on but few occasions have we present and on to doubt the judgment of broadcast high class and interesting these responsible. We often rant westrams because of the goodwill as sting of the salad dressing makers, but we confess that there is no great reason to feel insulted or incensed.

Our objection to advertising on the radio industry has been built up by air is based on the fact that it may healthy and honest competition in the become general and thereby dangerbroadcasting of quality programs. ous. It will also tend to rob broad-The manufacturers of equipment are casting of prestige and interfere evidently more than willing to spend with its more artistic development. large sums of money in order to Such outspoken commercialism as furnish the only attraction that en- advertising is a poor foster mother

courages the wide purchase and use to so tremendously an important of their receiving equipment. And it thing as radio. Associating adveris perfectly logical to suppose that a tising with it cheapens it and invites reversal of their competitive policy disaster. It is also a thing that can would have a strong tendency to de- be very easily overdone. Already some of the smaller and less important studios are looking toward ading the paid-for propaganda and advertising, will create competition enue. One New York station has exwhich will lead inevitably to a let- ploited its broadcasting facilities in ting down of the censorship bars. such a flagrant manner that one can-The necessity of getting the business, not help but wonder where this unof selling the service, will encourage wanted offspring of radio will end. leniency of supervision, and that They have advertised for chorus girls station will get the most business and for dinners at Broadway hotels. which offers the greatest liberality openly mentioning the "best meal on in passing on broadcast messages of Broadway for \$1.50." This is an extreme case, but it serves to show that broadcasting can very easily degen-"It seems almost superfluous to erate into one gigantic advertising

Advertising and radio are warm friends even in the smaller towns where the clothing stores, the ice cream manufacturers and dry goods shops hire talent at \$5 or \$10 a night for the privilege of having the muchsought-for courtesy line attached to the announcement. It would seem that radio is gradually falling back into the arms of a crafty exploiter, advertising by broadcasting as a real artistic expansion unshackled by the sign painters and ferved copy writ-

Radio Experiment on

Railway Tried in England A successful radio experiment was recently conducted in England by the Radio Society and the L. & N. E. Railway. A wireless station capable was installed in a rear coach of the Newcastle going at the rate of sixty sages sent by various amateur experimenters according to instructions

The primary object of this experitunnels, cuts, bridges, ore-bearing localities, etc., have upon wireless signals. Signals were entirely lost help you. Although we have never been con- going through tunnels and passing vinced that radio advertising is any- over limestone rock.





60 VESEY STREET Bet. Church Street and West B'way

**8** 5 8

PATRICULAR WATER

ceptrada always on demonstration.

**NEW STORE** 

4 W. 43d St. Just West of 5th Ave., Penn. 7865

127 W. 33RD STREET Bet. 6th & 7th Aves CORTLANDT 4263 When Great Northern opens a new store it is truly a time for real Radio rejoicing. 4 West 43d, OUR THIRD STORE, will bring to its doors Radio enthusiasts who can afford to buy the Best. 5th Ave. needs Great Northern. We will cater to 5th Ave. as only Great Northern can do.

Under Your Set And you can Rotate it with One Finger SOLID AND SUBSTANTIAL ATTACHES PERMANENTLY IN 3 MINUTES AND RAISES SET BUT 14 in. FROM TABLE.

\$5.00 post paid ANYWHERE IN U. S. A.

HENDERSON and LATHROP, Inc

HEAR IT—ON DEMONSTRA-TION AT GREAT NORTHERN **BLOWOUT PREVENTOR** THE FAMOUS D-10

COMPLETE NOTHING ELSE TO BUY

Reflex

A Four Tube Long Distance In-

door Loop Receiver, with Self-Contained Batteries and Loud

These sets are slightly shopworn, but so slightly that any defects hardly noticeable. Absolutely guaranteed by us. Internally just like Purchase these sets on our say so. They are a truly remarkable buy.

-SUPER-HETERODYNE-Will be the biggest sellers in the fall. If you want to hear the best in

WHOLESALE AND RETAIL

Super-Heterodyne listen to the COMO or ACRACY at any of our stores. Re

If you want to buy, sell or exchange your radio sets or parts the Radio Exchange will



Your Radiola Super-

Heterodyne

IS DIRECTIONAL IN THE LENGTH OF THE BOX.

Turning the set toward the desired station eliminates in-

distance. Get the benefit of this wonderful feature.

Put One of Our Special

"SUPER-HET"

Ball Bearing Mountings

At Last! Economical Tube

Insurance 50 CENTS INSURES YOUR TUBE AND SETS. AND SETS.
PREVENTS BLOW OUT OF TUBES.
PREVENTS DAMAGE TO WIRES.
PREVENTS EXCESSIVE VOLTAGE.
OR SHORT CIRCUIT RISKS. Order from your dealer or from Rusonite Products Corporation,

60 WHERE THE CROWD GOES! COLUMBISHO 874 Columbus Av., (102d-103d) 22 E. 125th St., nr. Madison Standard Merchandise Sale Now Going On

We have a following! BECAUSE—we have never been out of stock on advertised merchandlise, never refused to refund money, nor have we ever made a promise that wasn't kept.

OUR \$100 SPECIAL 5 TUBE SET 10 DAY FREE TRIAL

distance, Clarity, Volume Guar-nteed—You Are To Be the Judge. 

DEAL WITH THE MANUFACTURER DIRECT AND SAVE MONEY
Insure yourself for BETTER SERVICE and GREATER
SATISFACTION, HIGH QUALITY and LOW PRICE.

& P NEUTRODYNE THE STANDARD 5-TUBE SET

A & P NEUTRODYNE

Listened to Los Angeles for one-half hour on the Loud Speaker. The location is very poor-right in the heart of N. Y. C., facing an elevated train line.

Mr. Comasey gave a party that evening. Some of those present who listened in are: Miss Helen D. Reilly. Mrs. Orvis. Quoque. L. I.: Joha K. Cummiskey, Roseland Ave. garage, Caldwell, N. J.; Mr. and Mrs. Harry Stitt, 360 W. 47th St.. N. X. C.

One of many testimonials proving the superiority of A & P Sets.

-KNOCK-DOWN-SPECIAL A & P KIT FOR 5-TUBE NEUTRODYNE

All parts to BUILD one like our STANDARD NEUTRODYNE......\$32.50
Cabinet Extra

#### **IMPROVED** SUPER-HETERODYNE THE FAMOUS A & P 8-TUBE SET

in wave length. Practically FREE FROM INTERFERENCE BY CODE OR WEATHER CONDITIONS.

CONDITIONS.

Its operation is remarkably simple—only two dials control the tuning. It is the only set of its kind that reproduces MUSIC and SPEECH with just as CLEAR TONE as performed. Everyone who listens to this instrument agrees that it plays with a finer tonal quality than they have ever heard. It is as though you were present at the performance. A GREAT

#### CASH OR DEFERRED PAYMENTS

Cheerfully Arranged

OPEN UNTIL 9 P. M. GREATER ATLANTIC & PACIFIC RADIO CORP.

### At last-Radio set-building made easy/

Only two tools needed and they're in the kit~

A set that you can make

#### Anyone can put together an district amateurs present. It will be West Coast a number of times. ACMEFLEX KITSET

ITH an Acmeflex Kitset you can put together the famous Acme 4-tube "Reflex" in one evening. Complete directions, simple and easy to follow, are given with the kit. No soldering, no workshop, no technical knowledge required.

All the parts needed are in the Kitset-wires, loop, sockets, drilled panel and baseboard—everything. The only accessories to get are tubes, batteries, loudspeaker and cabinet.

The set is so simple that your wife and the kiddies can use it. You can hear everything on a loudspeaker and have "all the year round radio." Price: \$65.00 Send for descriptive circular. ACME APPARATUS COMPANY, Dept. 12B, Cambridge, Mass.



"PAL" HEAD PHONES
AT LAST THE FORD IDEA HAS BEEN
BROUGHT INTO THE RADIO FIELD Only by tremendous volume and standardized parts is it possible to produce a pair of phones which have HIGH QUALITY AT LOW PRICE Write or call for our New Complete Catalog MANHATTAN RADIO CO.



viated linguistic manipulation. In dling traffic.-FB OM.

other words, they are not understood, stand.

already acquainted with radio short- as yet we have not heard it. hand is to learn it. These nicknames are evidence of familiarity with the radio art which was uncinctly express what is meant.

Take, for instance, "broadcast listeners." Is it not much easier and simpler to get the thought over by merely saying "BCL"? The whole name for "amateur radio operator" much qrm, but raises 'em. may be expressed by the simple word "ham." If you are continually talk-

Besides these idioms there is a long list of "Q" abbreviations that are used in international radio telegare used in international radio teleg-raphy and may be applied equally

He uses phone occasionally and the

ventions that won't work, and worthwell to radio telephone or broadcast modulation is very good. We underless stock. They talk smoothly, proference, and "QRN" means interference from static. With a thorough lator. knowledge of this shorthand the rapid development of the age.

ever. He is still using a CW set em- looks like a promising relay station cumulated by years of hard work and ploying two five-watt tubes. For for the coming fall. local work a chopper is used which has been found very convenient for calling local stations.

amateurs in his vicinity on his recontinues to be qso, however, and has ried away with the idea that if one ceiver. He says several stations have handled considerable traffic across the set can be built at a stipulated price, been worked and 2EX reports him very loud. In the set a single WD-11 with a 22½-volt "B" battery was

2BAW does not regret the installing of a rectifier on his transmitter. With much less plate voltage on his fifty-watt tube he has worked every district but the sixth several times in the former.

2BGD. The transmitter used employs Glad to hear you back OM. a pair of five-watt tubes connected in a reverse feedback circuit. With not overheat.

Virginia, Kentucky and Tennessee. OM? However, stations in Texas and other

held at the town of Poultney, Vt. For further information regarding the above address a letter to radio 1AJG, Charles Kerr, Depot Square, transmitter and is now set for all edge. Poultney, Vt.

last two weeks. An amateur trans- M., and oftener if necessary. mitter, employing two five-watt tubes and operating under the call A station in the third district that pounds through the local static with Also a Reinartz receiver was used. Also a Reinartz receiver was used.
With an antenna about eighteen feet new self-rectifying set using two fivein height stations in the eighth and watt tubes is used at this station. are making 1924 summer sales proitable. Portable sets for summer ninth districts were worked. How- Fine results have been obtained so ever, it was found difficult to commu- far. nicate with amateurs in the vicinity

few weeks at a Jersey shore resort. tions on the West Coast were worked years. Not only in homes, but in One walking along the Boardwalk ten times within fifteen days. This schools, churches, auditoriums and would not have any difficulty in lo- shows how good the small tubes are hotels radio will take its place as cating him, as he wears a sweater for reliable communication. that has his call on the back in big red letters-MIM.

Another station that has been ing that his counterpoise was only ten honestly made-but there will be mildoing some very good work of late is feet below his aerial. He was very lions lost unless the investor is on 2CIL. With two five-watt tubes he as considering the antenna system the alert and doesn't allow himself has been able to carry on two-way used. communications with stations in the

2BBX is using what we believe to from 8ZY and had the misfortune to to the public for its financing, very

HE amateurs are being severe- time trouble is being experienced in Another ninth district spark staly criticized by radio enthu- obtaining a good DC note. Very tion that is heard occasionally in the siasts because of their abbre- good results have been had both in second district is 9CGX. An old-half

and as a rule most persons are sus- 2CTL and 2CRW have been staying heard him say he thought he would picious of what they don't underdays. We understand CRW has a Mim. Our advice to those who are not small transmitter in operation, but

Girt John Arsics, of 2XBF, returned was using one five-watt tube with known to the past generation. Just home last Saturday. He also had a 500 volts of rectified AC on the plate. as two or three slang words picture nice 100-watt CW set installed in a A number of experiments on short an idea better perhaps than a long paragraph, so does a mode of expression peculiar to radio more succinctly express what is meant.

2AEL is doing very good work with "ham." If you are continually talking about your long distance reception you can save time by saying or writing "DX"

Radio is a marvelous distance reception power. He seems to be on the air almost any time of day and is working 'em in fine style. This standard with almost unlimited uses, but in every age there are thousands of persons who grab frenziedly at any possition also has a sharp, clear note. 2ACT is back on the air again.

an oscillator and another &s a moduamateur and novice would understand 2AU is a new station on the air. ture comfort and perhaps luxuries, each other and be living up with the He is using several of the small size "invest" their small capital so se-

working the west coast has been sible plan for building radio appagradually dropping off ever since the ratus at little cost but immense prof-2CTQ has been trying to work warm weather set in. 2CEE still it Inexperienced enthusiasts get car-

> He may be heard most any time of principal the evening working eighth and ninth | Amateurs experimenting make "disdistrict stations.

2AGB has again returned to brass and seventh, and has been reported pounding after completely overhaul-Another station that has been again, but judging from the sound he not be given too careful scrutiny by a handling considerable traffic lately is is still using the same 250-watt tube. would-be investor. The stable manu-

A station with an exceptionally a medium plate voltage the tubes do good CW note is 2TT. We heard him though responsible designers have 2ADU has been experiencing diffi- mistaken TT is using storage bat- reckoning is surely dawning when culty in working stations in West teries for plate supply. Is that right those epportunists who are madly

with ease. Has any one else found this to be a dead spot also?

Western states have been worked was heard to say the other ment-granted rights to existing intentions.

I ment-granted rights to existing intentions.

transmitter and is now set for all edge. in the quickest possible time, and will young to have a background upon maintain schedules every Tuesday and which one may base comparisons. 2CQZ has been at Sea Girt for the maintain schedules every ruesday and which one may base comparisons. Friday nights from 11:30 to 2:30 A. Last year was unlike the year before,

A station in the third district that

A remarkable feat was recently accomplished by 9DYT. With only one bound to be a radio receiver in al-2BZJ has been spending the last five-watt tube running very cool sta- most every home within the next few

surprised when 9ELL was heard say- any worth-while invention that is

irst and third districts in daylight. Some amoteurs sure do have hard It is impossible to get something luck. 8FU borrowed a 50-watt tube for nothing; and when a concern goes

the air now with a 250-watt tube of

If any stations have traffic bound for the west coast they should give it to 8BYN for quick delivery. He maintains regular schedules with a number of west coast stations, especially 6AHP.

working distant stations and han- KW transformer is used with a "sink" gap. This is one of the last of the ninth district sparks, and we

The other night we heard 9DWW on a very short wavelength attempt-After a delightful two weeks at Sea ing to handle traffic. He said he

#### 2CVH was heard the other day Beware of the Radio Gold Brick

By M. RANKIN

Radio is a marvelous discovery sons who grab frenziedly at any possibility of getting rich quick and who flood the country they happen to be reception. "QRM" designates interconvince the gullible and impoverish a pathetically large number of innocents who, with the prospect of futubes in parallel and no trouble is curely that they never see it again.

being experienced in working eighth It is astonishing the number of 2CUA is back with more "pep" than and ninth districts. This station keen-minded men, with fortunes acamounts into so-called gilt-edged se-The number of amateur stations curities, or are financing some imposa number can be built for even less. Manufacturing and marketing prob-

Another station doing very good lems must be solved before invest-DX work on a fifty-watt tube is 2CJJ. ments can pay back one cent on the

coveries" already patented, and unless proper licenses are secured, the manufacturer finds himself involved in a complicated and expensive maze of ing his station. He promised he would lawsuits and counter suits that are have more power before he was heard ruinous. The patent situation canfacturers have their products thoroughly covered by all the patent protection the government affords. Althe other evening working one DX been too busy to undertake the prosestation after another. If we are not cution of infringements, a day of trying to capitalize the public demand for radio will be obliged to Western states have been worked 8VE was heard to say the other answer for their violation of govern-

five feet long and forty feet high. In a recent investigation it was Vermont is going to have a state convention on the 9th of August and been able to carry on two-way comwould like to have several second munication with amateurs on the to manufacture radio apparatus. It is obvious that all of these companies could not have the essential technical skill, and failure is the reward of 1AOV has opened up with a new ignorance and lack of expert knowl-

this year is unlike last year and 1925 will be unlike any other year. The

homes and camps, besides a number of things now unrealized, will keep 1925 sales even all year. There is naturally as the telephone.

There is a great deal of money to The other morning we were "ather be made in radio just as there is in to be inveigled into buying "gold bricks."

be a 250-watt tube. At the present burn it out. However, he is back on careful investigation should be made.

#### Radio Patent Up on Appeal

Lee and Hogan Carry Heterodyne Invention to United States Court on Priority Claim

By Thomas Stevenson

forms of heterodyne circuits.

jr., both of whom represent the West- in the Court of Appeals. inghouse Electric and Manufacturing Company, over the decision of the Commissioner of Patents in granting priority to Frederick K. Vreeland, whose patents are owned by the Radio Corporation of America, for the mitting intelligence by radiant en-

The case recalls the old struggle between the General Electric Company and the Westinghouse Electric Company for supremacy in the radio field and the means by which the Radio Corporation of America rid itself of its most dangerous rival.

The General Electric Company and the Westinghouse Electric Company ceived energy as so produce beats have always been keen rivals in the electrical field. When the General Electric Company entered the radio field and helped to organize the Radio to amplify the effect of the received Corporation of America the Westinghouse company followed its example and formulated a new company, which was known as the International Radio Telegraph Company, to compete with the Radio Corporation.

the first concern to erect a broadcastratus which it then had was crude, ing it to operate an indicator. it was enabled, late in 1920, to demceeded with the development.

not get far before it learned it could the rectified current. not sell the sets it manufactured because vacuum tubes were required

Westinghouse Sells Patents

Radio Corporation whereby it agreed currents. ference proceedings were instituted during the receipt of messages." by Lee and Hogan against the claim

WASHINGTON .- The United States | of Vreeland on January 11, 1916. On Court of Appeals has just been called October 13, 1921, the Examiner of Inupon to decide the question of pri-and Hogan. On April 19, 1923, the ority on one of the most important Board of Examiners in Chief reversed radio inventions of recent years. The the decision of the Examiner of Ininvention covers the most practical terference and gave priority to Vreeland. On April 4, 1924, the Commissioner of Patents upheld the decision The appeal was filed with the court of the Board of Examiners, whereby John W. Lee and John L. Hogan upon Lee and Hogan filed an appeal

Here are the inventions covered in the case:

"1. The method of receiving oscillating current energy by first combining it with the energy of a sepainvention of "improvements in transdifferent from the frequency of received current, and then rectifying operate an indicator.

"2. The method of wireless signaling which comprises exciting a receiving circuit by the received wave energy and also by an auxiliary alternating current of a frequency so related to the frequency of the retherewith and then rectifying and

"3. The method of wireless signaling which comprises the constant production of an auxiliary oscillating current of frequency similar to that of the received signal waves, combin-The Westinghouse company was ing such auxiliary current with the received current, electrically rectifying station, and although the appa-

"4. An amplifier and discriminator onstrate to those interested in the for wireless signal receiving appararadio industry that if proper trans- tus comprising an auxiliary source mitting and receiving apparatus of current adopted to excite the recould be designed and developed, unceiving circuits with a frequency hampered by patent restraints, broad- near to and different from the frecasting would become a great public quency of the current of the reutility, and in anticipation of the patent situation being cleared up pro- rectifying the current resulting from But the Westinghouse company did rents, and an indicator operated by the combined effects of said two cur-

"5. A receiver for wireless signalcause vacuum tubes were required for their efficient operation, and the Radio Corporation owned all of these detector associated therewith, a current-operated indicator and an independent co-operating source of cur-Therefore, on June 30, 1921, the rent also associated with the an-Westinghouse company sold the pat- tenna and having a frequency differents of the International Radio Tele- ing slightly from the frequency of graph Corporation to the Radio Cor- received signaling current, so as to poration, and on the same day en- produce beats therewith and thereby tered into an agreement with the operate the indicator by the combined

to manufacture radio apparatus ex- "6. In wireless signaling apparatus clusively for the Radio Corporation. the combination with the receiving In the case filed with the Court of circuits, a detector and a current op-Appeals Lee and Hogan claim the erated indicator of a local means to Vreeland application is an infringe- generate a co-operative current and ment on a patent granted them in produce beats with the current of June, 1915. Vreeland's application the received waves whereby to conwas filed on October 27, 1915. Inter- trol the character of the signal note Copyright 1924.



The hero of what came near being a great sea disaster is the radio operator of the steamship Priscilla, the first vessel to pick up the radio call for help from the Boston, and the first vessel to reach the scene of the disaster. The radio operator, H. A. Dreisacker of the Priscilla, kent in constant communication with the Boston after picking up the SOS call for help, in this way enabling the Priscilla to pick up over 480 of the survivors.

The photograph shows H. A. Dreisacker, chief radio operator of the steamship Priscilla, and I. R. Wolfe, his assistant, in the operating room on board the boat.





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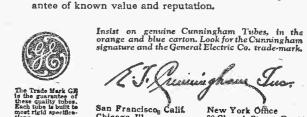
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SANFORD M. BOOKEE

# The Herald Tribune Daily Broadcasting Programs for Week Ending August 2

#### TO-DAY

\*WEAF—NEW YORK CITY—492

to 4 p. m.—Sunday hymn sing.

to 5 p. m.—Interdenominational services;
address by Rev. Claude E. Morris; music
by choir; Carlos Abba, harpist.

p. m.—'Rebuilding Jerusalem," Prof
Herbert B. Howe.

7:20 to 9:15 p. m.—Musical program from
Capitol Theater; music by artists and
selections by the Capitol Orchestra; special presentation by Mr. Rothafel of
vocal and instrumental artists.

8:15 to 10:15 p. m.—Organ recital. \*WJZ-NEW YORK CHTY-455

9 a. m.—Children's hour; original stories; music; comic stories.
11 a. m.—St. Thomas's Episcopal Church services; sermon by Dr. E. M. Stires.
2:30 p. m.—Radio Bible class; Eugene Reed, barytone; X. L. Male Quartet. Clara M. Dubois, accompanist.
2:30 p. m.—Naty Band of the Virgin. Islands.
7 p. m.—Nathan Abas's Orchestra.
7 p. m.—Wathan Abas's Orchestra.
8 p. m.—"Talk for Business Men."
8:25 p. m.—New York Philharmonic Orchestra.

\*WJY—NEW YORK CITY—405 p. m.—Mildred Steel Woods, sopra p. m.—Morris Lichtenstein, talk. m.—Mildred Steel Woods, soprano. p. m.—Sava Tcherny, violinist. p. m.—Jacques Amado, tenor. \*WHN—NEW YORK CITY—360 \*WHN—NEW YORM

3 to 4 p. m.—Theater broadcast.

9:30 p. m.—Theater broadcast.

10 to 11 p. m—Paul Specht's Orchestra.

\*WBS—NEWARK—360

1 p. m.—Robert Lair, planist.

1:20 p. m.—Marietta Cole, singing.

2-3 p. m.—Sterling Dance Orchestra.

\*WOO—PHILADELPHIA—509

2:30 p. m.—Musical exercises at session

\*WOO-PHILADELPHIA-509
2:30 p. m-Musical exercises at session
Bethany Sunday School.
6 p. m.—Sacred organ recital.
7:30 p. m.—Evening church services,
gan recital, chorus choir, Leman Str
Quartet, sermon by the pastor, the R
Dr. A. Gordon MacLennan.
\*WFI-PHILADELPHIA-395 10:30 a. m.—Church services. \*WIP—PHILADELPHIA—509

11 a. m.—Morning service. 3:30 p. m.—Afternoon concert. \*\*WGY—SCHENECTADY—380 10:30 a. m.—Service of First Presby Church.

1:30 p. m.—Concert by New York Phi armonic Orchestra. p. m.—Services, police reports, \*WGR—BUFFALO—319

3 p. m.—Vesper services. 4 p. m.—Organ recital; request number: 11:45 p. m.—Weather forecast. \*WNAC—BOSTON—278 11 a. m.—Entire service. 2:30 p. n.—Boston Band Concert. 4:45 p. m.—Entire services. \*WDBH—WORCESTER, MASS.—268 10:30 a. m.—Church service.
\*WJR—PROVIDENCE—360
7:20-9:15 p. m.—Musical program of

itol Theater.

115-10:15 p. m.—Organ recital.

115-10:15 p. m.—Organ recital.

\*WBZ—SPRINGFIELD, MASS.—337

p. m.—Rita Kerrigan, soprano.

130 p. m.—Universal hymn service, Eliza beth Bates, contralto; Arleen Taft, or ganist. \*WGI-MEDFORD, MASS.-360
p. m.-"Adventure Hour," Musicale,

talk. DARTMOUTH, MASS.—363 \*WMAF—S. DARTMOUTH, MANAGED PROPERTY OF THE PR

al solos. \*KDKA—PITTSBURGH—326 . 10:45 a. m.—Church services. 6:15 p. m.—Baseball scores. 6:30 p. m.—Radio Chapel Services. \*WCAE—PITTSBURGH—462

WCAP-WASHINGTON-469 11 a. m.—Church service.
4 p. m.—Open air service.
6:20 to 8:15 p. m.—Musical program the Capitol Theater.
8:15 to 9:15 p. m.—Organ recital.
WHAS—LOUISVILLE, KY.—400

-Beechmont Trio. WQAM-MIAMI, FLA.-283

p. m.—Musical talent from churches WEAP—MOBILE, ALA.—300 p. m.—Vesper service.

12 midnight—Musical concert.

WSB—ATLANTA—429 \$ p. m.—Smyrna, sacred quartet. \$ 30 p. m.—Wesley Memorial church

WLW-CINCINNATI-423 m.—Concert by the Western p. m.—Concert Southern Orchestra. WWJ—DETROIT—517

m.—Orchestra selections. WCX—DETROIT—517 10:30 a. m.—Services of the odist Episcopal Church; WLAG-ST. PAUL-MINNEAPOLIS-417 WIAG-ST. FAUL-MANAGE ST. 15 p. m.—Service, House of Hope Presbyterian Church.

145 p. m.—Service, Central Lutheran Church.

WMAY—ST. LOUIS—280

12 noon—Regular services of Kings Highway Presbyterian Church.

130 p. m.—"Forty-fve Minutes for Everybódy." Song service.

WHB—KANSAS CITY—411

Services at Indian Village.

9 p. m.—Services at Indian Village WDAF—KANSAS CITY—411 gram. WOC-DAVENPORT-484

m.—Sacred chimes concert.
m.—Orchestra concert.
..—Church service. 10:30 p. m.—Musical program (1½ hours WHO—DES MOINES, IOWA—526 8 p. m.—Speeches and musicales. 8:30 p. m.—Musicales. WHAA—IOWA CITY.—484

10 p. m.—Familiar hymns by Miss Meyer. WHB—KANSAS CITY—411

9:30 p. m.—Church services. WOS-JEFFERSON CITY-441 KYW-CHICAGO-536

9:30 p. m.—Dell Lampe's Orchestra 9:30 p. m.—1:30 a. m.—Dance musi WDAP—CHICAGO—360

6 p. m.—Organ recital.
10:15 p. m.—Concert by Drake Conc
Ensemble.
WQJ—CHICAGO—448 8 to 10 p. m.—Ralph Williams's Orchest
7 to 9 p. m.—Artist series program.
WLS—CHICAGO—345
WLS—CHICAGO—346

5:30 to 7 p. m.—Church choir music, WEBH—CHICAGO—370 7 to 9 p. m.—Evening artist series 7 to 9 p. m.—Evening gram; dance music.

WOAW-OMAHA-526

Padio chapel service.

10 a. m.—Radio chapel service.
10 p. m.—Musical chapel service
WFAA—DALLAS—476 7 p. m.—Radio Bible class. 8:45 p. m.—Church services; orchestra

6:30 p. m.—Concert, KGO Symphony Or-chestra.

lections.

12 midnight—Popular program.

KFI—LOS ANGELES—469 11 p. m.—Concert orchestra.
12 midnight—Bennett's Orchestra.
1 a. m.—Orchestra selections.
KGO—OAKLAND—312

chestra. KGW-PORTLAND, ORE.-492 n.—Church services.

KHJ—LOS ANGELES—395

. m.—Art Hickman's Orches p. m.—Organ recital. CKCK—REGINA, CANADA—420 p. m.—Religious services.
0:30 p. m.—Musical program.
CKCI—QUEBEC—410
1:30 p. m.—Musical evening program.

#### **MONDAY**

\*WEAF-NEW YORK CITY-492 —Sara Hammond. soprano. m.—Women's program. m.—Sara Hammond, soprano. —Waldorf-Astoria dinner mus

m.—Phillip Steele, barytone.

p. m.—Nathan Abas's Orchestra.
p. m.—Eleanor Gunn's Fashion Talk.
10 p. m.—Daily menu.
15 p. m.—"Fashions of the Stage," Cor. 30 p. m.—Nina Farchi, soprano; Pasqual Rubino, tenor.

15 p. m.—Kathleen E. Hughes, banjoist
30 p. m.—Market report.

p. m.—Market report.
 p. m.—Concert orchestra.
 p. m.—Financial Developments of

Day,

Day,

7:30 p. m.—Concert orchestra.

7:55 p. m.—'Round the World Flight,''
Major L. D. Gardner.

8:10 p. m.—Goldman Band Concert from
Mall, Central Park. German program;
Genia Fonariova, soprano.

10 p. m.—'The American Home—Will It
Survive?'' Professor Binder.

10:15 p. m.—'Field and Stream'' sport
talk.

0-11 a. m.—'Woman's Hour.'

115 p. m.—Jimmy Clarke's Entertainers.

146 p. m.—Popular songs, Harry Hock.
p. m.—L. Wolffe Gilbert, singing.

146 p. m.—Chat with children.
p. m.—Leon Stein, barytone. 4 p. m.—Leon Stein, barytone.
4:15 p. m.—Alex Aranyossy, violinist.
4:30 p. m.—Musical program.
6:45 p. m.—Musical program.
6:7 p. m.—Olcott Vail's Trio; jests; talks songs, dance music.
7 p. m.—"Sport Period."
130 p. m.—Bedtime stories.
140 p. m.—Roseland Dance Orchestra.
15 p. m.—People's popular concert.
16 p. m.—People's popular concert.
17 p. m.—Beople's popular concert.

p. m.—People's popular concert. 40 p. m.—Vincent Lane, Irish tenor: bo

135 p. m.—Wright and Bessinger, ha mony singers. 150 p. m.—Charles L. Ragot, vocalist. 10-11 p. m.—Talk and musical program 12 p. m. 2 a. m.—Midnight Bohemia Sho \*WOR—NEWARK—405

12 p. m.-2 a. m.—Midnight Bohemia Show.

\*WOK—NEWARK—405
2:30 p. m.—Talk, by E. Jerry Tracy.
2:45 p. m.—Byrd Platt Lathrop, pianist.
3 p. m.—Violin solos, Ruby Gerard.
3:15 p. m.—Talk, by Alice McKay Kelly.
3:30 p. m.—Byrd Platt Lathrop, pianist.
3:45 p. m.—Violin solos, Ruby Gerard.
6:15 p. m.—Violin solos, Ruby Gerard.
6:15 p. m.—Elite Orchestra.
7:20 p. m.—Elite Orchestra.
7:20 p. m.—Essume of day's sports.
8 p. m.—"Fancy Diving and Swimming."
Frank E. Dalton.
Frank E. Dalton.
8:30 p. m.—Story by Major C. E. Russell.
8:30 p. m.—I'l See by the Papers." "Hollywood" McCosker.
8:45 p. m.—Mario Cutayar, tenor.
9 p. m.—Dr. Signund Spaeth, "Common Sense of Music."
9:30 p. m.—Carolinians Dance Orchestra.
10:30 p. m.—Carolinians Dance Orchestra.
11 a. m.—Piano recital.

11 a. m.—Piano recital. 8 p. m.—Renald A. Sauer's Orchestra. by Colonel Valentine.
\*WBS-NEWARK-360

l a. m.—Piano recital.
-2:15 p. m.—Popular music.
•WOO—PHILADELPHIA—509

2 noon—Luncheon music.

446 p. m.—Grand organ; trumpets,

30 p. m.—Sports results; dinner music.

15 p. m.—Organ recital.

45 p. m.—Musical program,

10 p. m.—Theater orchestra,

0:00 p. m.—Dance program.

\*WFI—PHILADELPHIA—395 \*WFI--PHILADELPHIA-5393
p. m.—Meyer Davis's concert orchestra.
p. m.—Talk, by Mrs. Montrose Grahan
Tull; Patsy Beason, soprano; Fred M
Voss, pianist; Loretta Kerk.
5:30 p. m.—Meyer Davis's concert orches

tra; sports results.
\*WIP—PHILADELPHIA—509

\*WIP—PHILADELPHIA—DUS
0 a. m.—Seashore gossip.
p. m.—'What Wild Waves Say."
:05 p. m.—Visiting artists' chats.
:30 p. m.—Concert, Comfort's orchestrations p. m.—Frisco gerenaders.
p. m.—Bedtime stories.
\*WDAR—PHILADELPHIA—395
12 noon—Organ recital: features; con 2 noon—Organ recital; feat orchestra. -3 p. m.—Concert orchestra.

p. m.—Concert orchestra. :30 p. m.—Artist recital. :30 p. m. — Features; overture; danc music; Benson Chicago Orchestra, and Charley Fry's orchestra.

10 p. m.—Concert orchestra.

\*WGR—BUFFALO—319

12:30 p. m.—Organ recital.
6:30 p. m.—Vincent Lopez's Dance Orchestra. 130 p. m.—Day's news; Daseban 5511 p. m.—Sixteen musical treats.
11 p. m.—Vincent' Lopez's Dance C a. m.—Day's news; baseball scores.

chestra.
\*WRW—TARRYTOWN, N. Y.—273 p. m.—Children's stories; music. p. m.—Reports; music; scores. 30 p. m.—Musical program. ) p. m.—Musical program. \*WGY—SCHENECTADY—380

p. m.—Music and talk. p. m.—Review of week's sports. 45 p. m.—Musical program. \*WHAZ—TROY, N. Y.—380 o p. m.—Concert program by Josephin Thayer, mezzo soprano; Mrs. Edward M Fawcett, pianist; Miss Isabel Merwitz reader, and Gertrude Colbert, songste and pianist.
\*WABL—STORRS, CONN.—283

\*WABL—STORRS, CONN.—2 8:15 p. m.—State market reports. \*WNAC—BOSTON—278 1 p. m.—Shepard Colonial Orchest 4 p. m.—Copley Plaza Trio, 6 p. m.—Children's half hour. 6:30 p. m.—WNAC dinner dance. p. m.—To be announced. \*WBDH—WORCESTER, MASS.—268

\*WBZ—SPRINGFIELD, MASS.—337 p. m.—Dinner concert.
p. m.—Baseball results.
10 p. m.—"Bringing the

p. m.—Concert. \*WMAF—S. DARTMOUTH, MASS.—363 w.max.—s. DARTMOUTH, MASS.—363 8 p. m.—Dinner music. 7:30 to 8:30 p. m.—Florence Hendrickson. contraito; Philip Steele, barytone, accompanied by A. V. Llufrio. 1:30 to 10 p. m.—Concert by U. S. Marine Band.

\*WTAT-BOSTON-244 8 to 11 p. m.—Vocal and instrumental WHAS-LOUISVILLE, KY.-400

10 p. m.—Songs by Miss Blad Laplume. 10 p. m.—Talk by L. Dow Covington. \*KDKA—PITTSBURGH—326
p. m.—Scalzo's Orchestra.
p. m.—Scores, inning by inning.
p. m.—KDKA Symphony Orchestra.
m.—Scores, dinner concert. n.—Scores, dinner concert.

m.—The children's period.

m.—KDKA Symphony Orchestra. \*WCAE—PITTSBURGH—462

m.—Dinner concert.
m.—Uncle Kaybee.
m.—Baseball scores.
.—Radio ukulele lesson, 30 p. m.—Musical program. P. m.—Outdoor concert b

30-9 p. m.—Outdoor concert by United States Marine Band. p. m.—"The Sphinx," by L. Dow p. m.—Musical selections. p. m.—Frederic J. Haskin, f Standards." p. m.—Musical selections.

\*KQV-PITTSBURGH-270 m.—Music; sunset stori m.—Song review, m.—Artists' program. WRC-WASHINGTON-469

m.—Piano recital, m.—Talk by Mrs. p. m .- Stories for children.

WMC-MEMPHIS-500 WQAE—SRRINGFIELD, VT.—275

WCAO—BALTIMORE—360
2:05 p. m.—Musical program.
p. m.—Concert by artists.
p. m.—Maryland Merrymakers'
Orchestra. WQAM—MIAMI, FLA.—283
25 to 9 p. m.—Band music.
WSAI—CINCINNATI—309

WLW—CINCINNATI—423
p. m.—Grand Opera; Alvin
Music Makers; opera, continued. WWJ-DETROIT-517

-Baseball scores. m.—Schmeman's Concert Band. WCX-DETROIT-517 .—Dinner concert. .—Musical program; Frank Kain's WLAG-ST. PAUL-MINNEAPOLIS-417 WDAF-KANSAS CITY-411

 Orchestra selections; n
 m
 Nighthawk frolic. WOC-DAVENPORT-484 m.—Sport news.
m.—Musical program.
m.—Tri-City musical numbers. WHO-DES MOINES, IOWA-526 n.-Musical program. --Musical program.

WOS-JEFFERSON CITY-441 KYW-CHICAGO-536 :45 p. m.—Children's bedtime story.
WMAQ—CHICAGO—448 WOAW—OMAHA—526

10 p. m.—Randall's Orchestra.
p. m.—Bob Lee's Jazz Band.
WGAZ—SOUTH BEND, IND.—360
10 10 p. m.—Big Five Orchestra, Indis
Four Quartet.
KFKX—HASTINGS, NEB.—286 :15 p. m.—Organ recital. p. m.—Musical program. WFAA—DALLAS—476

n specialties. KGO—OAKLAND—312 1 p. m.—Educational programsical numbers.

KPO—SAN FRANCISCO—423

Budy Seiger's Orchestra. p. m.—Rudy Seiger's Orchestra.
p. m.—Organ recital.
a. m.—Max Bradfield's Band.
KHJ—LOS ANGELES—396

http://www.nucles-opp.m.—Carl Ahen's Orchestra.
KKI—LOS ANGELES—469
m.—Red Loring Orchestra.
m.—Cocoanut Grove Orchestra.
\*CKAC—MONTREAL—425
m.—The Paragent Orchestra

15 p. m.—The Dansant Orchestra.
6-kw—TUINUCU, CUBA—38;

TUESDAY

\*WEAF-NEW YORK CITY-492. "WEAF—NEW YORK CITY—492.

"Books," Dr. William Otts.
1:35 a. m.—Wanton Pictures," Adele
Woodard.
1:50 a. m.—Market and weather reports.
4:0 p. m.—Moonlight Instrumental Trio.
4:40 p. m.—Children's stories.
5 p. m.—Waldorf-Astoria dinner music.
7:30 p. m.—Lilli Maurer Offen, soprano.
7:40 p. m.—Carlo Restivo, accordion player.
7:55 p. m.—"Closs-Uns of O. Heaving.

m.—"Close-Ups of O. Henry's Life am W. Williams. . m.—Lilli Maurer Offen, soprano. p. m.—Carlo Restivo, accordi player.
35 p. m.—James R. Caffrey, barytone.
50 p. m.—Orchestra; dance music.
20 p. m.—James R. Caffrey, barytone. to 10 p. m.—Hotel orchestra. \*WJZ—NEW YORK CITY—455

p. m.—Trio.
p. m.—Eleanor Gunn's fashion talk.
15 p. m.—Daily menu.
15 p. m.—Navy Band of Virgin Islands
130 p. m.—Market reports. 30 p. m.—Market reports.
p. m.—"Dogs—The German Shepherd Dog," by Frank Dole, of the New York Herald Tribune.
20 p. m.—Financial developments of the day.

day. :30 p. m.—Orchestra. :30 p. m.—New York Philharmonic O 130 p. m.—New fork Fillinarmonic Or-chestra.
0:10 p. m.—Talk.
10:25 p. m.—The Radio Franks—Wright and Bessinger.
10:45 p. m.—Roger Wolfe's Orchestra. \*WJY-NEW YORK CITY-405 1:30 p. m.—Billy Wynne's Orchestra.
1:15 p. m.—"Bobby Burns of America,"
Professor Driggs.
1:30 p. m.—New York University Summer School concert; Lycli Barber, pianist.
10 p. m.—"What Determines the Deadlines of an Eectrical Shock," by George M. Ogle.

\*WHN-NEW YORK CITY-360 \*WHN-NEW YORK CITY-860

10-11 a. m.—"Woman's Hour."
2-3:15 p. m.—Overture and vaudeville.
1:45 p. m.—Irving Miller, barytone,
4 p. m.—Boy's period.
4:15 p. m.—Joint recital: Samuel Shankman, pianist; Arcady Berkenholtz, violinist.
4:45 p. m.—Loretto C. Lynch, "Tea Time Talk." Talk."

5-7 p. m.—Rhythm Kings.

5-7 p. m.—Olcott Vail's Trio: Jests, talks, songs, dance music.

130 p. m.—Palisades Park Orchestra.

10 p. m.—Ethel Travers, soprano.

10:16 p. m.—Bulliam B. Krigger, barytone.

10:25 p. m.—Baseball statistics.

10:30 p. m.—Bertram J. Goodman's Orchestra.

chestra. 11 p. m.—Judith Roth, Al. Wilson, singing. 11:15 p. m.—Abner Silver, singing. 11:30 p. m.—Club Alabam Revue.

All Other Programs Are in Eastern Standard Time

7:20 p. m.—Resume of day's sports.

\*WBS—NEWARK—360

11 a. m.-12 noon—Dance music.

1-2:15 p. m.—Popular music.

7:30 p. m.—Jimmy Moore, Al Lang.

7:45 p. m.—Ben Friedman and Dick Finch.

8:10 p. m.—Margaret Wright, pianist.

8:25 p. m.—Bob Schafer and Dave Ringel.

8:30 p. m.—Sammy Smith, James Bennett.

8:40 p. m.—Miss E. Retzler, pianist, and

Mrs. Robert Schafer.

8:50 p. m.—Mountainview Orchestra. WJAX—CLEVELAND—390 WWJ-DETROIT-517 WCX-DETROIT-517 WOC-DAVENPORT-484 o p. m.—Mrs. Bob Schaefer, Bob Schaefer and James Brennan in popular Lirs.

0:30 p. m.—Entertainment by Jimm m.—Chimes concert —Sport news.

WHAA-IOWA CITY-484 WLAG-ST. PAUL-MINNEAPOLIS-417 :30 p. m.—Farm lectures.

WDAF—KANSAS CITY—411

WDAF—KANSAS CITY—411 p. m.—Plano serces and music. KYW—CHICAGO—536

\*WFI—PHILADELPHIA—395 p. m.—Meyer Davis's Concert Orchestra.
p. m.—A message to the women; Margarita Parkinson, violinist; Marie Nelson, soprano; Caroline Hoffman, pianist; talk, Mrs. George Long.
130 p. m.—Meyer Davis's Orchestra; sports results. artists. WEBH-CHICAGO-370. p. m.—"Sunny Jim—the Kiddie's Pal." p. m.—Addresses, Dr. Frank Aydelotte. 30 p. m.—John Vandersloot, bass Loretta Kark, planist. 11:30 p. m.—Banjo solos; dance orchestr 11:30 p. m.—Songs; dance orchestra. WMAQ—CHICAGO—448 6:30 p. m.—LaSalle Orchestra. 9 p. m.—Civil Service Commission talk. 9:15 p. m.—Miss Coral Goris, mezzo-i prano. \*WIP—PHILADELPHIA—509

10 a. m.—Seashore gossip.

1 p. m.—Organ recital.

3:05 p. m.—Visiting artists; chats.

3:30 p. m.—Concert, Comfort's Orchestre.

6:05 p. m.—Bedtime stories.

8 p. m.—Comfort's Orchestra.

8:50 p. m.—Vessella's Concert Band.

10 p. m.—Bob Leman's Dance Orchestre.

11:05 p. m.—Bore music. prano. WLS—CHICAGO—345
5:30 midnight—Music; farm radio course in concrete; "Ger. Music Masters"; grand opera stars, WDAP—CHICAGO—369

\*WDAR—PHILADELPHIA—395 1:45 a. m.—Daily almanac. 2 noon—Organ recital; features; conc orchestra.

3 p. m.—Concert orchestra.

30 p. m.—Artist recital.

p. m.—Educational talks. 45 p. m.—Baseball scor \*WGR-BUFFALO, N. Y.-319

2:30 p. m.—Organ recital. :30 p. m.—Address. :30 p. m.—Vincent Lopez's Dance chestra.
\*WGY—SCHENECTADY—380
p. m.—Music and talk.
p. m.—Dinner music by Joseph Chickene.
30 p. m.—Concert by the New York
Philharmonic Orchestra.
1.15 p. m.—Organ recital by Stephen E.
Raiselair.

p. m.—The "So This Is Politics" Company.

:30 p. m.—The Troubadors Dance Orches tra. 6:15 p. m.—Harry Cox's Orchestra. 7:20 p. m.—Resume of day's sports.

\*WAAM—NEWARK—263

\*WBZ—SPRINGFIELD, MASS.—337 \*WBZ—SPKINGFIELD, MASS.

p. m.—Leo Reisman Ensemble.

30 p. m.—Leo Reisman Orchestra.

30 p. m.—Bedtime story.

40 p. m.—Copley Plaza Ensemble.

p. m.—"Allas Irish Tessie," presente
Albert Cowies players. \*WGI-MEDFORD, MASS.-360

\*Wui-Market reports.

15 p. m.—Code practice lesson.

30 p. m.—Musicale; business report.

\*WMAF—S. DARTMOUTH, MASS.—363 p. m.—Dinner music.
30 p. m.—Lilli Mauer Offen, soprano.
40 p. m.—Carlo Restivo; accordion player.
55 p. m.—"O. Henry's Life," by William.
W. Williams.

V. Williams,

0 p. m.—Lilli Mauer Offen, soprano.
0 p. m.—Carlo Restivo, accordion player
15 p. m.—James R. Caffrey, barytone.
150 p. m.—Orchestra selections.
150 p. m.—James R. Caffrey, barytone.
150 p. m.—James R. Caffrey, barytone.
150 p. m.—Orchestra selections.

250 p. m.—Orchestra selections.

251 p. m.—Shepard Colonial Orchestra. p. m.—Shepard Colonial Orchestra, p. m.—Shepard Colonial Orchestra. 30 p. m.—WNAC dinner dance. 10 p. m.—Boston American Orchestra \*WDBH\_WORCESTER, MASS.—268 p. m.—Musical selection. m.—Musical selections.
\*WJAR—PROVIDENCE—360

\*WJAR—PROVIDENCE—360

1:05 p. m.—Orchestra selections.
7:30 p. m.—Scores; musical program.
\*KDKA—PITTSBURGH—326

1::15 p. m.—Scalzo's Orchestra.
3:15 -p. m.—Scalzo's Orchestra.
6:30 p. m.—Organ recital.
7:30 p. m.—The children's 'period.
8:15 p. m.—Lecture by S. H. Williams.
9 p. m.—KDKA String Quartet. m.—Concert. \*WCAE—PITTSBURGH—462

. m.—Dinner concert, . m.—Uncle Kaybee. m.-Musical program.
\*KQV-PITTSBURGH-270 4:30 p. m.—Music; sunset stories.
\*WQAN—SCRANTON, PA.—280

m.—Musical concert. \*WDBC—LANCASTER, PA.—258 11:30 a. m.—Musical numbers.

WRC—WASHINGTON—469 m.-Children's hour.

m.—Baseball scores.

—A political talk by John E. Nevin.
m.—Dorothy D. Wilson, contralto.
m.—Plano recital.
m.—Artie Faye Guilford, soprano.
n.—To be announced.
m.—Irving Boernstein's Trio.
WHAS—LOUISVILLE—400
m.—Dick Quinlan's Orchestra. p. m.—Dick Quinlan's Orchestra. :30 to 10 p. m.—Roberta Gardner chestra. WMC MEMPHIS 500 :30 p. m.—Program to be announced. 2 midnight—Midnight Frolic. WLW—CINCINNATI—423

p. m.—Piano, violin, phone and vocal solos.
1:15 p. m.—Piano solos.
1:55 p. m.—Chubb Steinb m.—Chubb Steinberg's Orches
WSAI—CINCINNATI—309 m.—Gibson Orchestra.
p. m.—Chimes concert.
p. m.—Barytone solos, Richard Se bold.
p. m.—Gibson orchestra.
p. m.—Address, Myers Y. Cooper.
10 p. m.—Mixed quartet.

TO-DAY
Wave
Station. length. Orchestra.
WBS 360 Sterling
WHN 360 Paul Specht's

Frisco Serenaders Elite Vincent Lopez Westminster Paul Specht's Roseland

Roseiand
Brunswick
Palisades Park
Carolinians
Benson and Fry's
Candelori's
Ernie Golden's
Vincent Lopez
Blue Ridge
Ed Freshney's
Candelori's
1111. y 29

Harry Cox's Vincent Lopez

MONDAY, JULY 28

\* Means Daylight Saving Time

9:45 p. m .- Henny Cogert and Chas. Hirs m.—Songs; piano and soprano sons; Joe Smith's Dance Orchestra.

:45 p. m.—Children's bedtime story, p. m.—Dinner concert by Clyde Doerr's and Paul Whiteman's "Collegians." to 8:45 p. m.—Musical program by 7:30 p. m.—Piano selections, guitar. cor cert orchestra.
3:30 p. m.—Banjo solos; dance orchestra.

p. m.—Dinner concert.
p. m.—Organ concert.
p. m.—Chapman's Dance Orchestra.
WQJ—CHICAGO—448 WQJ—CHICAGO—448.

10 to 2 p. m.—Ralph Williams's Orchestra
WOAW—OMAHA—526.

7:30 p. m.—Russ Townsend's Orchestra.
10 p. m.—Church orchestra. 10 p. m.—Evening musical program. WGAZ—SOUTH BEND, IND.—360 0 p. m. to 1 a. m.—Orchestra selecti KFKX—HASTINGS, NEB.—286 m.—Midnight concert. WFAA—DALLAS—476

chestra. KGO-OAKLAND-312 1 p. m.—Arion Trio; quartet solos, to 4 a. m.—Henry Holstead's Dano chestra. KPO—SAN FRANCISCO—423

p. m.—Rudy Seiger's Orchestra, p. m.—Scotch program. m.—Max Bradfield's Band. KGW—PORTLAND, ORE.—492 :30 p. m.—Baseball scores.
p. m.—George Webber's Orchestra.
KHJ—LOS ANGELES—395 Art Hickman's Orchestra.

KFI-LOS ANGELES-469

Examinar-Highland Park Lawrence Lambert's Orchestra \*CKAC—MONTREAL—425

p. m.—Kindles stories, 130 p. m.—Concert. 130 p. m.—Varieties. 0:30 p. m.—Cabaret from roof garden

WEDNESDAY

\*WEAF-NEW YORK CITY-492 1 a. m.—Minnie Well, planist.
1:10 a. m.—"Young Mother's Program,"
talk by Mrs. Louis Jersawit.
1:50 a. m.—Market and weather reports.
p. m.—Elsie Ahrens, soprano.
1:5 p. m.—Benjamin Lucatorto, planist.
1:30 p. m.—Charles A. Schenck jr., barytone.

130 p. m.—Charles A. Schenck jr., barytone.
140 p. m.—Stories for children.
5 p. m.—Waldorf-Astoria dinner music.
7 p. m.—Synagogue services.
130 p. m.—Joint program. Hilda Ramon,
Charles Bryden.
150 p. m.—'Sunmer Care of Bables,"
Dorothy Deming.
8 p. m.—Louis Goldberg, violinist,
15 p. m.—Joint program, Hilda Ramon,
Charles Bryden.
130 p. m.—'The Twins."
9 p. m.—Scott Blakeley, Scotch comedian,
tenor.

15 p. m.-Louis Goldberg, violinist. p. m.—Dance music. \*WJZ—NEW YORK CITY—455 p. m.—Trio.
p. m.—Eleanor Gunn's fashion talk.
110 p. m.—Dally menu.
115 p. m.—Talk, John C. Cutting.
140 p. m.—"Education." Mrs. Johnson.
150 p. m.—Anthony Reale, violinist.

the day,
30 p. m.—Cafe ensemble,
100 p. m.—"Music Appreciation," Pr
R. A. I. Smith,
130 p. m.—Band contest and chorus,
130 p. m.—Billy Wynne's Orchastra

R. A. L. SIMIN.

10:30 p. m.—Band contest and chorus.

10:30 p. m.—Billy Wynne's Orchestra.

\*WHNN—NEW YORK CITY—360.

10-11 a. m.—"Woman's Hour."

2:15 p. m.—Woiscal program.

2:45 p. m.—Original Louisiana Five.

3:45 p. m.—Uncent Lane. tenor.

4 p. m.—Boy's period.

4:15 p. m.—Joint recital.

4:45 p. m.—Lionei Adams, reading.

4:50 p. m.—Boots Fowler, barytone.

6-7 p. m.—Olcott Vail's Trio. Jesti

talks; songs; dance music.

7 p. m.—Sport period.

7:30 p. m.—Bedtime stories.

7:40 p. m.—Rossland Dance Orchestra.

8 p. m.—Period for shut-ins.

8:30 p. m.—Olc. Wolfe, barytone.

9:15 p. m.—Jos. C. Wolfe, barytone.

9:15 p. m.—Palisades Park Orchestra.

Paul Specht's
Harry Cox's
Graystone
Mountain View
Palisades Park
Graystone
Bob Leman's
B. J. Goodman's
Roger Wolfe's
H. Marburger's
Chubb-Steinberg

Eddie Elkins's

Eddie Elkins's
Baudistal's
Checker Inn
Vincent Lopez
Paul Specht's
Roseland
Gene Ingraham's
Codes-Marks
20th Cent. Sextet
Palisades Park
Codes-Marks
Billy Wynne's
Vincent Lopez

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WOR WNAC WGR WHN WHN WOAR WJAR WAAM

WEDNESDAY, JULY 30

509

singing.
10 p. m.—Gene Austin, barytone.
10:10 p. m.—Baseball statistics.
10:15 p. m.—Tom Bracken, Bob King popular songs. \*WAAM-NEWARK-263 8:45 p. m.—Twentieth Century Sextette. 9:46 p. m.—Judith Roth, singing. 10 p. m.—Al Wilson. 10:16 p. m.—Herman Engler, popular nun

\*WOR-NEWARK-405 \*WOR—NEWARK—440
3:30 p. m.—Eunice Pilkington, contralto
3:45 p. m.—Stanley J. Martuszewski, ac
companied by Joseph Zbytniewski.
6:15 p. m.—Baudistel's Park Orchestra.
6:55 p. m.—Resume of day's sports.
8 p. m.—Gene Ingraham's Orchestra.
8:20 p. m.—Joint recital by Helen O'She

in.—Gene Ingraham's Orchestra.

1:30 p. m.—Joint recital by Helen O'Shea
and Marguerite Sinton.

p. m.—Solos by Millie Kreuder.

1:15 p. m.—Talk by Honor Major George
Haven Putnam.

1:45 p. m.—Joint recital by Helen O'Shea
and Marguerit Schale 10:30 p. m.—Contractor Sinton.

10:35 p. m.—Contractor Solos, Antonio Pesci.

10:30 p. m.—Contractor Solos, Millie Kreu-

p. m.—Antonio Pesci, tenor. \*WOO-PHILADELPHIA-509 m.—Grand organ, trumpe m.—Sports results, police

wy p. m.—Organ recital.

WFI—PHILADELPHIA—395

p. m.—Musical talks, Mary Comerfor McGarter; contralto; trumpet duets
Mabel Swint Ewer and Catherine Heuser ser. :30 p. m.—Meyer Davis's Concert Or

p. nt.—nt., stra; sports results.
\*WIP—PHILADELPHIA—509
-Eddie Elkins's Orchestra m.—Bedtime stories.
\*WDAR—PHILADELPHIA—395 noon—Organ recital; religious service.
o 3 p. m.—Arcadia Concert Orchestra.
0 p. m.—Artist recital; baseball score:
0 p. m.—Dream Daddy.
0 m.—Arnold Abbott; concert music

\*WGY—SCHENECTADY—380 \*30 p. m.—Adventure Story.
\*WRW—TARRYTOWN, N. Y.—278 p. m.—Children's stories; music. p. m.—Police reports; music; scores. 30 p. m.—Musical program. \*WGR—BUFFALO—319

m.—Billy Russell, mustreller, banjo and ukelele.

m.—Reader, John N. Dodsworth.
m.—Reader, L. C. Rosenbloom.
p. m.—Musical program.
m.—Vincent Lopez's Orchestra.

\*WABI.—STORRS, CONN.—283

—State market report. 5 p. m.—State market report.

\*WBZ—SPRINGFIELD, MASS.—337

\*WMAF—S. DARTMOUTH—363

sses. n.—Walter Leary, barytone; El

ra Frantz, pianist, \*WGI-MEDFORD, MASS.-360 15 p. m.—Market reports.
30 p. m.—Musicale: song hits.
\*WNAC—BOSTON—278 m.—Shepard Colonial Orchestra.
p. m.—Popular songs.
n.—Shepard Colonial Orchestra.
n.—Shepard Colonial Orchestra.
n.—Children's half-hour.
p. m.—WNAC dinner dance.
n.—To be announced p. m.—To be announced. \*WDBH—WORCESTER, MASS.—268

\$:05 p. m.—Twenty-six musical sele-by church choir. \*WJAR—PROVIDENCE—360 130 p. m.—Hilda Ramon. soprano, a: Charles Bryden, tenor. 156 p. m.—Louis Goldberg, violinist. 115 p. m.—Hilda Ramon and Charle Rayden 30 p. m.—Cords-Marks Dance Orches p. m.—Scott Blaxley, comedian, 116 p. m.—Louis Goldberg, violinist, 130 p. m.—Cordes-Marks Dance Orchestr \*KDKA—PITTSBURGH—326

12:15 p. m.—Daugherty's Orchestra.
6 p. m.—Baseball scores.
6:30 p. m.—Dinner concert. j. 30 p. m.—The cantal a second p. m.—Concert: Mildred I. Pront Leona La Martin, Agnes Tillbrook, den H. Thomas and Sebastian Sapie

\*WCAE—PTTTSBURGH—462

7:45 p. m.—Baseball scores.

7:45 p. m.—Baseball scores.
9:39 p. m.—Musical progrem.
\*KQV—PITTSBURGH—270
8:45 p. m.—Song review, by Ben Fields.
9-10 p. m.—Chorus medley; prayer.
4 p. m.—Song recital.
5:15 p. m.—Instruction in international code. p. m.—Stories for children. WCAP—WASHINGTON—469

p. m.—Scott Biakeley, comedian, tenor 15 p. m.—"Science News of the Week. 30 p. m.—To be announced. WHAS—LOUISVILLE, KY.—400 p. m.—Alamo Theater orchestra.

30 to 10 p. m.—Earl Elliott's Serenader

WLW—CINCINNATI—423

p. m.—Virginia Entertainers. p. m.—Original compositions; 30 p. m.—Instrumental Trio. WWJ—DETROIT—517 3:30 p. m.—Schmeman's Concert Band. 9:30 p. m.—Orchestra selections.

Time

THURSDAY, JULY 31
WHN 360 L. Partridge's
WGR 319 Vincent Lopez
WNAC 278 Westminster
WOR 405 Tom Cooper's
WHN 360 Paul Specht's
WBS 260 Tuxedo
WHN 360 Pallsades Park
WRC 469 Pete Maclas's
WJY 405 Al Reiser's
WEAF 492 Vincent Lopez
WCAP 469 U. S. Army
WHN 360 Roseland
WJZ 465 Waldorf-Astoria
WLW 423 Doherty's
WCAP 469 U. S. Army
WHP 609 H. Marburger's
FRIDAY, AUGUST 1
WOR 405 S.S. G. Washington
WIP 609 Eddie Elkins's
WGR 319 Vincent Lopez
WNAC 278 Checker Inn
WHN 360 Paul Specht's
WJZ 465 Hotel McAlpin
WJY 465 L. Nelson's

WLAG-ST. PAUL-MINNEAPOLIS-41 p. m.—Concert.
 m.—George Osborn's Orchestra.

WOS-JEFFERSON CITY-441 m.—Address, p. m.—Barn dance tunes. WHB-KANSAS CITY-411 WDAF-KANSAS CITY-411

2 midnight—Musical program.

WOC—DAVENPORT—484
p. m.—Organ recital; Mrs. John
soprano.

KYW—CHICAGO—536 336 p. m.—Children's bedtime story.

'p. m.—Dinner concert; Joska Debary's and Paul Whiteman's "glans."

'30 p. m.—Duncan Sisters.

p. m.—Musical program.

p. m.—Musical program. :45 to 12:30 p. m.—Midnight revue. WEBH—CHICAGO—370 WEBH-CHICAGO-370
7:30 p. m.—Pianist; concert selections.
9:30 p. m.—Cellist; dance orchestra.
11:30 p. m.—Guitar duets; readings; described orchestra.
WMAQ-CHICAGO-448

WLS—CHIUAGU—345
i:30-10 p. m.—Music, lullaby time; boys'
and girls' hour; farm program; answers
to questions; farm adviser talks.
KFKX—HASTINGS, NEB.—286

15 p. m.—Dinner concert. WGAZ—SOUTH BEND, IND,—369 o 10 p. m.—Big Five orchestra. KFMX—NORTHFIELD, MINN.—233 m.—Organ recital.

KGO—OAKLAND—312
—Short musical program.

:30 p. m.—Concert orchestra. KPO—SAN FRANCISCO—423 m.—Rudy Seiger's orchestra.
m. to 1 a. m.—Max Bradfield's band
KGW—PORTLAND, ORE.—492 m.—Concert by Wendall Hall. —Dance music. KHJ—LOS ANGELES—395

m. to 1 a. m.—Songs, lecture n.—Art Hickman's orchestra KFI—LOS ANGELES—469

:15 p. m.—Musical tea.
PWX—HAVANA—400 8:30 to 11 p. m.—Band concert.
WKAQ—PORTO RICO—360
7 to 9 p. m.—Musical program.

THURSDAY \*WEAF-NEW YORK CITY-492

\*WEAF—NEW YORK CITY—492

11 a, m.—Musical program.

11:10 a, m.—Talks to housewives.

11:50 a, m.—Market and weather report

10 p, m.—Solos and duets, Anna Gretch

11:50 a, m.—Market and housewise.

12 p. m.—Waldorf-Astoria dinner music.

13 p. m.—Mid-week services.

13 p. m.—Teresa Wolfe Rashkis, pranc.

.—Eleanor Gunn's fashion talk. m.—Dally menu. m.—"The Progress of the World. . m.—Alfrieda Bertin, violinist day. 30 p. m.—Gotham Orchestra.

p. m.—Gotlam Ordestra.

m.—Weekly French lesson.
p. m.—Wanamaker concert.
p. m.—"America's Role in Europe,"
r. Jeremiah W. Jenks.
p. m.—Navy band of Virgin Islands.
0 p. m.—Waldorf-Astoria dance orchestra.
\*\*WJY—NEW YORK CITY—405
"Doutsche Literatur," Profes sor Zinnecker.
""How to Learn to Swim," Fran

tainers.

45 p. m.—Boy's period.
p. m.—Florence Hedges, singing.

15 p. m.—Frank D. Penny, violinist.

30 p. m.—Marcia Schupac, soprano.

45 p. m.—Locetto C. Lynch, "Tea Time Talk." 5 p. m.—Leonard Partridge's orchestra. 6-7 p. m.—Olcott Vail's trio. jests. tal

p. m.-Abner Silver, Sam Kov

singing. singing. 11:30 p. m.—Original James Boys \*WAAM—NEWARK—263 \*WAAM—NEWARK—260 7:30 p. m.—James Moore's entertainers. 8 p. m.—Walter Storey, "Motion Pictures 8:15 p. m.—Mile. A. van den Brandel-operatic selections. 8:45 p. m.—Harry Knox's entertainers. m.—Catello's Radio entertainers
\*WBS-NEWARK-360 :30 p. m.—Jimmy Sherare, singing p. m.—Bessie and Katherine Bush

8 p. m.—Bessie and Katherine Bush.
8:15 p. m.—Dorothy Tompkins, planist.
8:30 p. m.—Florence Deebner, Philip Miller and Elmer Wentzel.
8:45 p. m.—Tuxedo Dance Orchestra.
\*WOR—NEWARK—405
3:15 p. m.—Clarre Tree Major, "The Threshold Players."
3:30 p. m.—Jerry Drew's Columbia Park Orchestra.
6:15 p. m.—Albert E. Sonn, "Radio for the Layman."

B. Fischer's
Charles Fry's
Palisades Park
Charles Gates's
B. Fischer's
Candelori's
Harold Stern's
Roseland
Vincent Lopez
Pete Maclas's
Candelori's
AUGUST 2
Ton Banks's

Tom Banks's
Bob Fridkin's
Ky. Serenaders
Ernie Krickett's
Westminster
Paul Specht's
Waldorf-Astoria

Waldorf-Astor State Ballroom Jack Fox's Westminster Vincent Lopez Bob Leman's Copley Plaza J. A. Chickene'

\*\*WMAF—S. DARIMOUTH—S63

p. m.—Teresa Rashkis, soprano.

145 p. m.—George Vause, pianist.
p. m.—WEAF Country Club Group.

130 p. m.—Teresa Rashkis, soprano.

145 p. m.—George Vause, pianist.

\*\*WGI—MEDFORD, MASS.—360

p. m.—Market reports.

115 p. m.—Code practice lessons.

115 p. m.—Musicale.

\*KDKA—PITTSBURGH—326 \*\*KDRA—FIA SECULATION 12:15 p. m.—Scalzo's Orchestra.
3:15 p. m.—Scores, inning by inning.
6:30 p. m.—Dinner concert.
7 p. m.—Scores, dinner concert.
7:30 p. m.—The children's period.
8 p. m.—Scores; talk.

8 p. m.—Scores; taik. 8:15 p. m.—Farm program. 9 p. m.—KDKA Little Symphony Orche p. m.—Concert. \*WCAE—PITTSBURGH—462 7:45 p. m.—Baseball scores.
9:30 p. m.—Musical program.
11 p. m.—Moores' Radio Review.
\*KQV—PITTSBURGH—270

\*WFI—PHILADELPHIA—395

\*WIP—PHILADELPHIA—509

\*WIP—PHILADELPHIA—509
.m.—Seashore gossip.
.m.—''What Wild Waves Say."
p. m.—Radio Baby Clinic.
p. m.—Visiting artists' chats.
p. m.—Concert, Comfort's Orchestr
p. m.—Dinner music.
m.—Bedtinue stories.
m.—Talks to motorists.
p. m.—Concert, Comfort's Orchestr
p. m.—Murphy's Minstrels.
p. m.—Vessella's Concert Band.
ib. m.—Dance music. Harvey Ma

\*WDAR-PHILADELPHIA-395

rchestra.
0 3 p. m.—Concert Orchestra.
0 p. m.—Dance music.
1 m.—Question period.
5 p. m.—Baseball scores.
\*WGY—SCHENECTADY—380

ion Army Band. \*WGR-BUFFALO, N. Y.—319

2:30 p. m.—Organ recital. :30 p. m.—Vincent Lopez's Dance Orche

p. m.—Music and talk.
30 p. m.—Organ recital.
p. m.—Concert by Schenectady

:30 p. m.—News; scores. \*WNAC—BOSTON—278

p. m.—Shepard Colonial Orchestra.

p. m.—Anniversary artists' program. \*WDBH—WORCESTER, MASS.—268

. m.—Musical selections. \*WBZ—SPRINGFIELD, MASS.—337

7 p. m.—Baseball results.
7:30 p. m.—Bedtime story.
9 p. m.—Robert Ridge, planist.
9:30 p. m.—Col. John A. Pattee, playe of dances and songs.
\*WMAF—S. DARTMOUTH—363

:15 p. m.—Dance

:30 p. m.—Music; sunset stories. WRC—WASHINGTON—469 p. m.—Dance pro-L'Aiglon Orchestra. WCAP—WASHINGTON—469

i-10:30 p. m.—Music by
Dance Orchestra.
WHAS—LOUISVILLE, KY.—400
5 p. m.—Dick Quinlan's Orchestra.
8:30-10 p. m.—Concert.
WMC—MEMPHIS—500
—Program by H. B. Woote m.—Program by H. B. Wooten.
WLW—CINCINNATI—423
n.—U. S. Civil Service talk.
p. m.—Instrumental trio.

0:50 p. m.—Quartet.
1 p. m.—Doherty's Melody Boys.
WSAI—CINCINNATI—309
0 p. m.—Solos by Miss Lydia Mayer,
ward Olds, Miss Edna Innes and R
Fergus.
WMAX—CLEVELAND—390

p. m.—Franasci's over vocal selections.

WWJ—DETROIT—517 WWJ-DETROIT-517

:30 p. m.—Schmeman's Concert Band.
:30 p. m.—Orchestra selections.
WCX--DETROIT-517

p. m.—Dinner concert. m.—Organ recital. WHB-KANSAS CITY-411

1:30 p. m.—Popular dance program
WDAF—KANSAS CITY—411 p. m.—Piano selections; address; children's story; orchestra selections.
WLAG—ST. PAUL—MINNEAPOLIS—41 30 p. m.—Farm lectures. WHO—DES MOINES, IOWA—525

midnight—Musical program.
WOC—DAVENPORT—484 p. m.—Sport news.

p. m.—Orchestra program (one hour)

KYW—CHICAGO—536 :45 p. m.—Children's bedtime story.
p. m.—Dinner concert by Joska Debary's and Paul Whiteman's "Co

gians."
p. m.—"Good Reading."
:20 to 9:15 p. m.—Musical program.
0 to 11:30 p. m.—"At Home Program."
WEBH—CHICAGO—370 7:30 p. m.—Violin and dance selections.
11:30 p. m.—Songs and dance selections.
11:30 p. m.—Songs and dance selections.

WMAQ—CHICAGO—448
6:30 p. m.—LaSalle Orchestra.
9:15 p. m.—To be announced:
WLS—CHICAGO—345
5:30 to 9:15 p. m.—Music, lullab
Music Publishers Night.
WDAP—CHICAGO—360 p. m.—Dinner concert, Drake. p. m.—Organ recital; quartet. WOAW—OMAHA—526 7:30 p. m.—Yost's Orchestra. WFAA—DALLAS—476

WRC—WASHINGTUN—108
8:15 p. m.—Song recital.
8:30 p. m.—A talk on the army.
8:45 p. m.—Song recital.
9 p. m.—A talk on the navy.
9:15 p. m.—Elizabeth Dayton, :30 p. m.—Robert Pool, tenor. 2 midnight—Mustang Serenaders KGO—OAKLAND—312 -8:30 p. m.—Concert orchestra. Divide"; music.

KPO—SAN FRANCISCO—423

KPO—SAN FRANCISCO—423 p. m.—Rudy Seiger's Orchestra. m.—Max Bradfield's Band. KGW—PORTLAND, ORE.—492

p. m.—Concert. a. m.—Dance music. KHJ—LOS ANGELES—395 p. m.—Al Schiller, pianist; Hs

FRIDAY \*WEAF-NEW YORK CITY-492 a. m.—Musical program.
:10 a. m.—"Building a Home," by Roger Whitman.-11:30 a. m.—Health talk. 11:50 a. m.—Market and weather repor 4 p. m.—Dorothy Jung, soprano. 4:16 p. m.—Harry Olson, banjo player.

4:30 p. m.—Dorothy Jung. soprano. 4:45 p. m.—Harry Olson, banjo player. 6 p. m.—Waldorf-Astoria dinner music. 7:30 p. m.—Children's stories by Blanch wade. 7:45 p. m.—Elizabeth Topping, pianist. 8 p. m.—Moses Levine, violinist. 8:15 p. m.—Joseph C. Wolff, bass bary tone.

tone.

tone.

m.—Elizabeth Topping, pianist.

topping, pianist.

m.—Moses Levine, violinist.

m.—Cance Orchestra selections.

m.—"Cold Rice Dishes for Ho
Days," Elizabeth Hallem Bohn. 1:40 p. m.—Dance Orchestra. \*WJZ—NEW YORK CITY—455

1 p. m.—Trio.
4 p. m.—Eleanor Gunn's fashion talk.
4:10 p. m.—Daily menu.
4:30 p. m.—Organ recital.
5:30 p. m.—Market reports.
7 p. m.—Ernie Golden's Orchestra.

7:20 p. m.—Financial developments. 7:30 p. m.—Ernie Golden's Orchestra 8:15 p. m.—"Humor," Tom Masson. 8:30 p. m.—New York Philharmoni

10:15 p. m.—Pop question game. 10:30 p. m.—Harold Stern's Orchestra. \*WJY—NEW YORK CITY—405 7:30 p. m.—Leonard Nelson's Orchestra. 8:15 p. m.—"The Supreme Court and Con stitutional Government," Professor Swer

\*WHN-NEW YORK CITY-360 10-11 à. m.—'Woman's Hour." 2:15 p. m.—Gene Austin, barytone. 2:30 p. m.—Judith Roth; Al. V singing.
2:45 p. m.—Joseph C. Wolfe, barytone.
3 p. m.—Wright and Bessinger. harmo

3 p. m.—Wright and Bessinger. harmony. singers.
3:45 p. m.—Chat with children.
4 p. m.—Samuel Shankman, pianist.
4:15 p. m.—Vocal duets; Hermina West, soprano; Bertha Rodgers, contralto.
4:30 p. m.—Jascha Bunchuk, cellist.
4:45 p. nı.—Musical program.
6-7 p. m.—Olcott Vail's Trio; jests, talk, songs; Paul Specht's Orchestra.
7 p. m.—Sport period.
9:30 p. m.—Chas. Strickland's Orchestra.
10 p. m.—William B. Malloney, barytone.
10:15 p. m.—Baseball statistics.
10:30 p. m.—Fletcher Henderson's Orchestra.

tra.
1 p. m.—Ross Fowler, barytone.
1:30 p. m.—Club Alabam Revue. \*WOR—NEWARK—405 2:30 p. m.—Herman Gelhausen, barytone, 2:45 p. m.—Edith Gray, soprano, 3 p. m.—S. S. George Washington Or

:30 p. m.—News; scores. -11 p. m.—Musical prog

\*WGY-SCHENECTADY-380

:30 p. m.—Radio entertainment. \*WDBH—WORCESTER, MASS.—268

p. m.—Musical selections.
p. m.—Lewis & Morse Dance Orchestr
\*WBZ—SPRINGFIELD, MASS.—337

y. m.—Baseball results.

30 p. m.—Baseball results.

30 p. m.—Bateball results.

10 p. m.—Ethel Woodman, contralto:

11 p. m.—Concert by WBZ Trio.

\*WGI—MEDFORD, MASS.—360

. m.—Musicale. \*WJAR—PROVIDENCE—360

6:30 p. m.—Organ recital.
7:30 p. m.—The children's period.

p. m.—Concert by church quartet
\*WCAE—PITTSBURGH—462

7:30 p. m.—Uncle Kaybee, 9:30 p. m.—Charles Gates' Orchestra \*KQV—PITTSBURGH—270

prano.
9:30 p. m.—Irving Boernstein's Trio.
Data Macias' I. Aiglan Orch

WMC-MEMPHIS-500

m.—Britling's orchestra.
m.—Midnight Frolic.
WLW—CINCINNATI—423

p. m.—Special program,

WWJ—DETROIT—517

Selections.

9:30 p. m.—Orchestra selections.
10 p. m.—Jean Goldkette's orchestra
11 p. m.—Orchestra selections

Vernier, planist. WOC-DAVENPORT-484

WEBH-UHIVAGU-3/9
130 p. m.—Tenor; dance selections.
1:30 p. m.—Songs; dance orchestra.
WMAQ—CHICAGO—448

6:30 p. m.—La Salle orchestra. 8:45 p. m.—To be announced. 9:30 p. m.—Bookfellow's night. WLS—CHICAGO—345

n,-Note's Band concert.
m.-Road bulletin.
WHB-KANSAS CITY-411

WDAF-KANSAS CITY-411

4:30 p. m.—Music; sunset stories. WRC—WASHINGTON—469

\*WHN-NEW YORK CITY-360 :30 p. m.—Herman Gelhausen, barytone. 7 p. m.—Olcott Vail's Trio; jests: talks :45 p. m.—Edith Gray, soprano. :15 p. m.—Agnes Leonard, songs for chilsongs; Paul Specht's Orches:
30 p. in.—Bedtime stories.
45 p m.—Music. dren. .:30 p. m.—"Man in the Moon" stories. p. m.—The Naborhood Trio.
:20 p. m.—Resume of day's sports. \*WFI-PHILADELPHIA-395

1 p. m.—Meyer Davis's Concert Orchestra.
3 p. m.—Ethel Shoemaker, soprano; Harold Simonds, barytone; Caroline Hoffman, pianist.
6:30 p. m.—Meyer Davis's Orchestra.

1.35 p. m.—Bettime stories.

1.36 p. m.—Music.

1.37 p. m.—Jimmy Flynn, tenor.

1.36 p. m.—Jack Fox's Orchestra.

1.37 p. m.—Baseball statistics.

1.38 p. m.—Frank Loforese, barytone.

1.38 p. m.—Fitzpatrick Brothers, old-time melodies.

1.39 p. m.—Jimmy Clarke's Entertainers.

\*WBS—NEWARK—360

1.1 a m.—Piano recital on the Ampico.

1.2:15 p. m.—Fopular dance music.

\*WOR—NEWARK—405

6:15 p. m.—Frine Krickett's orchestrs. \*WBS—NEWARK—360
7:30 p. m.—Theo Alban.
7:40 p. m.—Vivian Gilbert.
7:50 p. m.—Bobette LaMarr.
1 p. m.—Joe Sherman and Margaret \*WOR—NEWARK—405
6:15 p. m.—Ernie Krickett's orchestra.
7:20 p. m.—Resume of day's sports.
8 p. m.—S. S. President Roosevelt orchestra.
8:50 p. m.—Talk by Captain George Frii.
9 p. m.—Edward Anthony. "The Humorous Treatment of Sports."
9:15 p. m.—The Margulies Trio.
9:46 p. m.—Frederick Tedesco, piano accordion. 8:30 p. m.—The Brookwood Trio. 8:45 p. m.—Fred Miller's Radio \*WIP—PHILADELPHIA—509 3:05 p. m.—Concert, Comiort's orchestra, 6:05 p. m.—Eddie Elkins' orchestra.

cordion.
0:30 p. m.—The Margulies Trio.
0:45 p. m.—Frederick Tedesco. piar cordion.
\*WIP—PHILADELPHIA—509 p. m.—Bedtime stories. \*WDAR—PHILADELPHIA—395 \*WDAR—PHILADELPHIA—395
4:30 p. m.—Dance program given.
5:45 p. m.—Baseball scores.
7:30 p. m.—Dream Daddy; features.
8 p. m.—Book review; artist recital.
8:15 p. m.—Dance music.
8:30 p. m.—Emmett Welch minstrels.
9:15 p. m.—Benson Chicago Orchestra.
9:30 p. m.—Charley Fry; orchestra.
10 p. m.—Concert orchestra; Benson cago Orchestra, and Charley Fry; chestra.
WOO—PHILADELPHIA—509
7:30 p. m.—Sports results; police repo p. m.—Bedtime stories.

p. m.—Concert, Comfort's Orchestra

to p. m.—What Wild Waves Say."

to p. m.—Dance music. Bob Leman's Orchestra.

to p. m.—Dance music. Bob Leman's Orchestra. :05 p. m.—Organ recital. \*WGR—BUFFALO, N. Y.—319

\*WGR—BUFFALO, N; Y.—319
12:30 p. m.—Organ recital.
10:30 p. m.—Dance music by Joseph A. Chickene's Orchestra.
\*WMAF—S. DARTMOUTH, MASS.—363
7:45 p. m.—Hyman E. Piston, violinist.
8 p. m.—Instrumental quintet of the S. S.
President Wilson.
8:25 n. m.—Naroy McCord, soprano. dinner music.

8:15 p. m.—Jean Masters, pianist.

8:36 p. m.—Jean Masters, pianist.

1:30 p. m.—WOO Orchestra.

1:30 p. m.—Organ recital.

0 p. m.—Dance program, Candelori's rehestra. chestra.

11:03 p. m.—Dance program.

\*WGR—BUFFALO—319

3:30 p. m.—Vincent Lopez's Dance chestra.

President Wilson. 8:25 p. m.—Nancy McCord. soprano. 8:40 p. m.—Hyman E. Piston, violinis 8:55 p.- m.—Wright and Bessenger. mony singers. 9:15 p. m.—Instrumental quintet; Vittorio Toso, barytone. 9:40 p. m.—Wright and Bessenger, harmony singers. \*WGI-MEDFORD, MASS.--360

SATURDAY

\*WEAF-NEW YORK CITY-492

barytone. 125 p. m.—Nancy McCord, soprano. 135 p. m.—Hyman E. Piston, violir 135 p. m.—Wright and Bessinger,

mony Singers.

9:15 p. m.—Instrumental Quintet; Vittorio
Toso, barytone.

9:40 p. m.—Wright and Bessinger. Harmony Singers.

10-11 p. m.—Vincent Lopez's Orchestra.

\*WJZ-NEW YORG CITY-455

n.—Hotel Orchestra. . m.—Roger Wolfe's Orchestra . m.—Market reports.

p. m.—Vincent De Sola, piànisi.

30 p. m.—'Making Radio Beautifut.

Alfred N. Goldsmith.

45 p. m.—Alexis Kudisch Ensemble.

0:45 p. m.—Dance Orchestra.

\*WGY—SCHENECTADY—380
6:30 p. m.—Children's story,
8:50 p. m.—Radio drama, "Scrap of Paper,
by WGY Student Players,
11:30 p. m.—"Claude Debussy's Music."
12:05 a. m.—Organ recital,
\*WRW—TARRYTOWN, N. Y.—273 :15 p. m.—Code practice lesson. :30 p. m.—Talk; musicale; weather re \*WNAC-BOSTON-278 8:15 p. m.—Dance music.
9:15 p. m.—Dance music.
10:15 p. m.—Dance music:
10:15 p. m.—Dance music: popular songs.
\*WDBH—WORCESTER, MASS.—268 9 p. m.—Police reports; music; scores; 9:30 p. m.—Jimmy Moore, tenor, 9:45 p. m.—"Radio." Frederick Koenig. 10 p. m.—WRW Entertainers; Jimr p. m.—Musical selections. \*WBZ—SPRINGFIELD, MASS.—337

p. m.—Baseball results. 30 p. m.—Bedtime story. 10 p. m.—WRW Entertainers, Moore.

Moore.

\*WMAF—S. DARTMOUTH—562

7:30 to 9 p. m.—Joseph C. Wolff, bass-barytone; Elizabeth Topping. pianist;

Moses Levine, violinist.

9 to 10 p. m.—Orchestral selections.

\*WNAC—BOSTON—278

6:30 p. m.—WNAC dinner dance.

8 p. m.—To be announced.

11:30 p. m.—Radio entertainment. m.—Concert. —Mark Mohler, barytone. :30 p. m.—Mary Brady Stone, soprance \*WJAR—PROVIDENCE—360 \*WJAR—PROVIDENCE—360
7:05 p. m.—Scores; musical program
\*KDKA—PITTSBURGH—326
7:15 p. m.—Score; dinner concert.
7:30 p. m.—The chidren's period.
7:45 p. m.—Helps to teachers of

7:45 p. m.—Heips to teachers of classes.
8 p. m.—Baseball scores.
9 p. m.—Concert. Westinghouse band.
\*WCAE—PITTSBURGH—462
7:30 p. m.—Uncle Kaybee.
7:45 p. m.—Baseball scores; vocal

tions
9:30 p. m.—Musical program
9:30 p. m.—Musical program
9:30 p. m.—Basseball scores.
9:45 p. m.—Basseball scores.
9:50 p. m.—Bible talk.
9:50 p. m.—Song recital, by Prestons Haynes.
9 p. m.—Army Music School Band.
WSAI—CINCINNATI—309 8 p. m.—Chime concert.
9 p. m.—News review; musical program.
12 midnight—Royal Garden Orchestra.
WHAS—LOUISVILLE, KY.—400 8:30 to 10 p. m.—Concert by F. A.
WMC—MEMPHIS—500

WMC—MEMPHIS—500

9:30 p. m.—St John's Male Quartette.
WJAX—CLEVELAND—390

12 midnight—Nite Caps' Quartet; orch
tra selections.
WWJ—DETROIT—517

8:30 p. m.—Schmeman's Concert Bane
9:30 p. m.—Orchestra Selections.
WCX—DETROIT—517

4:15 p. m.—Music; baseball scores
6 p. m.—Dinner concert.
WOC—DAVENPORT—484

10 p. m.—Orchestra program (one book

p. m.—Pete Maclas' L'Aiglon Orchestra.
WHAS—LOUISVILLE, KY.—400
to 10 p. m.—Concert by Mary G. 0 p. m.—Orchestra program (one h. WDAF—KANSAS CITY—411 and music.

KYW-CHICAGO-536 6:45 p. m.—Children's bedtime story.
7 p. m.—Dinner concert; Joska DeBabary and Paul Whiteman's "Collegians." and Paul whiteman's "Collegian's p. m.—Musical program.

p. m.—Talk by Vivette Gorman.

p. 05 p. m.—Short stories; ht sketches.

WEBH—CHICAGO—370

11 p. m.—Orchestra selections.

WCX—DETROIT—517
8:30 p. m.—Arthur Keucken, violinist; Miss
Irma Seitz, accompanist; Mrs. Thomas
D. Watkins, soprano; Miss Margaret
Vernier, planist. 1:30 p. m.—Songs; story; dance orchestr 1:30 p. m.—Guitar duets, tenor, dance of chestra.
WMAQ—CHICAGO—448

6:45-12 p. m.—Lullaby .... dance; music. WDAP—CHICAGO—360 WDAP—CHICAGO—360 strels.

2:45 a. m.—Nighthawk Frolic.

KYW—CHICAGO—536
p. m.—Dinner concert by broadcast from the Congress Hotel; Joska de Babary's and Paul Whiteman's "Collegians."

20 p. m.—Talks.
p. m. to 12:30 a. m.—Midnight revue.

WEBH—CHICAGO—370

30 p. m.—Tenor: darge selections p. m.—Jack Chapman's Orchestra.

KGO—OAKLAND—312

p. m.—Arion Trio; male quartet.

to 4 p. m.—Henry Halstead's Dance Chestra.

KPO—SAN FRANCISCO—423 m. to 4 a. m.—Art Weidner's Or chestra.

KGW-PORTLAND, ORE.-492 a. m.—Reports; mores; weather; by George Olsen's Orchestra. KHJ—LOS ANGELES—395 KHJ—LOS ANGELES—395

a. m.—Art Hickman's Orchestra.
KFI—LOS ANGELES—469

11 p. m.—Los Feliz Trio.

a. m.—Popular song program.

2 a. m.—Cocoanut Grove Orchestra.

\*\*OKAC—MONTREAL—425

7 p. m.—Kiddies' stories.

7:30 p. m.—Rex Battle's orchestra.

8:30 p. m.—"La Presse" specials.

10:30 p. m.—Joseph C. Smith's orchestra.

i:30 to 10 p. m.—Music; Lullaby farm talks.

WDAP—CHICAGO—360 11 p. m.—Jack Chapman's Orchestra. RFKX—HASTINGS, NEB.—280

**World Radio History** 

Dance Orchestras for This Week

Daylight Saving Time

WTAM, Cleveland, on August

Concert From WTAM

#### Why Your Receiver Squeals

#### Explanation of the Chirps and Whistles Often Heard in Broadcast Receivers

#### By JOHN V. L. HOGAN

cast receivers. One kind is caused cillating and hence non-interfering cert will be billed as "All-Lorain when two broadcasting stations send sets. simultaneously at wave frequencies Nearly, if not absolutely, all of the (wave lengths) that are too close to- interference-producing receivers are gether. Their waves react on each of the simple regenerative type, other and produce a more or less though more complicated outfits such nearly wiped out by a tornado on uniform whistling note, often of as the super-heterodyne, when used June 28. WTAM at that time was very high pitch, in all the radio re- with an antenna, will cause this trou- instrumental in rushing aid to the ceivers within range. This sort of ble. They may be of single-circuit, stricken city when all other means of interference is not very bothersome, double-circuit, triple-circuit, or of communication in and out of the except occasionally when listening any other design, or they may be of city were wrecked. to 833-kilocycle (360-meter) waves. unneutralized radio-frequency ampli- First information to the world of It is daily growing of less import- fier or reflex layout; many of these the plight of Lorain was made public ance, and for the moment we need will generate oscillations in the an- through radio amateurs sending word not consider it further, although it tenna circuit and produce interfer- from the city and co-operating with will be discussed in a future article ence if not specifically designed WTAM in asking help.

The second kind of whistling inceivers, or, in other words, by re- this whistling interference produced whom were rendered homeless by the terference is caused by radiating receiving stations that are so designed by oscillating receivers. The first ternado, are coming to WTAM to and so operated that they act as and simplest way is simply to tune entertain radio listeners. small radio transmitters. This kind and manipulate your own receiver of interference is now exceedingly properly, and to teach your radio of these people to stand in front of troublesome and breaks up a great friends to do the same with theirs. the same microphone that told of the deal of broadcast reception. It is a A little work among your nearby loss of their loved ones and sumparticularly severe nuisance in lo- radio listeners will produce wonder- moned aid to the homeless and sing. calities where many radio receivers ful results in this way, for no one But the spirit of devastated Lorain are set up close together, as in the wants to trouble his friends and ordi- will be exemplified by them when cities; but even in the country this narily a neighborhood can be cleaned they do just that. squealing and whistling interference up of the strongest receiver-produced often completely prevents satisfac- whistles quite easily. The second and more difficult method is to arrange your receiver so that it cannot

It is safe to say that nearly every the chirp or whistle of rapidly varying pitch that is the mark of this kind of interference. Many listeners, however, do not know what causes the troublesome whistles and many do not know that their own receivers may be adding nightly to the general din of squawks and squeals.

#### Chirps and Whistles

The reason why these chirps and There is one simple rule that answers cells with the highly efficient UV-201to many radio listeners, although wave length or tuning control knob not at all complicated. It is merely telephone or loud speaker, and if also what many radio engineers have another manifestation of the com- you can change the pitch of that note stated was extremely difficult, if not mon phenomenon of "beats" that is by turning the tuning knob, you are impossible. It is stated that only frequently noted in acoustics. You making interference for all the lis- five milliamperes of plate current is musical tones of neighboring pitch receiver is one of the latest designs the "B" batteries. are sounded simultaneously, the that keep the oscillations out of the combined tone flutters in intensity. antenna circuit. Whistles whose This happens because the two sound pitch you cannot control do not come waves interact or "beat" together, from your set, and you need not co-operation of a magazine, have and the rapidity of the flutter is blame yourself for causing them. lately inaugurated a new and interalways equal to the difference in On the other hand, if you have no esting feature for their programs. frequency of the two sounds. Thus, blocking tube in your set, whenever These stations have recently broadif two organ pipes of 32 and 36 vi- you hear a whistle and find that you cast several very gripping detective brations per second, respectively, are can vary its pitch by moving your and mystery stories. This is a new blown at the same time, the sound tuning control, you may be sure that departure and both the broadcasting heard will grow strong and weak (or all your neighbors who are listening stations and "Mystery Magazine." flutter in strength) four times per to the same station are hearing the through whose courtesy these stories

In the same way, if two radio spoiling your own reception but also supplying the radio public with this waves or two radio-frequency cur- theirs. rents of somewhat different fre- Unless you use a blocking tube the magazine will continue to furnish quencies are allowed to interact upon wise and considerate thing to do is WJZ and WJY with original manueach other they will produce beats. to keep your receiver adjusted so that scripts by well known writers. The Thus a carrier wave from station it is not in the oscillating condition stories are short, crisp and interest-WEAF, at the frequency of 610,000 that produces interference. When ing and are well worth continuing. second might interact with the carrier wave from another stop your set from oscillating. If transmitter at 611,000 cycles per you will follow that rule and will imsecond to produce 1,000 beats per press its importance upon your radio second. When picked up and recti- friends you will find that great reducfied, such beating waves would pro- tions in the amount of whistling induce, in the listening telephones or terference can be made. loud speaker, a note of 1,000 per second pitch, corresponding approximately to the second C above middle C on the musical scale. Any change in frequency of either beating wave would produce a change in the pitch of the beat note, since this must always equal the difference in the two wave frequencies.

In the same way a carrier wave from any station will beat with waves or currents produced by any self-oscillating receiving set. The frequency of the oscillations in the receiver, and of the waves that those oscillations will send out if they are allowed to get into the receiving antenna, depends upon the tuning adjustments of the receiving set. As the tubing knobs are turned the frequency changes. Consequently the pitch of the beat-note produced also changes, and this is what gives rise to the bird-like chirps and whistles that are so often heard.

#### Interfering Receivers

If you have a radio receiver of any of the types that can be made t cause oscillations in the antenna cir cuit, your set is one that may interfere with your radio neighbor's reexption. The receiving sets that can be made to generate antenna-circuit oscillations, and thus to interfere

How to Detect Interference

RADIOLA SALE

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might well be entitled "After the Storm," taking the name from that popular composition. This, in spite ENERALLY speaking, there with receiving throughout the neighborhood, are probably made and used The artists for the night are all interference heard in broad- in larger numbers than the non-os- Lorain, Ohio, people and the con-

> Radio listeners will remember Lorain as the Ohio city that was

otherwise, particularly when they are Now, after the storm, a group of not correctly handled by the user. Lorain people, some of whom lost There are only two ways to stop relatives or friends and some of

#### New Receiver Announced

equally a mystery that question: If, when turning your A and C-301-A tubes is possible

Mystery Stories at WJZ

Stations WJZ and WJY, with the



"Electrovox," meaning electric tenna you prevent the radiation of

broadcast listener has often heard the chirp or whistle of rapidly varyreach the antenna. By preventing the manufactured by the American Spegeneration of oscillations in your an-This is a five-tube tuned radio-frequency receiver incorporating many features, both electrical and mechanical, that are claimed to be new in Many of you are perhaps now won- radio. The tubes require only three dering how you can tell whether or volts filament potential, prolonging not your own receiver is ever a their life. Low "A" battery consumpsource of neighborhood interference. tion is claimed and the use of dry

same whistle. Thus you are not only are furnished, are to be thanked for



blasting. It is sold at a strictly wholesale price. Do not be misled by the unscrupulous real! dealer trying to sell you Goldentone Amplifiers, as we only sell direct

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All parts are carefully constructed in our factory of the best materia tainable, and are individually guaranteed. NEUTRO coils have silk etwire wound on genuine BAKELITE. No shellac or varnish, which introduce losses. EVERY part that is needed to BULD this A & P. NEUTRODYNE is meluded in this KIT at the REMARKABLY LOW PRICE of

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money in business. One is to sell a few articles at a high price and a large profit on each article. The other way is to sell a great many articles at a small profit on each. This is the way of Wathal.

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#### -SPECIAL CONTEST-

complete, any standard make, with tubes, batteries, loop and loud speaker, ready to operate, will be offered by the Commonwealth Radio Club of America for the best and simplest description of "How to Construct, Hook Up and Equip, with everything ready for operation, a Five Tube Standard Set."

# THE NEW YORK HERALD New York & Earthune

SECTION NINE

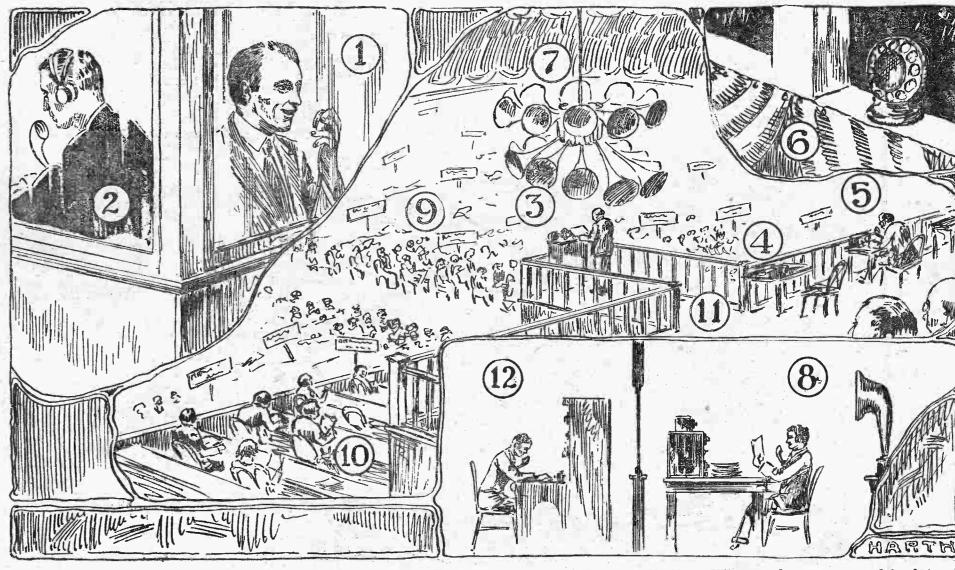
SUNDAY, AUGUST 3, 1924

16 PAGES

## Connecting Radio Broadcasting Stations By Land Telephone Lines Is a Big Job

Many Engineering, Technical and Practical Problems Must Be Solved to Enable Broadcast Listeners to Receive Important Speeches and Accounts of Interesting Events

By AMARANTH JOLLIFFE



the first time radio will be used | following. to influence the voters of the country. The principal candidates of the Republican and Democratic parties as well as nationally known orators and numerous spellbinders not so well known will face the microphone and send out on the air their party policies, performances and

It seems likely that a new type of orator will be developed during the campaign about to open. The old-fashioned, flag-waving, arm-slinging, belligerent, perspiring stump speaker will find, if he is permitted to try, that his former arts and wiles have no effect on the inanimate "mike" which can transmit nothing but his voice and his gasps for breath. The new orator will limit his speech to not more than fifteen or twenty minutes, as a rule, and he must have something interesting or worth while to say. Also he must say it clearly, distinctly and back it up with all the personality of which he

may be possessed. Neophytes at the broadcasting game will do well to consult with experienced station managers and announcers before undertaking a radio speaking tour. These men can tell in advance whether a speech will "get over" with the radio audience.

ment has entered politics. For of transmission. Their advice is worth

The managers of both the Republican and Democratic parties already have announced that broadcasting campaign speeches by radio will form an important part of their efforts to impress the voters of the country. Therefore, it becomes of interest to learn what we can of how this

Where it is designed to reach a comparatively local audience, say within a radius of a hundred miles, the facilities of the most favorably located broadcasting station will be utilized. If it is desired to reach a large section of the country at the same instant, it will be necessary to connect as many broadcasting stations as possible by land telephone lines. In some instances telegraph lines have been used to connect two stations.

The first attempt to transmit the proceedings of a political convention was that made at Cleveland recently when the sessions of the Republican National Convention were broadcast to a large part of the United States by about twenty stations. These were connected with the microphone in the convention hall by land telephone lines of the American Telephone and Telegraph Company. The result was eminently successful. Later, at After hearing a speaker's voice they can the Democratic National Convention in

the effort was repeated with even more satisfactory results.

The average broadcast listener has no conception of the intricate details involved in temporarily adapting commercial telephone lines to the purpose of connecting broadcasting stations with a common source of transmission. Taking as an example the Democratic convention in New York, an attempt will be made to throw a little light on this interesting, down-to-the-minute development of com-

The following broadcasting stations vere connected with Madison Square Garden during the recent Democratic convention: WEAF, New York; WGR, Buffalo; WCAP, Washington; WRC, Washington; WNAC, Boston; WTAT, Boston; WJAR, Providence; KDKA, Pittsburgh; WTAM, Cleveland; WJAX, Cleveland; WLW, Cincinnati; WGN, Chicago; WLS, Chicago; WMAQ, Chicago; KSD, St. Louis; WDAF, Kansas City, Mo.; WDBH, Worcester, Mass.; WSB. Atlanta, Ga.

The numbered sketch herewith picturizes the details of the installation at Madison Square Garden. The figures and their references are as follows:

1. Announcer in glass inclosed soundproof booth, with microphone before him.

NEW and vitally important ele- | tell him all about its quality for purposes | Madison Square Garden, New York City, | He is in complete charge of broadcasting details.

2. Announcer's assistant, wearing headphones and breast transmitter, connecting him with "order wire system," which enables immediate communication with all the elements of the broadcasting and wire system.

3. Microphones for speakers, serving radio input and public address system. Arrangement of chairs and railings assures that speaker will remain at the proper distance from the microphone.

4. Chairman's seat.

5. Radio observer's seat, connecting with order wire system. In this advantageous situation, he can give complete information as to the proceedings and keep the announcer and broadcasting stations thoroughly informed as to details. 6. Microphone in balcony to pick up the

orchestra, as directed by announcer.

7. Loud speakers of public address

8. Input operator, controlling input amplifier supplying wire telephone lines. Loud speaker gives him reproduction of what is furnished the wires. Breast telephone and transmitter keep operator in touch with announcer, observer and broadcasting stations located in basement under delegates.

Continued on page three

English amateur sets, and is operated with more than customary power of

ten watts through a special permit

Hartley. During the trans-Atlantic

### How to Build a Radio Frequency Amplitier for the "Super-Heteroflex"

By Means of a Switch the Circuit Can Be Changed From a Four-Tube Set to a Super-Heterodyne

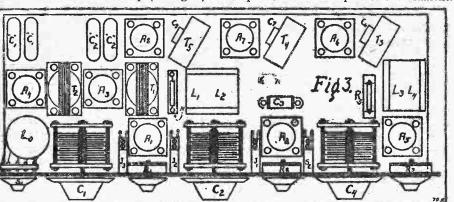
By J. E. ANDERSON

SOUNT HAT kind of receiver is this, a super-heteroflex?" inquired a certain radio addict who was still struggling with radio nomenclature. He had reference to the receiver which is the subject of this article, and which is depicted in the three accompanying illustrations

"Well." replied the writer, "that depends on the position of this double pole, double throw jack switch. Now, it is an eight-tube super-heterodyne; but now it is only a four-tube receiver, comprising one neutralized muffler stage, a detector and two stages of audio-frequency amplification." The switch in question is that one represented by S-2 in Figs. 1, 2 and 3. | leak used to maintain the grid at a nega-

which consists of 45 turns of No. 24 double cotton-covered wire wound on the sam tube as L-3. The two windings should be separated by a distance of about onefourth inch. L-4 should have a tap at the middle turn, to which the positive base bar from the plate battery is connected. The tuning condensers C-4 connected across coil L-4 should have a maximum capacity of .0005 microfarad, and it should preferably be provided with a geared vernier for fine adjustment.

voltage from reaching the grid of the oscillator; and R-5 is a 12,000-ohm grid When this switch is thrown up (in Fig. 1) tive potential with respect to the filament.



the output of the detector tube A-2 passes through the primary of the intermediate frequency transformer T-3, and thus into the intermediate frequency amplifier and to the second detector A-8. The switch also causes the output of this detector to pass into the primary of the audio-frequency transformer T-1, and thus into the audio-frequency amplifiers A-3 and A-4.

But, on the other hand, when the switch is thrown down (in Fig. 1) the output of the first detector A-2 passes directly into the audio-frequency amplifier, and the upper tier of four tubes is thrown out of the circuit. Hence when the switch is up the circuit is an eight-tube super-heterodyne, but when it is down the circuit is an ordinary four-tube receiver.

When the super-heterodyne feature is not in use the filaments of oscillator tube A-5, the two intermediate frequency amplifiers A-6 and A-7, and of the secord detector A-8 should be extinguished.

The input to the first, or muffler, tube A-1 is obtained directly from the antenna inductance coil L-0. This coil should consist of about 150 turns of No. 24 double cotton-covered wire wound on a 2.5 inch composition tube. It should be tapped at the 40th, 80th, 120th and 150th turns, and these taps should be connected to the switch points of an inductance switch S-1. The antenna circuit is tuned by means of this switch and by means of the primary condenser C-1.

#### Transformer Data

L-1 is a winding consisting of twelve turns of No. 24 double cotton-covered wire wound on a composition tube three inches in diameter. L-2 is a winding consisting of 45 turns of the same kind of wire on the same piece of tubing and wound in the same direction. A tap is brought out from this coil at the twelfth turn measured from the end nearest I-1 In connecting these coils the first terminal of L-1 should be connected to the plate of A-1 and the second, or inside terminal, to the positive of the plate battery; the inside terminal of L-2 should be connected to the negative of "C-1" and the outside terminal to one side of the coil L-3. The tap on L-2 should be connected to one | mediate frequency on account of possible side of the neutralizing condenser N. The other side of that condenser is connected to the grid of the first tube. The capacity of the tuning condenser C-2 across the and the self inductance of the secondaries. secondary L-2 should be .0005 microfarad. This will be evidenced by poor selectivity

L-3 is a small coupling coil, by means of which the high frequency oscillations generated in tube A-5 are impressed in the first detector A-2. It consists of eight turns of No. 24 double cotton-covered wire wound on an insulation tube three inches in diameter. L-4 is the oscillating coil, with them and varying these until the

C-5 is a .001 microfarad mica blocking condenser which prevents the high plate

T-3, T-4 and T-5 are intermediate fre-

densers C-6, C-7 and C-8 connected across

the secondaries of these transformers are

high grade mica dielectric condensers

having a capacity of .0001 microfarad.

These condensers taken with the sec-

This makes the overall diameter of the

spools 2% inches. The thickness of the

spool heads should not be less than 3-16

inch, so that the total length of the

spool will be 1% inches. Two binding

nosts should be fastened to each end of

the spools, and soldering lugs should be

placed under them so that the coil termi-

sist of 220 turns of No. 36 double cotton

covered wire wound in even turns and

even layers. On top of the primary

should be a layer of thin paraffined paper

to insulate this winding from the sec-

ondary. The secondaries should each con-

sist of 1,100 turns of the same kind of

wire and wound as evenly as possible.

When the terminals have been soldered to

the binding posts put another layer of

paraffined paper over the winding, and,

over this, a layer of bookbinders' cloth or

other protective covering. The conden-

sers are then connected across the sec-

It may be that the three transformers

will not be in tune with the same inter-

variations in the values of the tuning con-

densers C-6, C-7 and C-8 and variations

in the distributed capacities of the coils

when tuning with condenser C-4 and by

lack of volume in the output of the sec-

It may be remedied by changing the

secondary condensers or by connecting

small variable condensers in parallel

ondary terminals.

The primary windings should each con-

nals may be soldered to the posts.

lects the intermediate frequency.

quency amplifier, and J-3 is a single circuit jack in the output of the final stage. "A," "B" and "C" Batteries There are two grid biasing batteries employed in the circuit, C-1 and C-2. Nine volts negative bias is used on the grids of the two detectors and on the grids of

the two audio frequency amplifiers. On the grids of the remaining tubes, save A-5, a negative bias of 4.5 volts is used. The plate voltage on the two audio frequency transformers adjusted to a frequency amplifiers is 120 volts and that quency of about 50 kilocycles. The con-

circuit of the first and second detectors,

Tubes Used

For the best results UV-201A, C-301A,

or similar tubes should be used through-

out, except that 216A tubes may be used

in the audio frequency stages to good ad-

vantage. Smaller tubes may be used with

J-1 is a double circuit jack which is

used as a common listening post for both

detectors. When the switch S-2 is up the

telephone is in the output of the second

detector; when down, it is in the output

of the first detector. J-2 is a similar

jack in the output of the first audio fre-

be twice that capacity.

fair results in all positions.

tuning is sharp and the volume large. that stray coupling may be minimized.

Condensers C-3 and C-9 are by-pass | C-1, the antenna tuning condenser, is

Condenser C-2 is mounted at the middle

placed in a horizontal position at right

The oscillator is placed at the extreme

right hand end of the cabinet, and the

oscillating coil L-4 is so mounted that its

axis is at right angles to both L-0 and

L-2. The blocking condenser C-5 is not

shown in Fig. 3, but it may be connected

between the stationary plates of con-

denser C-4 and the nearest end of re-

sistance R-5. The common point between

C-5 and R-5 is then connected to the grid

The position of condenser C-9 is not

indicated in the drawing. It should be

connected between the plate terminal of

tube A-8 and the negative filament ter-

minal of that tube by the shortest leads

possible. The locations of all the other

parts are indicated by symbols corre-

sponding to the same symbols on Fig. 1

Fig. 2 shows the panel arrangement of

the set, based on a panel 7x26. Four-

inch dials are used for the three tuning

condensers, because this not only im-

proves the appearance of the set but it

A shield should be used back of the

panel and another between the oscillator

and the remaining portion of the set in

order to reduce body capacity effects and

undesirable coupling between the oscil-

lator and the tuner. Neither of these

shields are shown on the drawing. They

should preferably be made of 1-16-inch

terminal of the oscillator tube.

and Fig. 2.

facilitates tuning.

angles to the panel.

condensers in the plate circuits of the first | mounted directly to the right of this coil.

respectively. The first may have a value of the panel, and the coils L-1 and L-2

of .001 microfarad, while the second should | directly behind C-2. The axis of L-2 is

on the other tubes 60 volts. The negative bias method of detection is used on both detectors because it is more stable in operation and of about equal sensitivity. The required negative bias on the grids when 60 volts plate potential is used is about 9 volts.

ondaries form the filter system which se-In regard to the arrangement of the The three transformers may be made as various pieces of apparatus in this refollows The cores may be made of parafceiver, three methods may be used. A fin treated hardwood. The inside diamvery long panel may be employed so that eter of the spools should be 2 inches. the super-heterodyne portion of the cirand the dimensions of the winding space cuit may be placed to the right of the

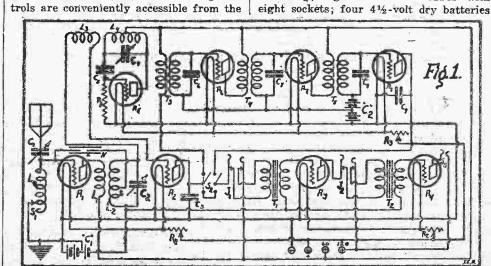
> ordinary tuner and the audio frequency amplifier This, however, is not very convenient. Another method is to build the receiver in two tiers, with the four superheterodyne tubes, the intermediate fre-

This has certain advantages, but the lower tier is not conveniently accessible. The third method is to build the receiver in two rows, one back of the other, as is shown in Fig. 3. Here all the tuning con-

quency transformers and the high frequency oscillator coil and condenser placed above the other portion of the

copper or brass sheet. Equipment Needed Parts required for the construction of the set: C-1, one 43-plate variable air condenser (or 23-plate); C-2, C-4, two variable air condensers, 23-plate; C-3, C-5, two fixed mica condensers, .001 microfarad; C-6, C-7, C-8, three fixed

mica condensers, .0001 microfarad; C-9, one fixed mica condenser, .002 microfarad; N, one neutralizing condenser: half a pound of No. 24 double cotton covered wire for winding coils L-0. L-1, L-2, L-3 L-4; bakelite tube 21/2-inch diameter and 5-inch long for L-0; bakelite tubes 3 inches in diameter and 21/2 inches long for L-1, L-2, and L-3, L-4; three wooden spools for intermediate frequency transformers, T-3, T-4, T-5; half a pound of No. 36 double cotton covered wire for these transformers; T-1, T-2, two audio frequency transformers; J-1, J-2, two double circuit jacks; J-3, one single circuit jack; S-1, one inductance switch with five switch joints; S-2, one double pole, double throw jack switch; R-1, R-2, two 10-ohm rheostats; R-3, one 6-ohm rheostat: R-5, one 12,000 ohm grid leak with mounting; eight UV-201-A tubes with



panel without using "arm extensions," | for C-1 and C-2; six binding posts; three and all the parts inside the cabinet may | 4-inch dials; one panel 7-inch x 26-inch x be reached from the top of the box.

The antenna tuning coil L-0 is placed 25½-inch; one cabinet to match panel and in the extreme left hand corner of the baseboard; one 6-volt storage battery; one cabinet, directly behind the antenna in- 120-volt plate battery, with a tap at about ductance switch S-1. The axis of this 60 volts; one shield 6 inch x 25-inch x coil is mounted in a vertical position in 1-16-inch and one 6-inch x 6 inch x order that space may be conserved and 16-inch, brass or copper.

3-16-inch; one baseboard 9-inch x %-inch x

#### How to Build a Simple and Efficient Five-Tube Receiver as turn No. 8 goes over the same pins as the fourth turn. This cycle of turns again creates a magnetic field, which is staggered

ME owner of the receiver to be letted thereto. This sub-panel is not

This receiver was designed by A. Fig. 3 gives the reader a clear con-W. Franklin, chief engineer of the ception of this transformer and shows

that is easy to tune and operate.

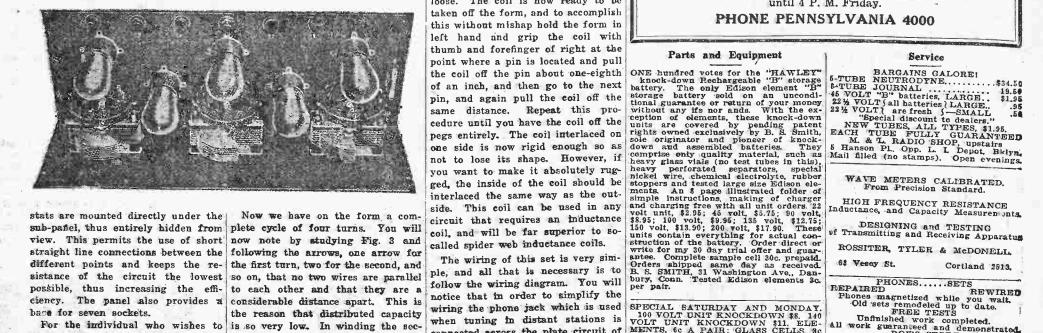
All details of the construction of carefully the directions to be given. the set, as you will note in the ac- The tuning unit in the radio frecompanying cut, have been carefully quency unit may be any well designed worked out so that there is a mini- 23 plate (.0005 Mfd.) variable conmum amount of labor involved in asshown in Fig. 4.

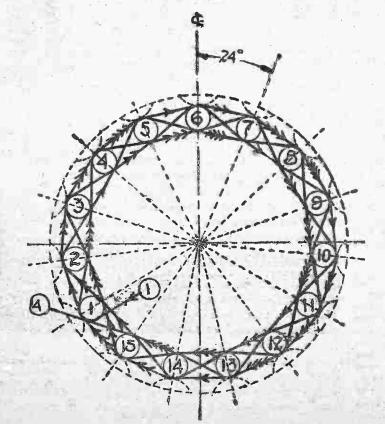
Charles Freshman Company, and is how it may be wound at home. First, being placed on the market under the trade name of "Frank" and the trade name of "Frank" and the trade name of "Frank" and the trade name of the trade name the trade name of "Freshman Mascircle 1 5-16 inches in diameter; upon terpiece." The directions given in this article will make it possible for fifteen holes evenly spaced. These this form of winding. any radio fan to duplicate the com- holes provide a snug fit for 1/4-inch The circuit will be found in Fig. into pieces 1% inches long, rounding 1, and from this it can be seen that off the free end with sandpaper. the receiver is a five-tube radio fre- These pegs should be glued in to the

tuned radio frequency, detector and of the disk are to facilitate the intertwo stages of audio frequency ampli- lacing on the outside of the coil. This also makes it possible to log under two pegs and over two pegs so on until you are around the entire

fication. There are three tuning con- After the form is finished proceed tom of coil through the inside corner trols, one to each stage of radio fre- with winding the coil as follows: next to pin 15, thereby bringing the quency, and one to tune the aerial Hold the form in your left hand with needle again to top of coil. Next circuit. The controls are evenly the pegs pointing toward you and bring the needle through the furthest matched, so that in tuning all dial lay the wire over pegs 1 and 2, then corner to pin 14, and then from botreadings will be practically the same. inside of 3 and 4, over 5 and 8, then tom through other ends to pin 14, and

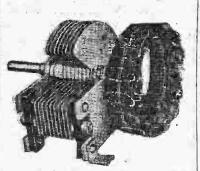
the only apparatus visible when the started, which is over two pegs and time through the corner next to peg cabinet is opened are the three tuned then under two and so forth until 1. This loops the turn around peg radio frequency units, the grid con- the third turn is completed over 15 twice, and after the ends of threads denser and leak and the tubes. All and 1, then the fourth turn is wound are tied with double knot there is no





#### No. 2. Seven follows the same path British Radio as turn No. 3, while turn No. 8 goes from the field made by the first four

The coils of wire are each sepadescribed in this article will entirely necessary, however, and good rated by a space equivalent to the results may be obtained without it. enjoy a radio set that excels in The radio frequency units are the tion, thereby suffering practically no in volume and clarity on both local next things to be described. These absorption losses through the adjaand long distance stations and one units may also be purchased com-



wooden dowels. Cut wooden dowels winding process is completed cut the of the coach was located inside. There ber of turns as above, and after the instead of being strung along the top wire, leaving it long enough for a were two antenna wires stretched suitable lead. In order to interlace through the car from end to end. quency set employing two stages of holes. The recess on the peripheries slide it off the form without collapsing, secure a medium sized binding carried on over a distance of 100 needle and a spool of white thread miles. The power used was only a and guide the needle through the few watts. Although a complete reccorner next to peg 1 from the top of ord of the tests has not been made the coil. Recess A on the bottom of public, it is understood that railways the form will enable you to go past officials are much impressed with the the form with needle and thread. results. Now pass the needle from the bottom of the coil through the other corner next to pin 1, hold the end of the thread with one hand and pull the thread tight with the other hand.

Next guide the needle from top of the thread tight with the other hand.

Next guide the needle from top of the thread tight with the other hand.

Next guide the needle from top of the thread tight with the other hand. No "For One Day Only" Sales until you come back inside of 15 and coil. When the interlacing is done It will be noticed from Fig. 2 that 1, after which the second turn is up to peg 2, lace the thread a second chance of the winding ever becoming loose. The coil is now ready to be taken off the form, and to accomplish this without mishap hold the form in left hand and grip the coil with thumb and forefinger of right at the

cency. The panel also provides a base for seven sockets.

For the individual who wishes to duplicate the receiver described herein, the sub-panel may be purchased from the Freshman people, completely drilled with sockets and springs eye
cency. The panel also provides a considerable distance apart. This is the reason that distributed capacity is so very low. In winding the second cycle of four turns, the fifth turn is laid over and inside of the same from the Freshman people, completely drilled with sockets and springs eye
century of the panel also provides a considerable distance apart. This is the panel also provides a the reason that distributed capacity wiring the phone jack which is used when tuning in distant stations is connected across the plate circuit of the first audio tube. This permits the use of the phones while the loud speaker is in operation. Also notice that in order to simplify the wiring the phone jack which is used when tuning in distant stations is connected across the plate circuit of the first audio tube. This permits the use of the phones while the loud speaker is in operation. Also notice that in order to simplify the wiring the phone jack which is used when tuning in distant stations is connected across the plate circuit of the first audio tube. This permits the use of the phones while the loud speaker is in operation. Also notice that in order to simplify the wiring the phone jack which is used when tuning in distant stations is connected across the plate circuit of the first audio tube. This permits the use of the phones while the loud speaker is in operation. Also notice that in order to simplify the wiring the phone jack which is used when tuning in distant stations is connected across the plate circuit of the first audio tube. This permits the use of the phones while the loud speaker is in operation. Also notice that in order to simplify the wiring the phone jack which is used when tuning in distant stations is connected across the plate circuit of the first audio tube. This p the set from oscillating. In tuning a set of this type it is

best to set the two dials in the radio frequency circuit to the highest point usually used, which may be on 90, and then try to tune in a station by turning the first dial, which is in the aerial circuit, slowly until the station is heard. If there is no station broadcasting on that particular wave length the two dials should then be turned down two divisions and the antenna dial turned again approximately within ten divisions of the same setting as the other dials. This should be continued, setting the deals two divisions lower each time until all the stations on the various wave lengths are logged, after which it is a very simple matter to tune in the same stations by simply referring to the previous log.

Transmits 200 Miles With A One-tube Receiving Set

Some stations sure do some surprising work with exceptionally low power. The latest is a record established by 8DOX. He worked 200 niles with the detector of his receiver, which had only forty-five volts on the plate.

BACK numbers Science Invention, Wireless Age, Everday Engineering, Popular Radio, Roundless Colence, Radio News, Popular Radio, Broadcast. Some 1915. Lustig, BAGLE BATTERY CO., 242 West 145th st. Bradhurst 3461.

### Fans Transmit From Train obtained from the British rossomes. The circuit used is the loose coupled

LONDON. tests of last year the signals of this Experiments having to do with the station were heard more than eighty reception and transmission of radio times by amateurs in America. signals from a moving train have been carried out successfully in London by a number of radio amateurs connected with the Radio Society of Great Britain. On a run from this city to Newcastle, a distance of 276 miles, messages were exchanged with Station 6XX, London, and amateur tations along the route.

Station 6XX is the official station of the Radio Society of Great Britain. and through prearrangement with Philip R. Coursey, secretary, it was made available for the experiment. A special car was attached to the

Scotch Express through the courtesy of the London & Northeastern Railway Company. This was fitted up with an amateur transmitter and short wave receivers. Unlike most Proceed winding the required num- experiments of this kind, the aerial

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229 East 14th St. Lexington 3662.

A BARGAIN 8-TUBE E. I. S. SUPER-HETRODYNE loop, head phones, loud speaker, "A" and "B" batteries, \$ 201A tubes. new. Going abroad next week. First customer will get the set for \$150. Call Sunday afternoon or from 6 to 9 p. m., all this week. Phone Morningside 0880. SEI-FIDDIN, 510 W. 124th st., apt. 56. RADIO and phonograph combined, with 5-tube Neutrodyne, complete, nothing nore to buy, \$135. 73 W. 119th st., FYPE 201A TUBES, UV199, WD11, WD12,

\$4.25 each. Write for our complete price list of bargains. The RadioMart, 693 Mission st., San Francisco, California. AMBASSADOR, complete, best parts, phones, tubes and batteries; \$50. Phone Dumont 952, Box 464, Dumont, N. J. B. tteries

How Radio Receivers Have Changed in the

Last Twenty Years

Broadcasting Has Made Necessary a Set for the Living Room

By ALFRED G. GOLDSMITH, Ph. D.

Chief Broadcast Engineer, Radio Corporation of America

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The text of The Herald Tribune Radio Magazine is the best on the subject published by any newspaper. The amateur is given really instructive articles on how to build and the advanced fan finds his proper diet in selected scientific articles by well-known authorities.

It publishes about the right amount of human interest stories and contains the largest proportion of text matter, in relation to advertising, of any Radio Section in any newspaper.

### Policy of Station

The new station WFBH, New York City, "The Voice of Central Park," has laid down "14 points" on which it a very short time are:

Military training lessons. 10. Sunday programs standing by. evening concerts. 11. Daily luncheon music (5-8 p. m.). 12. Daily dinner music (6-7 p. m.) 13. Midnight ren-

including James Lockwood, Alvin Hauser and Pat Kiley, are other reasons why the station should gain a good deal of time from the public's a juvenile program at 9 a. m. Marine Band and the Goldman Band ears. These supervisors are trying - Good choral singing is an inspira- broadcasting will not suffer a great what they want.

forgive the mistakes that may be it is well broadcast. made while the station is in its

Hotel Majestic. It is a 500 tuned same station, WJZ. grid circuit operating on a 273-meter wave length. The aerial is 210 feet

with velour hangings to strengthen the usual hour. the acoustics for broadcasting.

The most unusual feature is that the artist can stand in the room and vival for the new week, for we nothat it is limping along on its sumsing, forgetting all about the micro- tice a number of events that should mer schedule, making no undue efphone, which eliminates the so-called make good listening matter. On fort to release itself from bondage. microphone fright," because they are concealed in the room.

Wednesday evening the Romos family However, one little bright spot manages to sparkle on its program for

roof. The studio is equipped with opinion of their playing. two grand pianos.

The artists can be seen, at all being one of the station features that no one, other than the announcer, is permitted to be in the studio but the performing artists.

WJZ's New Children's Hour Meets With Approval

About six weeks ago station WJZ New York, omitted from its program the daily radio bedtime story hour in an endeavor to determine just how popular that feature of broadcast programs is with the listening youngsters, and substituted instead the Sunday morning children's hour from 9 until 9:30 o'clock. To date the number of requests for the reinstatement of the bedtime story on the daily program has been practically negligible, indicating that the day of the "Peter Rabbit" broadcasting has passed, at least so far as the desires of New York children are concerned. The substitution of the Sunday morning hour, in which noted writers tell their own original stories, celebrities in child circles speak, and the leading cartoonists explain the antics of their comic characters, has met with decided favor with both parents and

100 Amateur Stations in Spain Fernando Castano, of Madrid, Spain, in a letter to the American Radio Relay League, advises that organization that there are now about 100 amateur radio transmitting stations in his country following decition is the "Radio Club de Espana."

### WFBH Announced The New Week on the Radio

1. Public medical advice from the the skids of forgotten events into world's famous authorities. 2. Edu- what appears to be certain oblivion. On Tuesday evening WEAF makes Humorous discourses on events of the early days of WJZ's history, and entertainment of the week by broad-

dezvous (11:30 p. m.-2 a. m.). 14. proval, and another fond theory of our broadcasters exploded quietly. On Monday evening, the 4th, the With this evidence of its previous U. S. Marine Band will play again John Niles is chief announcer. The folly before it WJZ has decided to from WEAF. We do have a lot of permanently forsake this form of band music during the summer

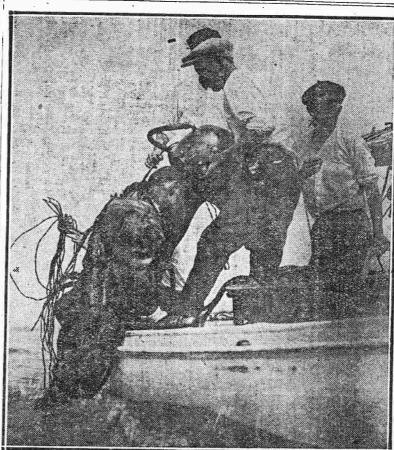
hard, as shown in their outline of the tion to many and we cannot refrain deal. fourteen points, to give the public from mentioning Dr. Charles W. Allen's Church Community Chorus. There is one thing that Mr. Hauser It will sing this afternoon from WJZ. "Radio Franks" (Frank Wright and asks of the public for the service that There is something restful and up- Frank Bessinger) are professional he is going to render, and that is to lifting about this type of music when "song pluggers," but this has not in-

"We may not be as good as other cert given by the students of the of the best popular song artists on stations at the start," Mr. Hauser music course of the New York Uni- the air at the present time. They said, "but it will all come in time. versity Summer School was broadcast are on the new program of WEAF. Improvements, arrangements, systems through WJZ. Like the first concert, (This is not intended for an expose.) and small details will be taken care we enjoyed it immensely, and it of as soon as we have the chance." measured up to the standards of a He also invited suggestions and criticisms at a real get-together dinner Tuesday, August 5, the third of the the broadcast from the triangle of triangle of the triangle of triang The transmitting apparatus of the station is located on the roof of the Hotel Majortic Victoria (Majortic Victoria) and station is located on the roof of the Washington Square, and through the it wholeheartedly.

above ground and 72 feet above the the Mall in Central Park has grown normal. More than the usual numroof. The distance between masts is to be an institution in broadcasting ber of features smile at us from the 110 feet, having an inverted "L" all of this in the short space of two advance notices and not a few of months. Goldman's program this them are quite new, although not en-The studio of the station can be week is interesting in that it will tirely untried. This is a favorable seen from the outside. The walls and include only English music. It will report to give in the very middle of ceiling have especially been draped be broadcast Wednesday evening at our hottest season.

Broadcast controls and signals are never missed the opportunity to say Monday night. The Newark Philharoriginal, permitting constant com- kind things about this capable or- monic Concert Band will play at 8:15 munication between the broadcast chestra and we have yet to meet the o'clock. studio and the operating room on the listener who thinks little about our

Although we would advise Dr. Sig- remember Roy Cropper. He will times, through a double plate glass partition which separates the studio fectly good lectures on the Common day evening, and this with the Romos from the reception parlor. All artists, or visitors to the station, are will broadcast directly after the station, are will broadcast directly after the that is also the night of the Goldman this reception parlor. Artists are paged in their turn of performance,



sion of the government to permit amateurs the use of wave lengths below 150 meters and up to 100 watts power. The leading radio organization is the "Radio Club de Espana."

A new kind of broadcasting was introduced to the radio audience last Thursday when C. O. Johnson, a diver for a Philadelphia salvage firm, talked from the floor of the Atlantic off a pier at Atlantic City through is the "Radio Club de Espana."

The bedtime story has passed. Yes, vain, and we are always disturbed will broadcast. Features that are the bedtime story has passed, and one to see such splendid lectures as those planned and that will be adopted in of the most solidly entrenched traditions of broadcasting is rolling down good.

cational topics of public interest. 3. The bedtime story was invented in another valuable contribution to the the day. 4. Children's lullabys. 5. like all traditions it hung on for no Competitive lyric suggestions for apparent reason, eating up its usual chestra has not broadcast before, it songs. 6. Competitive contests for half or three-quarters of an hour at is well known and there is not the one-act plays. 7. Cameo operettas.

8. Memory tests of old songs. 9. dinner time with more propitious slightest possibility of a disappointment. It plays for many of the state ment. It plays for many of the state

Marine Band and the Goldman Band

terfered with the enjoyment we have received as a result of their work, A short time ago the second con- The fact remains that they are two

All considered, the program for the The Goldman Band concert from new week looks a little better than

WOR does not hold out such prom-WEAF appears to be staging a re- ise for the new week, and it seems

> Those who have consistently patronized the "Follies" cannot help but

# many modern broadcast listeners. Mounted on a board were coils, condensers, primitive detectors and a variety

of electrical switches and parts, all con-

nected by straggly wiring, which had ap-

parently been spun over the equipment

by a disorderly and demented spider. A

multitude of adjustments assisted in con-

fusing the user and afforded the experi-

menter-owner great pleasure, since he

rarely knew what was going to happen

when any particular knob was turned.

To the inquiring and experimental turn

of mind such sets were quite satisfactory.

Certainty of operation and handsome ap-

pearance were neither present nor desired.

Of course there were some exceptional

sets which were both carefully constructed

and easy to handle, but they were not as

highly regarded by the average experi-

menter as the "junk pile" variety of set.

only to a comparatively limited group in

the community under such conditions, and

radio receivers of this primitive type were

capable neither of rendering a public

service nor yet of beautifying the homes

of their owners. An occasional message

of no general interest was all that one

could hope to receive on the frequencies

or wave lengths devoted to commercial

traffic. Amateur operation was relatively

unorganized and commercial and amateur

transmitting sets were chiefly distin-

guished by their amazing capabilities in

producing bad interference. As to ap-

pearance, a radio set in the home in those

happily distant days was a constant

source of dispute, since the domestic au-

enthusiastic owner locate it in some re-

mote and inaccessible corner of the gar-

ret, rather than in a living room, where

the eye would be continually offended

somewhat more prepossessing radio re-

ceivers. One was the commercial ship

set designer, who was forced to produce

reasonably rugged and neat-appearing

sets. The other was the mature amateur,

with a mechanical bent, who was capable

of building apparatus of fairly attractive

appearance. Accordingly the panel type

of set came into existence. In this set

all parts were mounted on a vertical panel

of insulating material, which also formed

the front of a wooden box. Such sets

came into wide use and were found so

comparatively easy to wire and to main-

tain in good condition that they have

survived up to the present. One of the

changes, not externally visible; which

helped to improve the sets was stiff or

"form" wiring. Instead of flexible and

rambling wires, stiff wires were bent

sharply into correct shape and used to

connect the various electric parts of the

set. Such wiring was not only neater but

more permanent. It is now used widely

The panel type of set had the additional

advantage that all adjustments were con-

in high-grade receivers.

Two early factors combined to produce

Naturally radio could be of interest

HE amateur receiving set of fif- | knobs could be arranged symmetrically | fewer than nineteen adjustments. Engi- | cial construction of the box. They could and all metal parts polished, thus presenting a fair appearance. Such receivers always look like scientific apparatus rather than furniture, and they do not merge readily into a handsome living room any more than would an uncovered sewing machine. There is also the temptation to multiply adjustments on such sets past all reasonable limits. It

neers viewing it were rather puzzled as to how such a mechanism could be successfully driven through heavy radio

Another problem encountered in the panel type of set was the proper location of the binding posts or terminals, the batteries and the loud speaker. Binding posts on the front panel were conspicuous is recalled that at a certain radio ex- | and generally led to frowsy wiring. hibit in Boston a receiver costing \$100 | Placed at the back of the set, they were was shown which was provided with no | relatively inaccessible and required spe-

sary, therefore, to take every precaution

to insure that the facilities will be avail-

able at precisely the time set for their

use and that no interruption of any sort

will occur during the speech. This means

the provision of two complete circuits ever

separate routes. These two circuits are

so arranged that the entire speech simul-

taneously flows over both of them, and

they are so terminated at the broadcast-

ing station that the operator at this point

can immediately transfer from one to the

other practically without the loss of a

syllable. Not only must duplicate circuits

be provided, but all work along both of

the routes that might in any way inter-

rupt or interfere with either circuit must

The length of time the circuits are re-

quired for an undertaking of this kind

and the costs involved have but little re-

lation to the time taken to transmit the

speech itself. For example, to prepare for

the transmission of a speech from Wash-

ington to Chicago it is necessary to make

tests and adjustments which require that

the two circuits be removed from their

regular service for a total period of some

six hours, in order to precisely determine

the electrical characteristics upon which

is dependent the success of the project.

Since such circuits cannot be released

from regular business without seriously

interfering with it at any time other

than the late evening and the early morn-

ing hours such testing as is done at these

times involves overtime work. Actually,

the circuits are set up and tests conducted

for a period of three hours the night

preceding the speech, and again for an-

other three hours immediately preceding

An undertaking of this kind also re-

quires the use of a telegraph circuit dur-

ing the testing periods and during the

speech to co-ordinate the work at the

transmitting end with that at the broad-

casting station and all intermediate re-

not be eliminated, however, from any but self-contained unit type sets, which did not then exist. Storage batteries, such as were necessarily used with the earlier panel sets in the absence of the present efficient dry battery radiotrons, and plate batteries in the form of large assemblies of individual dry cells or flashlight units were very unsightly and difficult to locate in an unobtrusive position. The telephone headset was also not particularly ornamental, and the loud speakers which later succeeded the headset were still not very aesthetic. Panel type sets, therefore, look ship-shape, scientific, and busi-

#### Connecting Radio Broadcasting Stations.

Continued from page one

eet below level of announcer's booth, so that he can see clearly what is going on. 10. Press gallery.

11. Speakers' platform and seats for

broadcasting stations, so that constant communication is maintained with all elements of the broadcasting system. Separated by a partition from input

Due to the fact that there is a general

The toll plant of the Bell System has been engineered and constructed for

9. Delegates in pit, which is several | methods, special apparatus and a trained personnel. In broadcasting a speech of national

12. Telegraph system connecting all

lack of understanding by owners of broadcasting stations and others, as to the amount of labor and equipment involved in such an undertaking as connecting up a number of stations by land telephone lines, the American Telephone and Telegraph Company has issued to officials concerned with such work, a detailed circular

The number of telephone circuits required and the actual length of time they are used, quite aside from the period during the actual delivery of a speech, constitute an important phase of the problem and explain the reasons for the relatively high costs as compared with ordinary

transmitting telephone messages between individuals using standard equipment, where the message is conveyed directly from the mouth of the one to the ear of the other. The use of toll circuits or any telephone circuits in connection with radio broadcasting is distinctly not the use for which they were designed and intended, and telephone circuits in their usual commercial service condition are generally unsuited for this purpose.

For the ordinary transmission of a telephone message a degree of intelligibility entirely satisfactory for the purpose is secured by transmitting a relatively narrow band of speech frequencies. For satisfactory radio broadcasting such a band of speech frequencies is inadequate to convey the degree of naturalness upon which the personality of the speaker depends. In order to transmit a band of centrated into a single vertical plane and | frequencies of sufficient width for this were therefore readily accessible. The purpose, it is essential to use special peater stations.

ness-like, but they are not particularly artistic, nor in full consonance with the remainder of the domestic furnishings. importance involving the use of the toll plant a failure or interruption would reflect upon the Bell system. It is neces-

Photographs of the various types of receivers under discussion accompanying this article indicate clearly the nature of the problem of adopting radio receiver design to the beauty of the music produced and to the atmosphere of the home. As long as radio was an experimenter's pastime and nothing more, the development of radio receiver cabinets was slow. But when radio broadcasting became a great public service, and in place of a few thousand experimenters there came into existence millions of daily listeners, the problem of appearance became more acute. There was a marked incongruity in having a delightful concert, played by a leading orchestra, come out of an arrangement that reminded one of the oldest portable swinging horn phonographs. now happily obsolete. There was the same discrepancy between a tastefully furmachinery placed in the midst of it. An artistic unity was demanded by the more discriminating broadcast listeners, and this unity has now been achieved in a variety of ways.

The first step was obviously to place the batteries, terminals, loud speaker and all previously external parts into the receiver cabinet so that (except possibly for the antenna and ground) the entire set was self-contained. This disposed of casual parts formerly scattered over a table or desk top. It also enabled mounting such parts once and for all in the most favorable relative positions for casy use.

it was desired to uncover this panel for field of elaborate cabinet design was riety of shapes and sizes. Vertical cabinets and horizontal cabinets or consoles have been used. Cabinet's resembling phonographs have disputed the field with cabinets resembling jewel chests or desks or grandfather clocks

Since the panel mounting for the control handles still had to exist in one form or another (although it is indeed tremendously simplified and improved in appearance in well designed modern sets), it was natural that the next step was the designing of a suitable wooden cabinet to contain the whole receiver, which cabinet would conceal the operating panel unless adjustment purposes. At once the entire opened up and both plain and "period design" cabinets were tried in a great va-

### What Every Fan Should Know About Radio Receiving Circuits

There Are Few Standard Circuits, but Many Variations

By SIDNEY ELBER

-Fleming Valve

#### Part 11

7 HILE searching for a suitable filament for the electric light Edison noticed that one of his little glass bulbs possessed rather strange characteristics. The one in particular contained not only an experimental filament, but also a small metal plate suspended within the vacuum but separated from the delicate filament wire. He found that by connecting the positive side of a battery to this plate and the negative to one side of the filament a galvanometer inserted in the battery circuit would indicate an actual flow of electricity, despite the fact that there was no complete metallic circuit. The great inventor at the time was seeking to perfect an electric source of illumination, and although this strange phenomenon interested him, he passed over it casually and did not interrupt his now famous filament investiga-

The "Edison effect," as the strange action became known, developed into a scientific novelty and gave physicists much to talk about, but it was hardly dreamed two decades ago what an influence it would have on the newly born science of wireless telegraphy and telephony. It revolutionized both arts and made radio what it is to-day, the Eighth Wonder of the World.

A famous English scientist, Fleming, took one of Edison's queer two-element electric lamps over to England, and there succeeded in making them act as "detectors" of high frequency radio oscillations. Now, a detector of radio waves is a device which allows the electricity to flow through it more readily in one direction than in the other. Certain natural minerals, such as galena, silicon and carborundum, possess this property, for reasons unknown to man. It is frequently assumed that peculiar molecular arrangements are responsible, but this is only a hazard. Certain chemicals in contact with platinum wires also exhibit this ability. Crystal and electrolytic detectors had been used with fair success, but the announcement of Fleming's valve marked a most important step in the radio art and set the entire scientific world agog.

#### The Detector

The detector is the heart of any radio circuit, and here was a radically different detector, which held forth great promise. Practical engineers, though, found it sadly disappointing, as it proved to be little better than a crystal in sensitiveness, and even inferior in the matter of tone quality. What it did do was to open to science a virgin field for experiment, and it was not long before startling discoveries were

As two-element tubes are used even today in certain reflex hook-ups in place of a crystal, because of their greater stability, some typical circuits for the Fleming valve are given as a matter of interest. The first is shown in Fig. 1. Here we have a coupler, which might be any loose or vario-coupler, whose secondary is shunted by a variable condenser for tuning and whose primary is tapped for the same reason, the earphones and

Notice that the plate and filament are connected to the tuner just the way a ern Fleming valves) should try this cir- | using it. The simplest receiving circuit it | becomes more sensitive to weak signals, cuit; they will then fully appreciate the can be used in is the one of Fig. 3. Here and also tunes more sharply. worth of a good piece of crystal.

A decided improvement results from the addition of plate battery, as shown in Fig. 2. In the batteryless set the current flowing through the phones is the weak one picked from the passing radio waves, but here it is a strong battery current, which is modulated by the received impulses. The signals are thus much louder than before, but still nothing to become ecstatic about. The condenser same function as a grid condenser in a | are built.

we have the inevitable coupler and condenser for tuning purposes, the tube, and its accessories, such as the A and B batteries and filament rheostat. A grid condenser, "Gc," is also shown, though it really can be omitted from such an elementary circuit, with slightly less efficient

This arrangement should be tried

Although fairly sensitive as a straight

detector of radio waves, the three-element

tube did not come into its own until the

invention of "regeneration" by Edwin H.

Armstrong. Regeneration is an action

which makes the tube a thousand times

more sensitive than it would be normally.

Briefly, it is an action whereby part of

the comparatively large amount of energy

present in the plate circuit of the tube is

fed back into the grid circuit, with a con-

sequent lowering of the grid circuit re-

sistance. Now the grid is what controls

the plate, so the increased energy in the

grid circuit causes an increased variation

in the plate, and then the cycle starts over

again. It cannot continue indefinitely, but

is limited by what is called the "satura-

Now, the strength of a received radio

signal depends on the plate current, and

in strength is had by the use of a regen-

tion point" of the tube.

in that current.

merely for the sake of the experiment. The circuit is a simple, non-regenerative, plate and grid circuits. This is the least detecting affair, and is about as useful for practical purposes as a good crystal receiver. It represents the foundation on "Cp," by the way, does not perform the which a thousand and one other circuits

> Tuning the plate is a favorite and widely used method of obtaining the desired regenerative effect. In practice, though, a fixed coil in conjunction with a variable condenser is rarely used; a single variometer does the same work instead. A practical circuit is shown in Fig. 5. This will immediately be recognized as a rather familiar one. Indeed, the coupler, condenser and variometer receiver need little introduction to radio fans, as it is one of the most satisfactory ones ever devised. It tunes sharply, gives good volume and faithful reproduction and is gratifyingly sensitive to distant stations. Its one bad feature, one that is common to all regenerative sets, no matter how they are disguised, is that it radiates and causes squeals and whistles in other sets when being tuned by the average broadcast listener. This one uncondonable fault is rapidly driving it and other regenera-Tuned Plate As long as the plate is tuned it makes

little difference how the grid is controlled. Either a condenser can be employed, as in Fig. 5, or a variometer ("Vg"), as in Fig. 6. The latter set is probably even better known than the condenser one, for the "two-variometer outfit" has been used everywhere since Paul Godley designed it nine years ago. Either of these two circuits can be considered as fundamental "tuned-plate" ones for practical purposes. In the next article will be shown how variations of them are devised.

Fig. 7. Here we have the pertin moved to and away from "S."

From the connections it can be seen that the plate current flows through the primary of the coupler. Due to a magnetic action which is thereby set up, part of the plate energy is fed back to the grid and the amplification process takes place as explained. This is a simple and obvious scheme, and in practice works to perfection. Tickler circuits in general are more flexible than tuned-plate ones and have many variations. Some of the most notorious ones, the ones which have been heralded so blithely as "new" and "astonishing" circuits, will be discussed in the next article along with tuned-plate adap-

So much for theory. Regenerative feedhack can be produced in three ways. One is to couple the plate to the grid circuit magnetically; that is, through a coil of wire placed near the grid coil (the secondary of the tuning coupler). Another is to use a condenser common to both circuits: this may be formed by the condenser effect of the elements of the tube itself. The third method is to directly connect the desirable of the three.

The simplest regenerative circuit is that of Fig. 4. Here the plate is tuned by a coil and condenser, and the circuit is known as the "tuned plate regenerator." The feed-back of energy takes place through the tube itself, as the grid and plate, being metallic bodies, act together as a small condenser.

Not one bit less popular than the tuned-

plate system is the "tickler" idea of regeneration. This comes in the magnetic feed-back class. The basic circuit is shown tuning coupler and condenser, and also another coupler, which serves an entirely different purpose. The latter is marked "Cp" and consists of a fixed secondary, "S," and a primary, "P," which can be

The most noteworthy example of a

tickler circuit is the three-honeycomb affair. It rivals the two-variometer receiver in general excellence, and is about as popular. Here the tickler coil is directly coupled to the secondary of the tuning-coil system. The primary, secondary and tickler ("P," "S" and "T") are also the extent of the variation or change | all honeycomb coils, supported in a suitable mounting. This circuit in particular It can therefore be seen that an increase | should be kept closely in mind, as it is the one that has been most adroitly manipu-

#### Last Week on the Radio

umn no less than three new studios brothers in crime. We only regret have come to the air in New York that we cannot post this list in every City. They have added nothing to studio in the United States. It would the prestige or the entertainment do so much good to broadcasting: value of the ragged art of broadcasting. For the life of us we cannot understand what manner of purpose causes a street railway to seek the "Eileen"). ether as an outlet for music and My Little Dream Girl. speechmaking. Is it merely a substitute for a "Subway Sun," or can it be that it is an act of pure altruism? It is difficult to believe that it is the latter. Perhaps the purpose will be revealed as time goes on and we shall find, as we have found in all other cases, that the value of the ether as a grinder of axes has been overestimated by ambitious officials.

It seems that the time is ripe for the institution of some gigantic movement whereby broadcasters will continue only by public indorsement. The results of a national vote would prove to be a sad blow to the majority of the lesser lights who unload all manner of truck into the horribly mutilated ether of space. We could name no less than seven broadcasters in New York City alone who would not survive such a test by hundreds of thousands of votes.

tice to WJY we publish his letter:

"Sir: In looking over your column must first forsake the beaten path.) in The Herald Tribune of July 17, the second paragraph, first column, is called to my attention. I am refer- Dear Pioneer. ring to Irving Selzer and his orches- Sir: You poor ignoramus, don't tra, who have been broadcasting for you know Alfred Noyes's "Highway-

but is done directly from the studio said "He lay in his blood on the here, so that the clause in this para- highway.' graph relative to poor wire transmis- Incidentally, it would pay you to engineering staff they experienced no air." You have many radiosyncra-

"I am very glad to have noted in your columns recently that you have

opportunity you will drop into this "dramatic readers" make a very wide station and see us, and with all good detour around our organs of apprewishes, I am cordially yours,

by us. Of course, this may or may joint with radio studios. That's that not have been the fault of the broadcaster. Reception was so noticeably bad that we just naturally assumed fallible, and on the other hand we have yet to find the transmitter that sions in the United States and Can-

your column, your insuperable aver- year and discussed radio legislation, sion to barytones and sopranos has international amateur radio and kinbeen brought forcibly to my atten- dred subjects. tion. I have also noticed how you All of the directors were present complain about certain songs, such with the exception of Allen H. Bab-

more peaceful frame of mind than ronto, Canada.

"And so, I turn to the 'Pioneer' in Cuban Amateurs Use his field to aid me. May I count on your assistance? Many thanks in advance. Yours very truly.

that we might be a little useful to he says that amateurs are allowed broadcasting after all. For three use of wave lengths from 75 to 200 years we have been trying to murder meters.

Since writing our last weekly col- "Tommy Lad" and his three or four

Some Day I Shall Know. While the Leaves Free Trade and a Misty Moon (from

Old Virginny Days. Dormi pure (Scuderi's). Almost Persuaded. On the Road to Home If I Were King of Ireland. Won't Yez Kape Me Company? That's an Irish Lullaby. A Little Bit of Heaven. I Lost My Heart. I Don't Think I Need a Job. If I Were as Strong as Samson. The Blacksmith. Fuzzy-Wuzzy. Ever Bravest ("Faust"). Oft in the Stilly Night.

Allerseelen. This list could be extended to include hundreds of other ballads and songs never before broadcast. The barytone parts in the operas alone are so numerous that space will not permit us to mention them. (Note: Charles B. Popenoe, manager of This service is free and will be gladly Stations WJY and WJZ, corrects a expanded to include sopranos. Those recent statement of ours, and in jus- who strongly feel the broadcasting urge and desire mention by Pioneer

"Pagliacci" (Prologue).

Madame Sherry.

Ivy Green.

Lost Chord

man"? "She" didn't say "she lay in "This is not a remote control event, his blood on the highway." "She"

sion does not apply. If there was any quit your knocking long enough to difficulty on transmission of this listen to that same "lady dramatic event it was done in the station here, reader," who can also sing circles but as far as I can ascertain from the around most of the people "on the sies! Lovingly yours,

FRANK and EARNEST.

enjoyed the New York Philharmonic | As a matter of fact we don't care Orchestra, and I think I am safe in who was in whose blood on the highsaying, after four years of broad- way. We have been "Dan-McGrewed" casting, that to my mind it is the and "Gunga-Dined" so much that we best event that has ever been put out simply bolt when people are murby a radio broadcasting station any- dered on the highway and left there in their own blood. Morbid recita-"Trusting that when you have an tions never did appeal to us and lady ciation when they come before the "CHARLES B. POPENOE." microphone with semi-suitable bunk We still stand by our guns and in about some terrible murder. Such sist that the music on this occasion recitations fit the atmosphere of was not received in good condition afternoon teas, but they are not in

A. R. R. L. Directors Meet that it was due to wire trouble. However, if Mr. Popenoe wishes to risk by President Hiram Percy Maxim, indictment in this way we have no was held in Hartford, Conn., the objection. Our receiver is not in-morning of July 25. The directors

The directors listened to reports of "Sir: In my constant scanning of amateur progress during the past

as 'Duna,' 'Tommy Lad,' 'Manda-cock, of the Pacific Division, and lay,' 'Invictus,' 'Pale Hands' and Harry F. Dobbs, of the East Gulf Dimany others, being sadly overworked vision. H. L. Reid, of Atlanta, Ga., sat in at the meeting as Mr. Dobbs's "It has occurred to me that some- alternative. The following were prewhere in your musical fancy there sent: George L. Bidwell, Washington, lurks a desire to hear certain songs D. C.; Clyde E. Darr, Detroit, Mich.; sung over the radio that are not Cyril M. Jansky jr., Minneapolis, done very often. If you know of a Minn.; Benjamin F. Painter, Chattafew such numbers for barytone, nooga, Tenn.; L. Boyd Laizure, Kanwould you favor me by naming a sas City, Mo.; George H. Pinney. South Manchester, Conn.; Karl W. "I hope to arrange a program that Weingarten, Tacoma, Wash .: Tredwill be devoid of hackneyed numbers, way Gravely, Danville, Va.; Paul M. in this way hoping to keep my listen- | Segal, Denver, Col.; Frank M. Corers awake until the end of the group, lett, Dallas, Tex., and A. H. K. Rusor at least to put them to sleep in a sell, Canadian general manager, To-

Short Wave Lengths

Aside from the fact that no amateur spark stations are permitted in Cuba, regulations regarding amateur transmitting stations are very lib-We do not know of a more pleas- eral and somewhat similar to those ant task that we could perform, in the United States, according to F. This is one of the few times that we W. Borton, of Havana. In a letter to have been able to convince ourselves the American Radio Relay League



A Tuned Radio Frequency Receiver

that will bring even the most distant stations to your home with surprising clarity and volume. can pick up any station you want -- night after night-at the same settings, and, world to

Chas. Freshman Co., Inc., 106 Seventh Ave., New York



crystal is. Owners of "diode" tubes (mod- Now that we have a tube, let us begin | crative "feed-back." Incidentally, the set | iated.

textbooks on the subject.

Filament ..

regular tube set. It is merely a stopping

condenser which prevents the plate bat-

tery from short circuiting through the

tuning coil. At the same time it does not

obstruct the alternating radio current.

The Third Elemen.

It was not until Dr. Lee de Forest, a

Yale graduate and an active engineer,

put the third element, the grid, into the

two-element valve that things began to

happen. Volumes upon volumes have been

written on the wonders of this Aladdin's

Lamp of modernity, but it is sufficient to

say that it does everything claimed for it.

and a lot more. The tubes in all present-

day sets are three-element tubes, and they

are too familiar to warrant detailed ex-

planation, also purely theoretical con-

siderations dealing with the electron

stream and its caprices will be left to the

### Radio Extends Audibility Range be found, and some of us can go and hear them. But here again most of radio, let us say to hear a famous like it we change. If the ear at the

**Broadcasting Stations Enable Man to Hear Events Beyond Normal Limits** 

By R. H. LANGLEY

every one knows, has thou- than see the scene itself. gives him a different picture of his than his eyes. He could see great studios where carefully chosen artists best place in the whole building from annual conference of the executives surroundings. All his eyes, however, distances, he could look into the can send them into the hotel dining less of whether this is in a seat, on for home. He is accompanied by L. are bunched together, and every eye very depths of space, and with the rooms where dance orchestras are the ceiling or in midair. Men who W. Staunton, advertising manager of sees almost the same scene. The only telescope and the microscope see the playing, and we can send them to are experts have been there before- hand and have found this the best consults with the advertising agency. is to go to the new place and take the smallest) things in the universe. He could only hear over very limited his generous supply of vision along distances, a few thousand feet, and

His two eyes see just about as much as the fly's many eyes, and he has to move his whole body around the radio broadcasting. world if he wants to feast his eyes They bring him more or less faithful that may be between two persons and the speeches of the political lead- performance, and protected from Street, London. reproductions of distant scenes and a tremendous help to us.

take, and no one would choose to where the feasts for the ear are to ing.

HE ordinary house fly, as look at even a motion picture rather great cities to hear the symphony by radio we have the best seat in the W. A. Bartlett, managing director

there were no instruments to in- places where we cannot go. They Man is pretty much in the same fix. crease this power of hearing.

> Telephone Use Then came the telephone, and later

starting its fourth pear, we can send and we would not know, until the perour ears into a dozen different places formance started, whether it was a wish to. We can send them to the not have good seats. When we go sands of eyes. Each of them Man's ears were even more limited ers; we can send them into the ter than the best seat. It is the very

Radio Range

To-day our ears can go to many can go out across the miles and listen entertainment we take our two ears tional advertising. who must talk to each other. It is ers. They can even go into the any disturbing noise. If it is a Before going abroad for the Bran-

so it also provides many fine things have recently attracted our attention the pulpit, another for the belfry, and turing Company on the radio sales for us to hear. Some of us, a very are very large, as such places go, but so on. There is an operator there force. He is optimistic over the But the fly can see the pictures, limited few, can find the time and it would have been quite impossible to change us from one ear to another radio situation in Europe and says too, so man is not much better off, the means to travel and see some for even a thousandth part of those as the service proceeds. so far as seeing is concerned. The small part of a beautiful world. The who sent their ears to these places Each evening we have hundreds of greatly. Upward of one million repictures may not mean much to the rest of us must stay at home and by radio to have been there them- electrical ears, carefully placed for ceiving set licenses have been isfly, he may misinterpret them, but from pictures and books. Also, some ears and mine to these places, but the country. We sit quietly and comman frequently makes the same misfew of us live in the great centers everybody's, and there is no crowdfortably at home, and we make any ing KDKA and WGY on short wave

be found, and some of us can go and | When we send our ears away by where we please, and if we do not us cannot hear things, or could not orchestra, it is not at all like going Chicago hotel is not entertaining us ourselves. If we should go person- we change to one in Philadelphia, or Radio broadcasting extends our ally we should have to be content Montreal. The miles between us ears. Even to-day, with this new art with the best seat we could obtain, have lost their meaning. of amusement almost any time we good seat or not. Many of us would Brandes Official Returns to **England After Conference** 

Coast Juard Crew At

orchestras; we can send them into house. Every one who goes by radio of Brandes, Limited, England, who churches to hear the famous preach- has his best seat. In fact, it is betof the English company with a view to co-ordinating the Brandes interna-When we go in person to hear an

in places where, even if we had the along and use them as best we can. in September, 1922, to found a branch time and the means, we could not Unless we are very fortunate we miss of Canadian Brandes, Limited, which gain admission. They can enter the gain admission. They can enter the The telephone in its present state great national conventions, for ex- others near us, who are not as in- new plant for the manufacture of of development makes it possible for ample, and without inflicting any dison some new picture. Photography any one to talk to anybody almost comfort on the rest of our body that and the printing press have, of anywhere. It extends our ears and stays at home, they can hear the carefully placed for us to catch shire, England. The executive offices course, done something for man. our voices, and annihilates the miles deliberations of the political parties every syllable and note of the of the company are at 296 Regent

White House and sit beside our Chief church, there is one ear to hear the des Company. Mr. Bartlett was atthings, and the motion pictures put But just as the world provides Executive when he reads his message.

White House and sit beside our Chief organ, or perhaps two or three. There tached to the New York office of the a measure of animation into these many wonderful things for us to see,

The great convention halls that is another for the choir, another for Westinghouse Electric and Manufacone of those ears our own. We listen lengths.



#### Long Island Radio Shop

139 Ashland Place, B'klyn At Long Island R. R. Station. WE SPECIALIZE IN 1 - 2 - 3 - 4

TUBE ERLA REFLEX **SETS** These sets give finest results during summer months. No static. No distortion.

The Cole Collapsible Loop will operate a 4-tube Erla Set.

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Radio Tube Mfg. Co., 154 Nassau St., Now York Mast Orders Given Prompt Attention All

ALL TYPES SATISFACTION GUARANTEED
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206 BROADWAY NEW YORK
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For best concerts tune in the MUNICIPAL RADIO BROADCASTING STATION

For best prices on radio supplies and sets come to the Municipal Radio Company No. 1 Park Place, N. Y. Tel. Barclay 0382

SEND FOR OUR COMPLETE MONEY SAVING CATALOG

FIMES SQUARE AUTO SUPPLY CO

MAIL ORDER DEPT. NEW YORK, N. Y.

#### Shall I Buy A Radio This Summer?

Some thousands of prospective radio fans are asking themselves this question. From their friends they have "caught the bug" and are thoroughly determined to have a set of their own, but are laboring under the mistaken impression that they won't need it until the fall season sets in. Much more than in previous years the summer of 1924 offers entertain-

ment for those who are privileged to isten to things in the air. The recent national Republican and Democratic conventions were enjoyed by many thousands who never before had come to a realization of what a wonderful miracle radio really is. There is no question but what thousands of new recruits were added to the ever growing list of

fans to whom life would be dull and incomplete without their radio. Even more thrilling than the conventions will be the campaign speeches. These warm weather days are stirring days in the political field, where party lines are being

strained and broken. Entertainment for those interested in sports is also plentiful. Baseball scores from the big leagues and prize fight returns are among the attractions in the athletic world. All things considered, if one is contemplating a radio at all, there is everything to justify getting it

A glance at the following list of things available by radio now will further support this conclusion. Things You Will Miss By Not Having

a Radio This Summer Presidential campaign speeches, baseball scores, prize fight returns, church services, camping and motor talks, hotel dance orchestras, Phil-harmonic and Goldman contexts, dinner music, hot weather food suggestions, children's programs and fashion



DISTANCE and selectivity are a your set around AIR-KING! NO switch points.
YOUR DEALER HAS FREE
HOOK-UPS

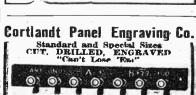
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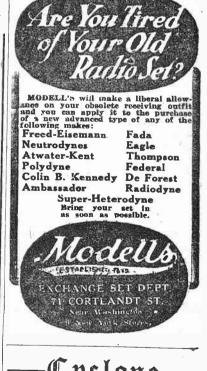
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Manufactured to order in all sizes—of every description. Can supply dealers or jobbers with any quantity. Factory capacity 4,000 per week.
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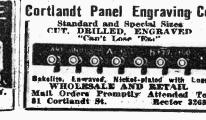
MANHATTAN ART RADIO CABINET CO. 553 W. 53rd St. Tel. Columbus 6375.



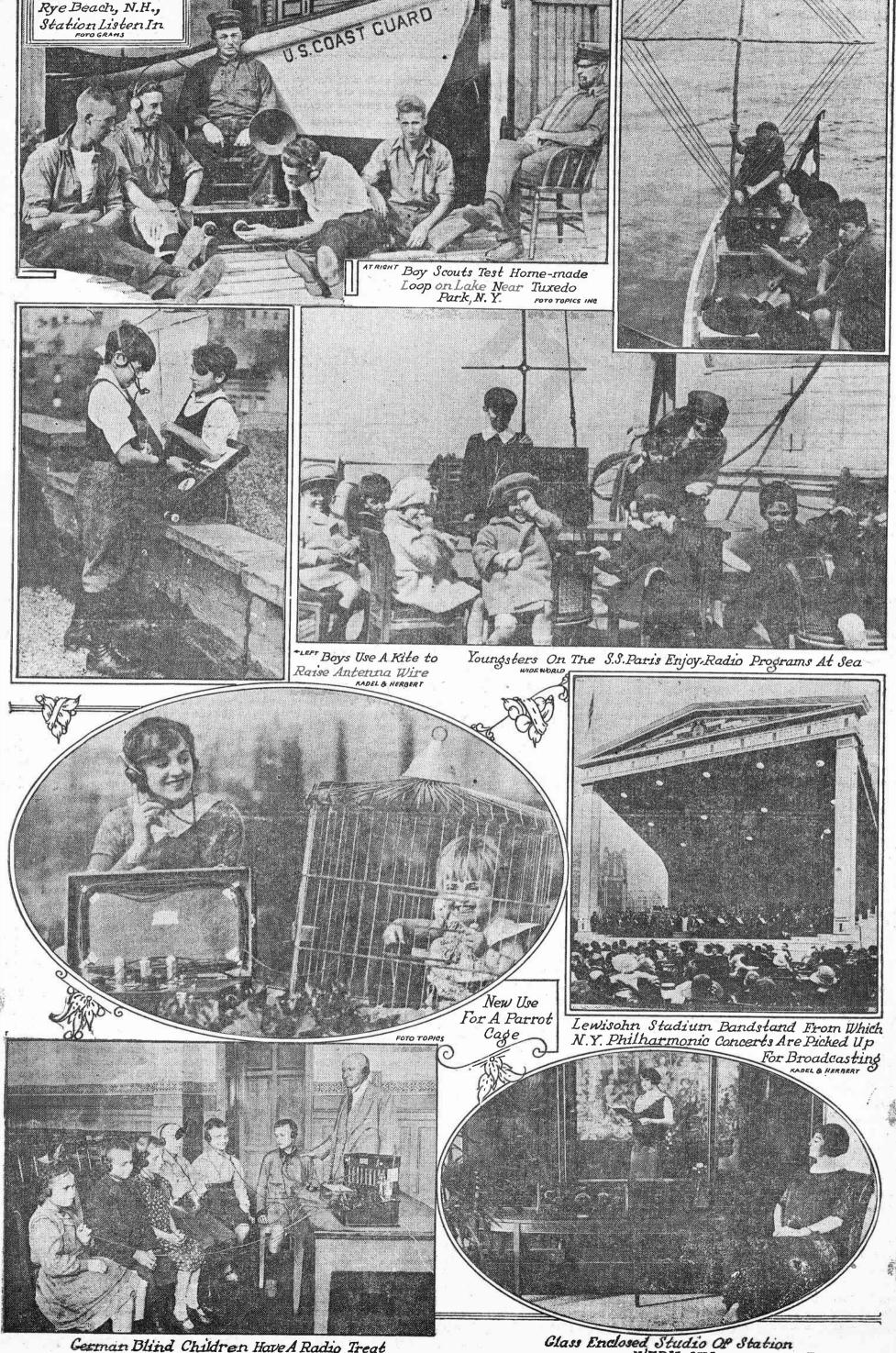






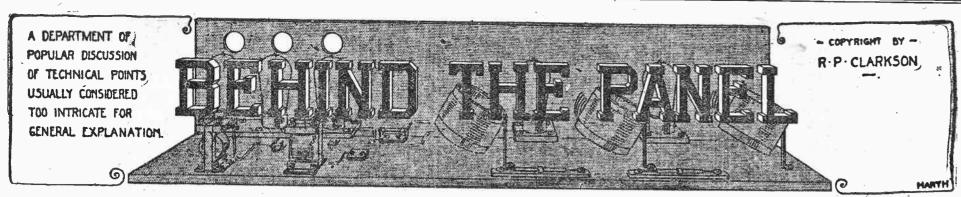


### Up-to-the-Minute News of Radio in Pictures



Glass Enclosed Studio Of Station WIBH NY.

Design Bridge



TOW is the time to experiment a bit | hydrogen when the current tries to go | galvanometer, while with the flow in the | crystal purposes, silicon is used with a with your crystal receiver if the tube set is laid aside or is being overhauled in preparation for the big doings this winter. Almost any one can afford a crystal set. In fact, if you have a pair of ear phones there is almost no expense involved. All you need for the crystal set is some form of tuning device, a variety of crystals and a holder for them, and a fixed condenser. This is old stuff, of course, but those of you who have teen working with tube sets so long have

one way and the resistance is too great for the current to overcome, while when the current goes the other way no film is formed and the circuit is of low resistance. Then there are various thermoelectric explanations depending upon currents set up within the crystal combination. There are also contact theories based on the fact that two dissimilar materials in contact may, if the contact is moist, form a tiny battery.

Whatever is the explanation, the current passes only one way. If you have other direction there will be considerable deflection, if the galvanometer is sensit ve.

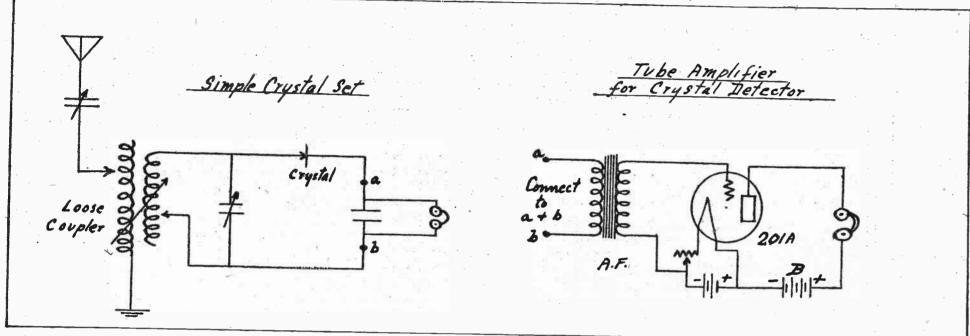
#### Piezo Electricity

This has no connection, of course, with that other crystal phenomenon we hear so much about, and which is called the piezo electric effect. Very little has been done | ing. The effect to which this name is in utilizing the piezo effect in commercial instruments, but in experimental laboratories there have been most marvelous results. It is worth experimenting with while playing with crystals, and although | property that when electric potential is there are but few experimental data to applied to them at the proper points a access to a sensitive galvanometer you go by, a little explanation will enable you stress is produced and the crystals may

small potential across it.

#### Special Crystal

For the piezo electric effect, however, none of these is a suitable crystal. "Piezo" is a Greek word which conveys the meaning of pressure or squeezgiven refers to the property of certain solids to develop electricity when subjected to a twisting or torsional action. Most of these crystals have the reverse



**Standard Apparatus** 

Radio-Frequency Transformers

EGARDLESS of the great desirability of the regenerative receiver, which

tubes mean added distance. There will be this fall, more than ever, an attempt

to build the last word in radio receivers, and the attempt will be along the lines

thing is as likely as another to prove satisfactory. We have heard a lot about

resistance coupling of late and many inquiries ask how good it is. In my judg-

ment resistance coupling as set forth so far by any radio writer is bound to be

unsatisfactory except as to cost. I do not mean that it is not good, but it is no

better than any other form of coupling and although cheaper in first cost is

more expensive in upkeep. To get the same volume as with transformers, you

of a transformer connected as a resistance is connected in, using the blocking

condenser in front of the grid of the succeeding tube. It strikes me from

experimental work as well as a consideration of the problem from a purely

theoretical standpoint that this form of coupling should be developed. Let's

see what can be done. It surely ought to be as satisfactory as two-coil trans-

former coupling. It ought to give as great, if not greater, volume because

there is no loss in coupling. It is as simple as resistance coupling and almost

as cheap to build. It does away with the troublesome feature of tuning which

ordinary R. F. transformer primary, with perhaps 25 per cent added turns to

start, and broadened with an iron core made either of soft iron wire or of iron

filings which may be mixed up thick with melted paraffine. This mixture is

The choke coil should be an inductance, of course, of about the value of an

We have not heard much about choke coil coupling, that is, just one coil

The coupling between radio-frequency tubes may be anything, and one

of radio-frequency amplification, either neutralized or not neutralized.

must use one more tube and considerable higher "B" voltage.

is necessary to variometer coupling.

poured into the core hole and allowed to harden.

I believe should come back into into its own before many months have

passed, it is no doubt true that a vast majority of the fans believe added

probably forgotten how simple the crystal set is.

For a tuner there is nothing better than the old fashioned loose coupler and you can pick them up for almost nothing nowadays, as they appear to be a drug on the market. In fact, for playing around experimentally, the two slide tuning coil isn't so bad and those which sold for \$3 and \$4 a couple of years ago, I see are marked down as low as 75 cents now. Use a 23-plate condenser across the secondary even if it is tapped or even if you use a slider. I like a condenser in the primary, too, for convenience,

Then for the hook-up almost any way of arranging the parts will be satisfactory. The most obvious and common way of using them is to place the secondary, the crystal and the fixed condenser all in series in a closed circuit and connect the phones across the condenser. This arrangement is shown on this page and can be used as a starting point for your efforts. Sometimes a fixed condenser is put across the crystal and the claim is that this increases the signal strength very materially.

On the crystal set it is just as important that the low voltage points should go to ground, as on any other kin of set, so be sure the rotary plates of the tuning condensers go to the ground side and be sure the flixed condenser across which you put your phones is on the ground side of the crystal.

#### **Crystal Action**

As we know, the crystal is simply a rectifier. No one has given an accepted theory of how it acts to rectify. Some scientists have an 'dea that because of the internal construction of the crystal itself it can conduct in only one direction, but most of the experimenters feel that the one way conduction has something to do with the fact of the contact between two dissimilar materials, either the catwhisker and the crystal or the two different crystals. There is a thought that the point of contact heats up and we have somewhat the same effect as in the electrolytic rectifier, where one plate gets covered with

can see this for yourself. Connect the to have considerable fun in connection crystal, the galvanometer and a battery in series and arrange to reverse the connections on the battery, remembering that the carbon pole (at the center) of a dry cell is the positive pole and the zinc pole (at the outer periphery) is the negative pole. Outside in the circuit the current is supposed to flow from the positive pole around through the hook-up to the negative pole. Only by reversing the battery connections, therefore, can you reverse the direction of the current flow through the whole circuit. By reversing the crystal connections, of course, you can change the direction of flow through the

with your radio experiments.

In the crystal sets we use for the crystal either the manufactured product produced and sold under all kinds of trade names, or such crystals as galena for sensitiveness, or carborundum, where a more rugged material is essential. Usually where carborundum is used a battery is connected in the circuit to impress half a volt or so across the crystal and thereby make it more sensitive. Another combination is the zincite-pyrites arrangement, really the doing away with the catwhisker and using another crystal in its place. In place of plain copper crystal. With the flow in one direction | pyrites, the crystal bornite, which is a there will be almost no deflection of the | copper ore, is substituted. Sometimes, for

actually have a sort of swelling or dila

The difference in the action of the crystals used in a radio receiver and those used in obtaining the piezo electric effect may thus be made clear by talking about the effects in terms of energy. In the radio set the crystal merely permits current to flow in one direction and absorbs the energy in the other direction, so that no current flows. The piezo crystal, on the other hard, is not a rectifier of energy, but is a converter of energy. It will convert mechanical energy into electric energy or electric energy into mechanical energy. Such piezo crystals also have remarkable optical effects and will rotate the plane of vibration of light waves passing through them.

#### Many Piezo Crystals

The piezo electric effect appears to be undoubtedly a property of the structure of the crystal and its growth. There are many of the common substances, such as camphor, quartz, sugar and the like, which have marked piezo action, but probably the greatest effect is obtainable with Rochelle salt crystals and, strange to say, so potent is the effect of growth that by careful preparation effects have been obtained twenty times that of the natural or normally prepared crystal.

To observe the phenomena it is desirable to mount a crystal of Rochelle salt in metal tips. These tips should be of a low melting point alloy, such as Woods metal, and should be located at the ends of the principal axis of the crystal. A metal girdle is placed around the central portion of the crystal and a twisting strain set up between the ends, whereupon very considerable potentials are developed between the girdle contact and the pole tips.

The usual way of using this form of crystal is to arrange a diaphragm so that singing or speaking against the diaphragm tends to twist the crystal. Even this effect causes a potential of 12 or 15 volts on open circuit, and a current of upward of 18 microamperes will flow.

For many purposes the crystals may be arranged to work in parallel, and thus the effect produced by them may be built up. Many stunts between radio programs may be readily arranged by the fan to amaze the inhabitants. The most natural arrangement and that most written about is the use of the crystals as amplifiers, using the microphone suggestion in the previous paragraph.

teurs have admitted doing so and locals. gave as their excuse that they received information that there was no Rumor has it that 2BQZ is going objection to their using the wave to start up again in the fall with a lengths below 200 meters. This is an husky spark set. What is the matter entirely wrong impression and should with the tubes. OM? A little fivebe corrected at once.

where the amateur was reported he good spark set. did not violate the terms of his license, but was received on his first should, however, make every reason- He blames it to the brushes. able effort to eliminate such harmonics, as often times much energy is lost through them.

be willing to co-operate.

plate supply is sixty-cycle AC un- fall. usual results are being obtained. No difficulty is experienced in carrying in daylight.

will not be heard long, as a new chemical rectifier is almost near completion. He also says he has the

2AWT is still burning up watts spark coil plate supply. with his old spark set. However, good work is done on it and the operator has a good "fist." He expects to have plifier for his CW and phone outfit the CW set in operation before long. that is to employ a two-hundred and

can't get a good CW note, notwith- be able to work local stations. GN, standing the fact that six microfarads we'll say so. of condenser and a fifty-henry choke coil are used. Judging from the way it sounds the apparatus is doing its not heard so often as he used to be work quite efficiently.

his short wave tuner with No. 12 operation by falt: wire. A marked improvement was noticed on the first trial. We also mitter has been increased.

receiver is 2EX. He says with a another fifty-watt tube in the course bunch of coils lying on the table of a week or so to operate in parallel all districts have been copied within with the other two. a few hours.

a single five-watt tube, with either being covered. a high or low plate voltage for high and low power, respectively.

inch cage aerial, which is higher single circuit tuner and one step. than the one previously used at that Using an indoor aerial, stations station. He says his antenna current within a radius of 100 miles were dropped to about half what it was be- copied with surprising audibility. On fore. However, he seems to be doing his trip GC also had the misfortune better DX work than ever. FB OM. of being involved in an automobile

2CYQ reports hearing WNP. He says he was using a low loss tuner An old-timer who has recently that has been giving good results started up again is 2BQC. At present on amateur wave lengths. CYQ also 60-cycle AC is used on the plates has a new transmitter in operation of his tubes, because of trouble that and is trying hard to work him. Go was experienced with the rectifier. to it. OM.

Another old timer who recently returned to brass pounding is 2AZY. The transmitter has been completely supply on his new transmitter. Acrebuilt, but still employs the same cording to reports, fine results are five-watt tube that made the station being obtained, and much traffic is famous last winter.

2AIC, a promising new station, has 9DYT has come to the conclusion just appeared on the air. The equip- that there is nothing like the short ment used at present includes a lone wave lengths. He may be heard workfive-watt tube with three-hundred ing both coasts almost any time of volts of AC on the plate. Good re- the evening with a lone five-watt sults are being obtained in spite of tube. This station also has many the power and plate supply.

HE bureau of navigation of 2SY changed his former cage anthe Department of Commerce tenna to a five-wire flat top, with a has received a large number five-inch cage lead-in. He says with of reports to the effect that ama- the old cage it was impossible to teur stations are operating on wave work south further than Washinglengths below 150 meters, which is a ton, in spite of the fact that all other violation of the terms of their directions were worked with ease. With the new aerial, however, he In some of these cases the ama- works fourth district stations like

watter would carry twice as far and It appears that in some cases still wouldn't be as expensive as a

2WA is another station doing good harmonic. This condition is not only work on phone. At times he is able found in amateur stations, but in all to filter his generator hum out enkinds of transmission. The amateur tirely and other times not so well.

2KR had a fifty-watt tube in operation for only two weeks and then it The bureau also states that few of went "west." For a short time a the amateurs knowingly violate the UV 201-A tube was used with 350 law, and where they are found to volts on the plate. With only eight violate and continue to disregard the watts input he was heard by 6EB and law after being notified the license is English 6LJ. On phone he worked usually suspended for three or more amateurs in most every state this months. This is done to protect the side of the Mississippi. At present a law-abiding amateur and all should single five-watt tube is used and good results are being obtained. He contemplates installing a fifty or 2CBC is another station with a one-hundred-watt transmitter tube, new CW transmitter. Although the with "S" tubes as rectifiers, before

2BMR recently installed a "sink" on two-way communication with sta- rectifier for his five-hundred-watt tions in the first and third districts outfit. Although the note obtained is not pure DC at local points, reports show it to be good at a dis-2CXE has been overhauling his CW tance. However, it is much better transmitter for the coming fall. He than the old AC plate supply, and we promises that the sixty-cycle CW nota understand a good filter is in the course of construction.

After a short silence 2CGS reparts for a good filter system. turned to the air with much more pep than ever before. He still uses the same five-watt tubes with the

2CG is building a new speech amfifty-watt tube as oscillator. He 2WR has been complaining that he says with the new set he ought to

We have just learned why 2RM is He works in the Alamac Hotel at nights and sleeps all day. He ex-2CNJ has rewound the coil for pects to have a fifty-watt tube in

2BFP is doing some good work with understand the power of the trans- two fifty-watt tubes on both phone and CW. With an absorption loop for modulating the output he has Another station using a temporary good modulation. He expects to have

2ASV is another station doing ex- getting good results with "S" tubes cellent work in spite of the summer as rectifiers is 2CZX. With two fivestatic. The CW transmitter employs watt tubes remarkable distances are

2GC took a trip to Lake Hopatcong last week, and along with him was 2BBE recently erected a new 18- a portable receiver made up of a accident.

> The rectifier will be in operation again, however, in a week or two.

> 2BXG is using a 500-cycle plate passing through the station.

other remarkable records to its credit.



### Summer is the time to build your FADA Neutrodyne Receiver

DON'T miss the wonderful radio tion by building 5-tube FADAS to programs. Build a 5-tube FADA be ready for fall. Build now. Buy Neutrodyne Receiver now. The the FADA 5-tube knock-down long evenings give you lots of day- Neutrodyne Receiver from your light. Then, when it is complete, you can enjoy the concerts, the political events, take the receiver on your vacation and keep in constant touch with the latest happenings.

Even in summer static doesn't interfere with reception of local programs. Boys everywhere are making the most of summer vaca-

dealer and build it in spare time. It's easy.

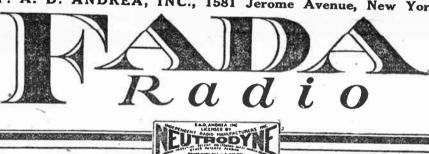
The FADA book, "How to Build FADA Neutrodyne Radio Receivers," comes with every outfit or is sold separately for 50 cents. Complete detailed instructions with diagrams and pictures. Ask your dealer for the FADA Knock-down Kit No. 167-A. Price \$65.60.

#### TO DEALERS

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F. A. D. ANDREA, INC., 1581 Jerome Avenue, New York





There is no higher quality. Ask your dealer to show you

the type of Cunningham Radio Tube, designed to meet

### President's Example

You want the best receiving set in the world. So did President Coolidge. He chose the Super-Heterodyne.



Super - Heterodyne Kit

has proved that the Super-Heterodyne is the best set in existence.

#### Ask for Akracy

The secret of Super-Heterodyne supremacy lies in the Akracy Kit, consisting of one input transformer, three intermediate frequency transformers and one oscillator coupler, all perfectly matched. The price is

Nationally Distributed by Sunbeam Radio Sales Co., Inc. 1834 Broadway, N. Y. City

By mailing us this coupon you can get FREE the complete set of charts and photopraphs on how to build the Super-Het (ordipary cost \$2.60).

CUT HERE .... My Name is..... My Address is.... My Dealer is..... Dealer's Address is.....

#### UESTIONSE ANSWERS

This Week's Most Interesting Question

P. F. Sneed-I have recently been sary to notify the insurance company of the British Broadcasting Company. and that an increase in premium rate developed by the new engine of on the policy takes effect with the science to lengths undreamed of in installation. Kindly advise if this the last great conflict.

writers has certain rules that must power stations will soon be erected be complied with in the installation which will cover half of Europe as of an outside aerial. When these easily as 2LO (the call letters of the rules have been adhered to and an "The director of broadcasting servserial is installed properly, then one ice will become automatically the of the three things must be done. director of propagands. Tales of the First, the owner of the house can unworthy enemy will be told by the notify his insurance company that very men who had suffered at his an aerial has been installed on his hands, news of the progress of events. house and that he wishes to have an of actions stubbornly fought and inspection made by them. When the bravely won, of incredible air duels inspection has been made, and if the two miles above the earth-of everyaerial passes inspection, a warranty thing, in fact, that will foster pride is issued which is attached to the and admiration in the hearts of those policy. No increase in insurance who only stand and wait' will be repremium is charged. Second, the tailed daily to the listening public. house owner can notify the Board of Fire Underwriters, located at 123 tain Lewis, "which in the past has William Street, New York City, for New York State, that he desires an inspection of the aerial which he has installed. This inspection costs \$1, and if the aerial is perfect a certifined to the colors by a voice speaking from general headways and simultaneously summand if the aerial is perfect a certifined from general headways are speaking from general headways are set of the colors by a voice speaking from general headways are set. is then sent to the insurance company and attached to the policy. This copy is made by a notary public.

"Enemy stations tuned exactly to Keep the original.

to the Board of Fire Underwriters out transmission. We shall be doing and state that an aerial has been in likewise. A race for higher and stalled and ask for the list of rulings higher power stations will begin, each with, then the certificate sent with our coasts oscillators friendly to the the rulings should be filled out and lenemy will attempt to spoil reception sent to the insurance company. In by howling throughout the transmiseither case no charge is made in the sion. way of an increased premium, nor "The air menace will be the great-

Department of the board.

#### 45,000-Cycle Super

James Gray-The diagrams in my copy of The Radio Magazine for the 45,000-cycle super-heterodyne are very west pocket like a cigarette case. It difficult to read. Is there any possi- is designed for use with portable bility of getting clearer ones? Kindly aerials which are likely to be intell me where to get a loop as de stalled in the near future on omniscribed in the article. Answer-If the diagrams in your

suggest that you get another from the circulation department of this the set efficiently. These may be pocket the set and phones before bought in large radio stores.

Three-Circuit Trouble

John Burroughs-I have a threecircuit tuner, variocoupler, 2005-mfd. new angle that Godfrey Isaacs, the variable condenser and a variometer with one stage of audio-frequency amplification. It is only possible for me to use about half the condenser—above that no signals are heard. The future transmission will be less in-

Answer-A series condenser, fixed. in the aerial circuit probably will tions has been getting too full but enable you to use the variable con- under the new system you use the denser throughout its range. Too ether only for the beam along which large a variometer, too much "B" bat- you are communicating, and that tery or too large a grid leak will should make an enormous difference. cause foggy signals, and also a grid The possibility now opened up of condenser that is not of the right innumerable stations operating with-

#### Super Heterodyne Unit

James L. Shaw-Will the four-tube problem." unit as described in The Radio Magazine for making any set a superhetrodyne operate with a generative receiver having an untuned primary coil and tickler feedback? Will it director of the B. B. C., speaking bework with dry cell tubes such as the WD-12? The article states that condenser C3 is used to complete the Character Cartes and condenser C3 is used to complete the C4 is used to condense the C4 is used to condense the C5 is used to complete the C5 i C3. and that is not in the oscillator later Caxton standardized English circuit. Is this a typographical error? spelling, so it is not inconceivable Can the intermediate frequency selector be obtained on the market? English pronunciation."

specified in the article. The tubes. During the installation of a 500you mention are not good radio-fre, watt transmitter and higher antenna quoncy amplifiers, and therefore, towers WHW, Tarrytown, N. Y., will though the set would operate with be off the air. Service will be rethem, full efficiency would not be ob- sumed about August 10. The owners tsined. C2 is the condenser that com- of this station are said to be arpleton the oscillating circuit. It has ranging to locate a studio in New a capacity of .005 mfda. York City.

#### Radio News From Our British Correspondent

LONDON-Graphic and lurid pietures as to what broadcasting was going to do in the next war were advised that in order to install an painted this week by Captain C. A. outside aerial on a house it is neces. Lewis, the famous "Uncle Caractacus" Propaganda, he predicted, would be

"Broadcasting will be a valuable

Answer—The Board of Fire Under-country," said Captain Lewis. "High

ing from general headquarters. But

"Enemy stations tuned exactly to Third, the owner may just write out a steady succession of X's to jam the broadcast wave length will send that must be followed to protect the trying to swamp the transmissions house. If these have been complied of the other by this means. Within

does it decrease the value of the est danger. Enemy raiders, besides concentrating on munition factories For surbanites all communications and dumps, will have special orders to to the Board of Fire Underwriters locate and destroy transmitting censhould be made to the Suburban De- ters. So all studios and gear will be partment of the board at 123 Wil-installed underground, only the aerial liam Street, New York City. Address on a pair of flimsy mests, difficult all communications to the Electrical to bomb and easy to replace, showing above ground."

The Marconi Company is developing a crystal set which will fit into a buses, trains and streetcars for the benefit of the public. The telephone copy of the magazine are not clear, earpieces are about the size of a ten-cent piece, so that passengers as they approach their destination can paper. Any good loop will operate just unelip from the aerial and alighting.

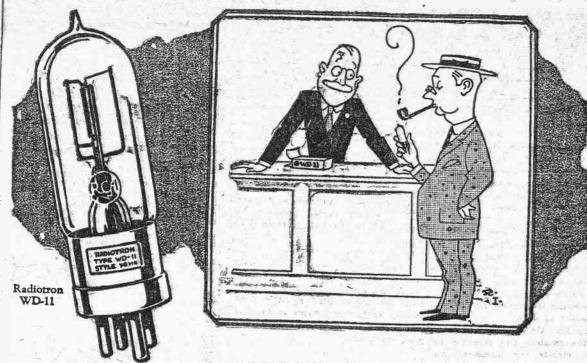
> Speaking of Marconi recalls the Senator's man Friday, revealed recently on the possibilities of the new beam system.

Mr. Isaacs predicts that in the

"The ether under existing condiout interference from one another is very important at a time when interference has become rather a serious

Radio is going to improve the

Answer—This unit may be used on any set by making the connections as WRW Temporarily Closed



# Don't Buy Just Tubes!

If you go into a reliable store and ask for a vacuum tube, you will probably get a genuine Radiotron. because most reputable dealers carry nothing else. And most buyers mean "Radiotron" when they say "tube." But the wise man says "Radiotron." And he takes the precaution to look for the name on the base, and the RCA mark on the glass. Those names have a history of invention, research and development back of them that has resulted in the production of the finest tubes possible today. And they have a history of best performance right within every fan's experience. That's why knowing fans buy by the name: Radiotron.



It isn't a genuine WD-11 unless it's a Radiotron.

It isn't a genuine WD-12 unless it's a Radiogron.

It isn't a genuine UV-199 unless it's a Radiotron.

It isn't a genuine UV-200

Itisn'tagenuineUV-201-a

Radio Corporation of America

We have in Stock COMPLETE PARTS

### THE "BEST" above that no signals are heard. The signals are not clear, but seem to be forgy. Can you suggest a remedy for mission. future transmission will be less interfered with by the increasing air traffic owing to the directional transmission.

45,000 CYCLE

We endorse this circuit for the following reasons:

- 1. Simplicity of construction. 2. Economical in first cost and
- future operation. 3. Use of dry-cell tubes without
- sacrifice of volume, 4. Low "A" & "B" battery consumption.
- 5. Maximum amplification without distortion.

6. Ultra-Selective and Super-



If you want to buy, sell or exchange your radio sets or parts the Radio Exchange will help you



U. S. Tool Company, Inc. as Sole Distributors in New York Territory for the Coming Year: Continental Radio & Elec. Corp.

R. H. McMann, Inc. McPhilben Elec. Radio Corp. Jamaica, L. I., N. Y.

Wireless Klein Co. New York City On Sale By All Good Dealers U. S. TOOL CO., INC. 117-119 Mechanic St., Newark, N. J.

BLOWOUT PREVENTOR At Last! Economical Tube

Insurance 50 CENTS INSURES YOUR TURES 50 CENTS INSURES YOUR TURES.
AND SETS.
PREVENTS BLOW OUT OF TURES.
PREVENTS EXCESSIVE YOUR SHORT CIRCUIT RISES. Orden from your dealer or from Rusonite Products Corporation

#### From a Broadcast Announcer's Four New Short Viewpoint

Human Frailties Pass Him in Daily Review, but a Sense of Humor Leavens All

#### By ONE OF THEM

inals in each one of us; law- library. yers, clients in legal difficulwith us—every broadcasting appliwith us—every broadcasting applithere is this difference, we think we 150 to 200 meters. proved an artist.

Naturally, established reputation the little dog Jo Jo is lost? We are is quick proof for our purposes, yet very sorry, but dog announcements experimental purposes. offtimes, like paupered titles brightly fall short of even threadbare selections. Pocketbooks, children and even the short wave lengths from 25 to 300 with their apparent freshness conceal but our charity begins in the studio. Opera Company. In other words, "Tell you. But don't forget that we have them (meaning you) how marvelous our joke daily, sometimes oftener. I am. before they hear me." Afterward well, you who read have suf- Copper in the fered. What further comment is needed? Moral: Sprinkle such statements with salt, let them momentarily slip your mind; after the first

#### Human Frailties Divulged

We announcers see human frailty and radio stature. Each day brings artistic temperament, which includes and telephones in the United States all the failings mentioned. From the (viz., 15,000,000), and that this will collarless, perspiring orchestra boys likely occur in five years' time. In men, the world passes through our use in the next five years 5,000,000

As in the home, so in the studio. tors, lawyers, bankers, pugilists, ac- fittings. tors, songsters and prodigies! For The manufacturing end of radio is

#### A Friendly Welcome

The artist who brings new selections, even though poor ones, is well-comed. Ditto for the one who doesn't want letters, who is satisfied with a war letters, who is satisfied with a war letters, who is repeated by the public lengths requested.

Wisc of Mr as an introduction, who was first attempted by the Public lengths requested.

Was first attempted by the Public lengths requested.

Health Service in July, 1921, when operating stations every Saturday mailed from Washington to all cooperating stations every Saturday morning throughout the year. These raphy only will be permitted on wave believed to be the first health and the statempted by the Public lengths requested. Miss or Mr. as an introduction, who placements to finished sets, the home-quits when the time is up, who brings made set is numerically much more lengths other than 150 to 200 meters, and the antenna circuit must not be the speaker who doesn't cough. Occasionally, just prior to opening his sales volume of \$115,000,000 in 1923, address, a speaker will release a well and the total sales are expected to be pitched cough, evidently believing over \$300,000,000 in 1924. In another eighty meters, except when the trans-

Every artist of the fair sex is a Miss to us until otherwise instructed. When a young artist blushingly re- Trying to Eliminate quests a Mrs. we immediately lay

ply with even a part of them would help in this work.

tion of the congestion of broadcast ing wave lengths is anticipated by HE police see potential crimental great genius of a vast music opening four new bands of short tem of transmission by short wave smaller aerial combined with a short wave lengths to amateurs.

ties; doctors, malady victims; but osities. And how well you know our thorized all district radio supervisors been appointed president of the Italothe announcer is praying for artists voice! Just ours—when there are to issue general and restricted Radio Company. Senator San Mar-months later, in May, 1923. With his who will divert him as well as you there in Four Corners licenses to amateurs to permit the nerfective out there in Four Corners licenses to amateurs to permit the tino, the former president, while a ted were marvelous, he felt it his who will divert him as well as you before in Four Corners on your little seven-tube set. But listeners and kindle anew in him the on your little seven-tube set. But spark of enthusiasm. Incidentally, for all that we, too, are human and the French system of justice prevails enjoy the crushed apples just as the 4 to 5 meters for CW purposes. At six months' presidency was not cheaper method of radio transmis-

Enfin, why ask us to announce that

tions. Pocketbooks, children and even the short wave lengths from 25 to 300 was formed of French, Italian and dently, the Senator had no friend at lovers must go astray occasionally, meters," said Chief Radio Supervisor German capital, will adopt Senator court or in the ministry, for the gova musty artist. "Cave canem" is One night we were asked to announce Terrell, "we can put more stations Marconi's new system remains to be ernment soon after gave the concesstamped on every request of the folthat a social club with a brand new on them than we can put on the band seen. As both Coltano and San sion to the combined interests of radio receiver would welcome ten 300 to 1500 meters at present. On lowing type: i. e., that we mention lowing type: i. e., that we mention young ladies, there being some ten the wonderful work done by Mme. Jonesome males, as guests. Certainly be two, three and sometimes four economical point of view it is not German Telefunken, who eventually We enjoy a good joke. Sometimes meters apart to prevent interference. likely that they will spend large German Telefunken, who eventually announce and the world laughs at

> conducted by the General Electric mission. The Italo-Radio Company Marconi's right-hand man in Italy Company on the fifteen and sixteen was formed when the Duke di Cesaro explained to me the reason for the meters wave lengths. While these ex- was Minister of Posts and Telegraphs low cost of installing Marconi's new periments were not entirely successful in the first Fascista Cabinet. This system and the very great advantages Radio Industry they showed the possibilities of the contract, made between the company which would accrue to the Italo-Radio short wave lengths.

A survey of the radio industry re-

tears, giggles, lack of originality, ber of radio sets in use will increase owners of amateur stations may con-The survey indicates that the numto the dignified, stiff-shirted statesthis event radio manufacturers would sion, including radiophone work, but pounds of copper annually. Copper is an indispensable metal

the good and the bad of human na- in radio manufacture, either in its ture are reviewed by our alert eyes basic form or in alloys of brass or and are commented upon silently, bronze. The average radio set re-"Lovely work, Miss Lyrico," "Your quires about two pounds of copper in voice was splendid, Mr. Highhat." all forms. It is used as coil windings, "Your selections were so different, antennæ or loops, lead-in wires and Mass Manotony." How they drink it connections, switch points, switches, in, these governors, statesmen, doc- binding posts, terminals and other

how may they know what anguish or carried on by both individuals and

doesn't want to talk to mother, and practically a non-existent status only circuit. pitched cough, evidently believing over \$300,000,000 in 1924. In another that our microphones are trained to two or three years radio sales in the mitting station is so situated as to the office of the Director of Commutations and the New York and the New York

long odds that she will sing of love The Bureau of Standards is at- 105 to 110 meters in addition to the signed to the Public Health Service them in schools, and local organizaand springtime. Then hubby tele- tempting to eliminate the constant wave lengths in the bands authorized two fifteen-minute periods each week tions have installed receiving sets for phones and we catch the words, "You pitch whistle produced by the "beat- for general and restricted amateur for the transmission of popular lecphones and we catter the words, "rou price whistie produced by the beatdid? I'm glad. Yes, for you." To ing" of the carrier waves of two use, where the special amateurs are tures on health topics. Following tion sent out by the Public Health us she says "A friend just said it transmitting stations. When assign- engaged in conducting tests with gov- this arrangement, on December 31, Service. It has been impossible in came over fine." Theoretically the ment of frequencies is made to Class ernment or commercial stations.

1921, the "health-by-radio" service many instances to supply the demand artist knows music, its composers B stations it is with a view that such "General, restricted and special was formally inaugurated. and correct pronunciation. In prac- interferences will not occur. In spite amateur stations will be permitted to "The unique character of this radio tures requested by members of the tice we are better guessers. With of this, the pitch whistle is caused use the entire band of wave lengths service, the first of its kind," says vast radio audience." chinese a dead radio language we can casting stations to maintain the fre
casting stations to and allaying inevitable nervousness, pervisors, assisted by the Bureau of "It should be made clear to the broadcasting stations located in difwe ascertain from those to follow Standards, are doing their best to set amateurs that the authority granted ferent parts of the United States and is the title of a non-partisan talk to their selections, their composers, and keep transmitting stations on above is necessarily tentative, be- Canada applied for the privilege of be broadcast from WOR on Wednestheir selections, their composers, and keep transmitting stations on their own names, life histories, ar- their assigned frequencies, and so cause of the rapid development takrange an orchestra, take balance eliminate this type of interference, tests, keep visitors quiet, answer If radio listeners will identify any questions and incidentally announce. two stations producing beat interference there are forty-seven co-operative thorized may be changed whenever, stations in all, and it is anticipated and during the World War was a Telephone requests also must be an ence and report them to the nearest in the opinion of the Secretary of that others will be added in the near correspondent attached to the French awered, and, apropos of these, to com- supervisor of radio it will greatly Commerce, such a change is neces- future.

### Wave Bands Open To Amateurs

WASHINGTON .- A possible sol radio officials as a result of the action of the Bureau of Navigation in coni's lecture regarding his new sys-simpler installation, by which with a

The Bureau of Navigation has au-

The principal object of the opening man who knows anything about radio, that as the Italian government was of the new bands to amateurs is for his appointment will have a good ef- then discussing the possibilities of

at Aix-les-Bains (no year menwe enjoy a good loss. Sometimes
tioned), or that Senor Lavoce was the
we have to—we are announcers. On the short wave lengths we can put
sums in pulling down the recently their system at Coltano and at San

teurs throughout the country are Telegraphs had already received noti- would mean pulling down the present selection there will be time for cently completed by the Copper and equipped both financially and tech-Brass Research Association discloses nically to experiment with the short his experiments with a new system quite a different shape is used and that, on the basis of an estimated wave lengths, and I have no doubt had been successful. total of 2,500,000 sets in use to-day, that they can devise methods of using them successfully. Reports have coni experts in the laboratory in Engradio apparatus in the United States come to us that many of our amaland had been working along certain in every form, and we grow correhas consumed 5,000,000 pounds of teurs have reached England and other lines to discover a cheaper method of monstar installations as were planted. foreign countries on the band 150 to radio installation. Their experiments monster installations as were planned reached a successful conclusion in

Under the new authorization the January, 1923. tinue to use the band between 150 and 200 meters, employing CW spark Senator Marconi the results of these grees amplitude. The wave used is and modulated forms of transmis- experiments for him to make the final very short-about 100 meters. special amateurs lose the band between 200 and 220 meters, which is "Health by Radio" ments were concluded with the Fornow held in reserve. This class of amateurs, however, is granted a new channel between 105 and 110 meters in addition to the wave lengths be-

tween 150 and 200 meters. Here is the Bureau of Navigation letter to radio supervisors, authoriz- aid at a nominal expense to a great country and abroad, having a poten-

"Effective this date (July 24) you are authorized to issue general and information, according to Surgeon example of their extensive use it may restricted amateur radio station General Hugh S. Cumming, of the be noted that during the month of how may they know what angulsh or carried on by both individuals and pleasure they afforded? Their corporations, of all degrees of importance and output, from the lone individuals and pleasure they afforded? Their corporations, of all degrees of importance and output, from the lone individuals and pleasure they afforded? Their corporations, of all degrees of importance and output, from the lone individuals and pleasure they afforded? Their corporations, of all degrees of importance and output, from the lone individuals and pleasure they afforded? Their corporations, of all degrees of importance and output, from the lone individuals and pleasure they afforded? Their corporations, of all degrees of importance and output, from the lone individuals and pleasure they afforded? Their corporations, of all degrees of importance and output, from the lone individuals and pleasure they afforded? Their corporations, of all degrees of importance and output, from the lone individuals and pleasure they afforded? Their corporations, of all degrees of importance and output, from the lone individuals and pleasure they afforded? Their corporations, of all degrees of importance and output, from the lone individuals and pleasure they afforded? Their corporations are all of the following bands of short many pleasure they afforded? Their corporations are all of the following bands of short many pleasure they afforded? Their corporations are all of the following bands of short many pleasure they afforded? Their corporations are all of the following bands of short many pleasure they afforded? Their corporations are all of the following bands of short many pleasure they afforded? Their corporations are all of the following bands of short many pleasure they afforded the following bands of short many pleasure the pleasure they afforded the following bands of short many pleasure the pleasure that the pleasure the pleasure the pleasure that the pleasure the pleasu way—neither could we. Send them vidual "attic manufacturer" to the away with a smile! We'll need them largest electrical manufacturing corporation. The real radio fan is conmeters, in addition to the band 150 tion of health lectures through the during the same month. tinually making and remaking his set, which is reflected in the proportion which is reflected in the proportion of sales of parts to finished sets. tion, which station must be prepared

placements to finished sets, the home- raphy only will be permitted on wave believed to be the first health mes- lectures average about 1,200 words extra numbers and will use them if important.

and the antenna circuit must not be directly coupled to the transmitting or and the same year Gen-minutes.

operate the chaff from the wheat. But United States will undoubtedly reach produce objectionable interference nications of the Navy Department recome to have a definite place in the

will not use wave lengths above 200 ences, arrangements were made radio is having a very definite effect. meters. They may be authorized to whereby the Director of Communica- School teachers have copied these Carrier-Wave "Beating" use the band of wave lengths from tions of the Navy Department as- broadcasts in shorthand and used

sary."

### Marconi's Short Wave System

Inventor Assumes Presidency of Italo-Radio Company, Which May Adopt His Directive Devices

By AGNES R. MACKENZIE

ROME.—Senator Guglielmo Mar- tests. The system consisted of a was very warmly greeted by all radio sion could be obtained with a minian Italian point of view, the only and Senator Marconi was convinced installed stations, even though event- Paolo, Rome. "Experiments already have been unlly they would save money in trans- A Marconi expert who has been

and the government, was signed even | Company if the older system were re-"Many of the thousands of ama- though the Minister of Posts and placed by the new. Of course it simple wires instead of the grouping which is necessary for the longer wave length. The distance between for the stations of the imperial chain in England. It is possible to send energy in whatever direction the operator wishes, and only in the sense They were able to hand over to desired, by a flash width of 1,200 de-

"Beginning January 1, 1924, the

broadcast schedule was placed on a

#### eign Language Information Service, Lectures Popular whereby that service was furnished with copies of these radio lectures

Marconi's British Experiment

WASHINGTON.—Radio offers an for translation and use in the forunparalleled opportunity to render eign language newspapers in this ing the new wave length bands for mass of people hitherto inaccessible tial field of 25,000,000 readers. These through the broadcasting of health sixteen different languages. As an

was first attempted by the Public mailed from Washington to all coeral Cumming authorized Assistant "The value of this service is well garding Public Health Service broad- air, and plenty of evidence is at hand "Hereafter special amateur stations casts. As a result of these confer- that health information released by

following six months six commercial

army, receiving an important decora "On March 25, 1922, arrange- tion for his extraordinary services

for copies of these radio health lec-

# The Herald Tribune Daily Broadcasting Programs for Week Ending August 9

#### TO-DAY

\*WEAF—NEW YORK CITY—492

3-4 p. m.—Interdenominational services, auspices Greater New York Federation of Churches. Music by the Federation Radio Choir—Marion Holt Brown, so prane; Carlos Abba, harpist; George Vause, pianist, and Arthur Billings Hunt, barytone. Address by Rev. Isaac Ward, D. D.

5 p. m.—The Prophet of Comfort and Hope." Prof. Herbert B. Howe.

7:20-9:15 p. m.—Musical program from Capitol Theater. The first part will consist of music by featured artists and sist of music by featured artists and presentation by Mr. Rothafel of vocal and instrumental artists.

8:15-10:15 p. m.—Organ recital.

\*WJZ—NEW YORK CITY—455 \*WEAF\_NEW YORK CITY\_492

\*\*WJZ\_NEW YORK CHTY\_455

11 a. m.—West End Presbyterian Church services; Rev. Charles L. Goodell.
2:30 p. m.—Radio Bible Class, Dr. D. K. Apelian, pastor; Church Community Chorus; Honarine Furgerson, soprano, soloist; Pafton Kent, soloist.
2:30 p. m.—Mario Calati, cellist.
3:30 p. m.—Lucille Jones, soprano; Cectil Needham, tenor.
7 p. m.—Vathan Abas' Orchestra.
8 p. m.—Wathor Ment, soloist.
9 p. m.—Radio Entertainers.
11 a. m.—West End Presbyterian Church sorvices; Rev. Charles L. Goodell.
2:30 p. m.—Mario Calati, cellist.
3:30 p. m.—Mario Calati, cellist.
4:30 p. m.—Lucille Jones, soprano; Cectil Needham, tenor.
7 p. m.—Nathan Abas' Orchestra.
8 p. m.—Talk for Business Men.
8:20 p. m.—New York Philharmonic Orchestra.
2 p. m.—Concert Cuty—Adage

11 p. m.—Concert Cuty—Adage

2 p. m.—Concert Cuty—Adage

2 p. m.—Concert Cuty—Adage

3 p. m.—Goodell.
3 p. m.—Goodell.
4 p. m.—Luchehon Orchestra.
5 p. m.—Concert Cuty—Adage

4 p. m.—Chat with Children.
4 p. m.—Elaine Prince, soprano.
5 p. m.—Radio Bible Class, Dr. D. K.
5 p. m.—Radio Bible Class, Dr. D. K.
5 p. m.—Radio Bible Chestra.
5 p. m.—Talk and orchestra.
6 p. m.—Radio Bible Chestra.
7 p. m.—Natharhyne Behnke, contralto.
4 p. m.—Elaine Prince, soprano.
4 p. m.—Elain

9:15 p. m.—Concert Band of the Aquitania.
\*WFBH—NEW YORK CITY—273

\*WFBH—New York services, Rev. W. 9:15 p. m.—Concert Band of the Adultanta ings.

\*WFBH—NEW YORK CITY—273

9:11 a. m.—Church services, Rev. W. 5 p. m.—Hoy Scout program.

5 p. m.—Kiddies' period.

5 p. m.—Kiddies' period.

5:15 p. m.—Travelogue, Edourd Panchard.

5:30 p. m.—Ida Fehleisen and Anna Ded-\*WBRR-STATEN ISLAND, N. Y.-273

Rutherford. 9:50 p. m.—Choral singing. \*WHN-NEW YORK CITY-360 10-11 p. m .- Paul Specht's Orchestra. \*WBS-NEWARK-360 1 p. m.—Robert J. Laird, classical music. 1:30-2 p. m.—Florence Darby, soprano; Lu .cille Cooke.

2-3 p. m.—Sterling Dance Orchestra.

WFI—PHILADELPHIA—395

2:45 p. m.—Services of the Arch & Presbyterian Church.
\*WIP—PHILADELPHIA—509

\*WGR-BUFFALO-319 3 p. m.—Vesper services. 11:45 p. m.—Weather forecast. \*WGY-SCHENECTADY, N. Y.-380 10:30 a. m.—Church service. 8:30 p. m.—Concert by New York Philhan monic Orchestra. \*WMAF-S. DARTMOUTH, MASS.-363 7:20 p. m.—Introductory remarks, Joseph Plunkett.
7:25 p. m.—Musical program from Mark Strand Theater.
8:20 to 10 p. m.—Special program by vocal and instrumental artists.
\*WGI—MEDFORD, MASS.—360

p. m.—'Adventure Hour.' Musicale.

8 p.

•WTAT—BOSTON—244 p. m.—Special orchestra \*WNAC-BOSTON-278 11 a. m.—Entire church service. 3:30 p. m.—Band concert. 6:45 p. m.—Entire church service. \*WBZ—SPRINGFIELD. MASS.—337 8:15 p. m.—Atists concert.
9:30 p. m.—Recital by Beatrice Swans soprano; Leland Merrihew, tenor.
\*WJAR—PROVIDENCE—360

7:20 to 9:15 p. m.—Musical program the Capitol Theater though WEAF. 9:15 to 10:15 p. m.—Organ recital. \*WKBF—PROVIDENCE—286 10 to 11:15 p. m.—Organ recital; s \*KDKA—PITTSBURGH—326 p. m.—Concert.
p. m.—Dinner concert.
p. m.—Badio Chapel service.
\*WCAE—PITTSBURGH—462
p. m.—People's Radio church s

WCAP-WASHINGTON-469 11 a. m.—Services. 4 p. m.—Open air services. 5:20-8:15 p. m.—Musical program from Capitol Theater. Capitol Theater. 8:15-9:15-p. m.—Organ recital. WHAS—LOUISVILLE, KY.—400

10:57 a. m.—Organ music; church se 5-6 p. m.—Sacred concert. WSB—ATLANTA—429 6 p. m.—Methodist church service. \$:30 p. m.—Westey church service. WQAM—MIAMI, FLA—283 8 p. m.—Musical talent from churches. WEAP—MOBILE, ALA.—300 a p. m.—Vesper services 12 midnight—Musical concert. WLW—CINCINNATI—423 WLW—CINCINNATI—423 by the West

Southern Orchestra.

WWJ—DETROIT—517 WCX-DETROIT-517 m.—Dinner concert.
p. m.—Church services; quartets.
WHAA—IOWA CITY—181

WHAA—AUG p. m.—Familiar hymns. WOC—DAVENPORT—484 2:30 p. m.—Orchestra concert (1 hour), p. m.—Church service. 10:30 p. m.—Musical program.
WHO—DES MOINES, 10WA—526 8 p. m.—Speeches and musicale 8:30 p. m.—Musicales, WMAY—ST. LOUIS—280

b p. m.—Newman Theater program.
WLS—CHICAGO—345
6:30 to 8 p. m.—Church Athletic A WEBH—CHICAGO—370

KYW-CHICAGO-536 11 a. m.—Sunday morning church 2:30 p. m.—Studio chapel service. WDAP—CHICAGO—360 6 p. m.—Organ recital. 10:16 p. m.—Concert by Drake

wQJ—CHICAGO—448 \$ to 10 p. m.—Arist series program.

WOAW—OMAHA—526

Woaws series service. 10 a. m.—Radio chapel service.
10 p. m.—Musical chapel service.
WFAA—DALLAS—476 8:45 p. m.

7 p. m.—Scores; dinner concert.
7:30 p. m.—Children's period.
9 p. m.—Male quartet.
\*WCAE—PITTSBURGH—462
9:30 p. m.—Musical program.
11 p. m.—Late concert.
WEC—WASHINGTON—469 12 midnight—Popular program. MONDAY 3:35 p. m.—Piano recital. 50 p. m.—Talk, Mrs. Du Puy.

\*WEAF-NEW YORK CITY-492
p. m.—Dorothy B. Woersching,
prano, accompanied by Florence L
Palmer. p. M.—Helen Ryan, violinist. 4:30 p. m.—Women's program.

p. m.—Waldorf-Astoria dinner music

7:30 p. m.—Luise Fraer, soprano.

7:45 p. m.—Josephine Emerson, violinist.

8:10 p. m.—Luise Fraer, soprano.

8:20 p. m.—Josephine Emerson, violinist.

8:20 p. m.—Concert by U. S. Marine

Band.

\*WJZ-NEW YORK CITY-455 Lt-Nathan Abas's Orchestra. m.-Eleanor Gunn's fashion talk, p. m.-Daily menu. p. m.-Edna May Fay, soprano.

145 p. m.—Fred Hall's Orche 130 p. m.—Market reports. p. m.—Gotham Orchestra. 120 p. m.—Financial developm

\*WBRR STATEN 9:10 p. m.—Choral singing. 9:25 p. m.—Bible lecture by Judge J. F. 6:15 p. m.—Hotel orchestra. 9:25 p. m.—Bible lecture by Judge J. F. 6:30 p. m.—Jack Delaney, humorist. Rutherford. 6:40 p. m.—Orchestra selections. \*WBBR-STATEN ISLAND, N. Y.-273 p. m.—Fred Franz, tenor. :15 p. m.—World news digest. :45 p. m.—Fred Franz.

\*WOR-NEWARK-405 tone.
2:45 p. m.—George Perry, tenor, and Rus
sell Blumstein, pianist.
3 p. m.—A talk on "Reducing."
3:15 p. m.—Talk by Janet Lewis.
3:25 p. m.—Catherine Murphy, theate star. 35 p. m.—James Knox Wallace,

chestra.
7:30 p. m.—Evening service.
7:30 p. m.—Sunday evening concert from
Atlantic City.

3:45 p. m.—George Perry, tenor; Ru:
Blumstein, planist.
Blumstein, planist. Blumstein pianist.
6:15 p. m.—Elite Orchestra.
7:15 p. m.—Resume of day's sports.
8 p. m.—Talk by Ray C. Strang.
8:15 p. m.—Newark Philharmonic Co 5 p. m.—Dr. Sigmund Spaeth,

> 0:30 p. m.—Program by the WOR Monday Nighters. \*WBS\_NEWARK-360 to 2:15 p. m.—Pance music.
>
> \*WAAM—NEWARK—26: 11 a. m.—Piano recitat; health broader 11.30 a. m.—Amateur news. 8 p. m.—Ronald A. Sauer's Orchestra. 9 p. m.—Essex Troop Night. 10 p. m.—Ben Friedman, tenor.

noon—Luncheon music.
45 p. m.—Grand organ; trumpet
30 p. m.—Sports results; police dinner music,
30 p. m.—The Sylvan Quartet,
10 p. m.—Theater orchestra.
) p. m.—Organ recital,
0:30 p. m.—Candelori's Dance Orche
1:00 p. m.—Dance program.

\*\*WFI—PHILADELPHIA—395 m.—Orchestra. m.—Duets and solos. A me

men. m.—Meyer Davis's Orchestra ts results.
\*WIP—PHILADELPHIA—509 tions.
p. m.—"What Wild Waves Say."
05 p. m.—Visiting artists; chats.
30 p. m.—Comfort's Philharmoi

chestra. 05 p. m.—Frisco Serenaders. p. ni.—Bedtime stories. \*WDAR—PHILADELPHIA—395

tra.
3 p. m.—Arcadia Orchestra; music.
30 p. m.—Mrs. Louis Love, "Reducing,"
45 p. m.—Baseball scores.
30 p. m.—Dream Daddy.
50 p. m.—'Movie' review, James Nassau.
p. m.—Concert orchestra.
30 p. m.—Artist recital.
30 p. m.—Artist recital.
50 p. m.—Theater features; dance orchestra; artists.

p. m.—Concert orchestra. \*WGY—SCHENECTADY, N. Y.—380 :15 p. m.—Review of week's sports. :45 p. m.—Musical program. \*WGR—BUFFALO—319

12:30 p. m.—Organ recital. 6:30 p. m.—Vincent Lopez's Orchestra. 9:10 p. m.—Seven musical numbers. -Ten musical sele 10 to 11 p. m.—Ten musical selections.

12 p. m.—Vincent Lopez's Orchestra.

\*WHAZ—TROY, N. Y.—380

10 p. m.—Imperial Dance Orchestra, Wil-li p. m.—Judith Roth's Entertainers ing soloists; "Right Thinking," by Mrs.

\*WBS—NEWARK—360

\*WMAF-S. DARTMOUTH, MASS-363 5 p. m.—Dinner music.
:30-8:30 p. m.—Louise Fraer, soprano;
Josephine Emerson, violinist.
3:30-10 p. m.—Concert by U. S. Marine
Band.

\*WNAC—BOSTON—278

\*WOR—NEWARK—405
2:30 p. m.—Anna Rose, soprano.
2:30 p. m.—Milliam Oscar, violinist.

\*WOR—NEWARK—405
2:46 p. m.—William Oscar, violinist.

wNAC—BOSTON—278
p. m.—Colonial Orchestra,
p. m.—Colonial Orchestra,
p. m.—Children's half hour.
p. m.—WNAC dinner dance.
p. m.—To be announced.
wBBZ—SPRINGFTELD, MASS.—337

\*WBZ-SPRINGFIELD, MASS.—337
6 p. m.—Dinner concert.
7:30 p. m.—Eedtime story.
7:40 p. m.—Concert by WBZ Trio.
9:30 p. m.—Florence L. Clark, contralto.
10 p. m.—Recital by James A. Watts.
\*WJAR-PROVIDENCE—360
10 a. m.—Housewives Radio Exchange.
10:45 a. m.—Miss Marle Koester, "Style of To-day."
1:05 p. m.—Miscellaneous program.
8 p. m.—Baseball scores.
8:05 p. m.—Charles H. Wagner, singing.
\*KDKA—PITTSBURGH—326
12:15 p. m.—Scalzo's Orchestra.

m .- Scores; dinner concert.

Code.

p. m.—Stories for children.

WCAP—WASHINGTON—469

7:30 to 9 p. m.—Concert by United States
Marine Band.

p. m.—Talk by Frederick J. Haskin.

5:45 p. m.—Second act of Gilbert and Sulop. m.—Second act of Gilbert and van's opera, "Iolanthe."

WHAS—LOUISVILLE, KY.—400

o 9 p. m.—Band music. WLW—CINCINNATI—423 -Grand opera concert. WSAI-CINCINNATI-309

10 p. m.—Jack Keefer's Orchestra WWJ—DETROIT—517 m.—Schmeman's Concert Band. WOC—DAVENPORT—484 who-des moines, iowa-526

pr-[11 p. m.—Musical program.
12 p. m.—Orchestra selections.
WCX—DETROIT—517
a 6 p. m.—Dinner concert.
8:30 p. m. p. m.—Musical program. WOS—JEFFERSON CITY—441 m.—Talks.
p. m.—State Prison band conce KYW-CHICAGO-536

WMAQ—CHICAGO—448

-Theater organ recital.

n.—LaSalle Orchestra. WOAW-OMAHA-526 WGAZ-SOUTH BEND IND .- 360

KFKX—HASTINGS, NEB.—286 WFAA-DALLAS-476

\*CKAC-MONTREAL-425 p. m.—Weather; stocks.

#### TUESDAY

\*WEAF-NEW YORK CITY-492 1:50 a. m.-Market and weather reports

11:50 a. m.—Market and weather reports.
i. p. m.—Al Friedman's Orchestra.
4:40 p. m.—Stories for children, Miss Marjorie L. Cowles.
6 p. m.—Waldorf. Astoria dinner music.
7:30 p. m.—Pavilion Royal Orchestra,
8:30 p. m.—Talk.
8:40 p. m.—Gordon Male Quartet.
9 p. m.—Rita Rotermel, planist.
9:15 p. m.—Rita Rotermel, planist.
9:45 p. m.—Rith Rotermel, planist.
\*WJZ—NEW YORK CITY—455
1 p. m.—Ambassador Trio. bary- 1 p. m.—Ambassador Trio.

- Deleanor Gunn's Fashion Talk. -'Home Beautiful," Doroth

n.—Dr. Sigmund Spaeth, "The on Sense of Music."

m.—"Japanese Plays," Michio on Michio on Michio on Sense of Music."

m.—"Japanese Plays," Michio on Michio

10:45 p. m.—Roger Wolfe's Orchestra \*WJY—NEW YORK CITY—405 oing," Professor Binder,

"The Heart of the Office." Geofp. m.—"The frey Childs.

\*WEBJ—NEW YORK CITY—273 p. m.—Blybrun, "Motion Pictures."

10 p. m.—Plano solo, Arthur Shattuck.

15 p. m.—Talk, Frieda Iniscort.

25 p. m.—Frank Bannister, singing.

25 p. m.—Werves," Dr. Dorothy Bocker.

45 p. m.—May Savage, soprano; Savag

\*WFBH—NEW YORK CITY—273 . m.—Society of Radio Entertainer 0 a. m.—Florence Holland, soprano

p. m.—Song contest.
 p. m.—Frank Herel, violinist.

Mrs. Bob Schaffer, Flank Diebnen, chestra selections; Radio Entertainers \*\*WHN-NEW YORK CITY-360\*\*
10-11 a. m.—"Woman's Hour."
2-3:15 p. m.—Overture and vaudeville.
3:45 p. m.—Irving Miller, barytone.

3:45 p. m.—Jverture and vaudeville.
4 p. m.—Boys' period, William J. Stuart.
4:15 p. m.—Helen Bloom, soprano.
4:30 p. m.—Loretto C. Lynch.
5 p. m.—St. Louis Rhythm Kings.
6:30-7:30 p. m.—Olcott Vail's Trio; Pau
Specht's Danco Orchestra.
9:30 p. m.—Palisades Park Orchestra.
10 p. m.—Bertram J. Goodman's Orchestra.
10 p. m.—Bertram J. Goodman's Orchestra.

7:50 p. m.—Jimmy Moore, Al Lang. 8 p. m.—Violet Russell, planist. 8:20 p. m.—Bob Schaeffer, James Brenns

e \*WOR-NEWARK-405
2:30 p. m.—Anna Rose, soprano.
2:46 p. m.—William Oscar violinist.
3 p. m.—Regina Wallace, theater star.
3:25 p. m.—Anna Rose, soprano.
3:45 p. m.—William Oscar, violinist.
6:15 p. m.—Halsey Miller's Orchestra.
6:30 p. m.—Stories for children.
7 p. m.—Halsey Miller's Orchestra.
7:20 p. m.—Resume of day's sports.

 m.—Resume of day's sports
 WAAM—NEWARK—263 1 a. m.—Plano recital. 1:10 a. m.—Ada Bessie Swan, radio cook-1:10 a. m.—Ada Bessie Swan, radio cooking school.

1:30 a. m.—Florence Doobner, soprano.

2 m.—Agriagrams.

30 p. m.—Lillian Spitzer, pianist.

1:15 p. m.—Sterling Melody Boys.

1:15 p. m.—Jimmy Shearer.

10 p. m.—Mrs. Bob Schaefer and Bob Schaefer.

10:30 p. m.—Jimmy Shearer's concluding feature. feature. \*400—PHILADELPHIA—509

:45 p. m.—Grand organ, trumpets. :30 p. m.—Sports results, police reports WFI—PHILADELPHIA—395 Writer Hiladella Hilagorous 30 p. m.—Meyer Davis's Orchestra Sports results. p. m.—Fairmount Park Symphony Or p. m.—Fairmount Park Symphony chestra. •WIP—PHILADELPHIA—509

tions.

1 p. m.—Organ recital.

1 p. m.—'What Wild Waves Say."

1:05 p. m.—Visiting artists; chats.

1:30 p. m.—Comfort's Philharmonic Organization. :05 p. m.—Ehrenzeller's Concert Orche m.—Bedtime stories.
m.—Comfort's Philharmonic Orch tra.

8:45 p. m.—"What Wild Waves Say."

8:50 p. m.—Vessella's Concert Band.

10 p. m.—Bob Leman's Dance Orchestra.

\*WDAR—PHILADELPHIA—396

2 to 3 p. m.—Concert orchestra.

4:30 p. m.—Artist recital.

5 p. m.—Rducational talks.

12:30 p. m.—Organ recital. 6:30 p. m.—Vincent Lopez's Orchestra. 7:30 p. m.—News; scores. \* Means Daylight Saving Time \*WGY-SCHENECTADY, N. Y.-380 p. m.—Music, opera.
p. m.—Dinner music.
45 p. m.—Musical program.
1:15 p. m.—Organ recital.

All Other Programs Are in Eastern Standard Time

n.—Leo Reisman ensemble.
n.—Leo Reisman Orchestra.
n. m.—Bedtime story. day.

30 p. m.—Cafe ensemble.
p. m.—'Lessons from Greek History,''
Professor Kraemer.

15 p. m.—Goldman Band, concert from
Mall, Central Fark; English program;
Miriam Fine, soprano.
0 p. m.—Sport talk by Fred Fletcher.

0:30 p. m.—Billy Wynne's Inn Orchestra. p. m.-Joseph Eccleston, barytone

\*WJAR-PROVIDENCE-360 \*WNAC-BOSTON-278 6:30 p. m.-WNAC dinner dance. 8:10 p. m.-Boston American Orchestra. \*WKEF-PROVIDENCE-360 10:30 p. m.-Paul Whiteman's

\*KDKA—PITTSBURGH—326 . m.—Scores; dinner concert.

0 p. m.—The Children's Period.

5 p. m.—Talk by Dr. S. H. William

1 p. m.—Concert by KDKA Symphony

\*WGR-BUFFALO-319

\*WMAF-S. DARTMOUTH, MASS,-362

m.—Musicale.
\*WBZ—SPRINGFIELD. MASS.—337

p. m.—Dinner music.

1.40 p. m.—Pavilion Royal Orchestra.

1.40 p. m.—Gordon Male quartet.

1.40 p. m.—Rita Rotermel, pianist.

1.41 p. m.—Gordon Male Quartet.

1.42 p. m.—Rita Rotermel, pianist.

1.43 p. m.—Rita Rotermel, pianist.

1.40 p. m.—MEDFORD, MASS.—360

1.30 n. m.—Mayket reports.

p. m.—Concert. \*WCAE—PITTSBURGH—462 ':30 p. m.—Uncle Kaybee; baseball score
1:30 p. m.—Musical program.
WHAS—LOUISVILLE, KY.—400
1 p. m.—Dick Quinlan's Orchestra.
1:30 to 10 p. m.—Zur Schmede's Harmon

stein's Trio. WSAI—CINCINNATI—309

m.-Musical program. WLW-CINCINNATI-423 m.—Dance orchestra, WJAX—CLEVELAND—390

nith's Orchestra.

WWJ-DETROIT-517 -Schmeman's Concert Band. WCX-DETROIT-517 -Red Apple Club. S-JEFFERSON CITY-441 m.—Band concert; address WOC—DAVENPORT—484

. m.—Chimes concert. WHAA—10WA CITY—484 WDAF-KANSAS CITY-411

n.-Nighthawk Frolic. KYW-CHICAGO-526 p. m.—Dinner concert by Joska Babary's and Paul Whiteman's (gians. p. m.—Musical program. 20 p. m.—Speeches. 45 p. m.—Continuation of musical

0-11:30 p. m.—"At Home" program.

WMAQ—CHICAGO—448

:30 p. m.—LaSalle Orchestra. be announced.
WEBH-CHICAGO-370 7:30 p. m.—Piano and soprano solos; concert selections.
9:30 p. m.—Cello solos; dance orchestra.
11:30 p. m.—Vocal selections; dance or-

WLS-CHICAGO-345 3:30-10 p. m.—Music; lullaby time; farm er and taxes; Legume talks; Scote music; theatrical starts. WDAP—CHICAGO—369

p. m.—Organ concert.

1 p. m.—Chapman's Dance Orchestra.

WQJ—CHICAGO—448

0 a. m.—2 p. m.—Ralph Williams's woaw\_omara\_526 p. m.—To be anounced. KFAF—DENVER—278

p. m.—Evening musical program WGAZ—SOUTH BEND, IND.— KEKX—HASTINGS, NEB.—286 . m.—Midnight concert.
\*KCAC—MONTREAL—425

WEDNESDAY

\*WEAF-NEW YORK CITY-492 a. m.—"Young Mother's Program, talks by Mrs. H. R. Miller and Mar :50 a. m.—Market and weather reports. p. m.—Brun Brothers Orchestra p. m.—Brun Brothers Orchestra. 45 p. m.—Howard Bradford, soprano, ac companied by Winifred T. Barr. 

50 p. m.—Talk.

p. m.—Ray Cropper tenor.

1:30 p. m.—Harry Jentes, planist.

7:30 p. m.—Harry Jentes, planist.

7:30 p. m.—Harry Jentes, planist.

7:30 p. m.—Wall Ramon, soprano; Charles Bryden, tenor.

8 p. m.—Sunce Charles Bryden, tenor.

9 p. m.—Evan Davies, impersonator.

9:16 p. m.—Coane Sugar," by George A.

8:20 p. m.—Joint recital; Hilda Ramon, soprano; Charles Bryden, tenor.

9 p. m.—Evan Davies, impersonator.

9:16 p. m.—Coane Sugar," by George A.

8 p. m.—Sunce Companied by Irene Arduin.

8 p. m.—Nature's Rogues' Gallery," by W. L. Wright.

8:10 p. m.—Jack Kimberly, barytone.

8:20 p. m.—Jack Kimberly, barytone.

8:30 p. m.—Weaf Country Club Group.

10 to 11 p. m.—Weaf Country Club Group.

10 to 11 p. m.—Vincent Lopez's Orchestra.

m.—Trio, Astor Roof Garden.
m.—Eleanor Gunn's Fashion Talk.
p. m.—Daily menu.
p. m.—Talk by John C. Cutting.

tion." .: Market reports.

\*WFBH—NEW YORK CITY—273
a. m.—Society of Radio Entertaine 1 a. m.—Society of Radio Entertainers. 2 noon—Luncheon orchestra music. p. m.—Bob Schafer, Jim Brennan, Mrs. Bob Schafer, original Chicago Five. p. m.—Soprano solos, Marion Callan. 30 p. m.—Jeanette Sheldon, elocutionist.

p. m.—Piano recital. 30 p. m.—Jack Niles and Mildren Gard-

ner.
p. m.—Kiddtes' period.
15 p. m.—Rita Melvin, soprano.
15 p. m.—Panchard Orchestra.
p. m.—Radio singing.
15 p. m.—Panchard Inn Orchestra.
145 p. m.—Hotel orchestra.
130 p. m.—Dr. Eugene Christian, health

WBBR-STATEN ISLAND, N. V.-273 5 p. m.-F. Wood

\*WHN-NEW YORK CITY-360 blues.

136 p. ni.—Harry Hock's entertainers.

145 p. mi.—Original Louisiana Five.

145 p. ni.—Roy Smeck, string wizard.

p. mi.—Joint recital by Madeline Grc

Mary Hunter.

1:30 p. m.—Vincent Lane, Irish tenor.

1:45 p. m.—Vincent Adams, "Tolerance."

5 p. m.—Ross Fowler, barytone.

6:30-7:30 p. m.—Olcott Vail's Trio; Paul Specht's Dance Orchestra.

7:30 p. m.—Billy Page's Syncopators.

8 p. m.—Period for shut-ins.

8 p. m.—Period for Shut-ins. p. m.-Henny Cogert and Chas. Hirst

singing. 9:16 p. m.—Palisades Park Orchestra. 9:45 p. m.—Boy's period, Wm. J. Stuart. 10-11 p. m.—Clover Gardens Orchestra. \*WBS-NEWARK-360 1 a. m.—Dance music. -2:15 p. m.—Piano recital.

\*WOR-NEWARK-405 n.-"Henrik Ibsen," John Taylo Romiser.
2:45 p. m.—Marion Breidenthal, soprano.
3 p. m.—Plano solos, Louise Egner.
3:15 p. m.—Chrystal Herne, theater star.
3:30 p. m.—Michael De Santis, harpist.
3:45 p. m.—Marion Breidenthal, soprano.
6:15 p. m.—Baudistel's Orchestra.
6:55 p. m.—Resume of day's sports,
8:30 p. m.—Gene Ingraham's Orchestra.
8:30 p. m.—Concert by Cantor Chagy
8:45 p. m.—"Presidential Campaign Novelties," Edward S. Van Zile.
8:15 p. m.—Concert by Cantor Berele Chagy,

\*WAAM-NEWARK-263 pianist.
p. m.—Ben Friedman, tenor.
45 p. m.—Twentieth Century Sextet.
45 p. m.—Judith Roth. o:15 p. m.—Al Wilson.

Herman Engler, songs

\*WOO—PHILADELPHIA—509
a. m.—Organ recital:
m.—Luncheon music. 5 p. m.—Grand organ; trumpets.
0—Sports results, police reports, din

music.
8:30 p. m.—Concert from Houston Hall.
9:30 p. m.—Organ recital.
2WFI—PHILADELPHIA—395 p. m.—Trumpet solos and duets b Catherine Houser, Mabel Ewer, Mari Nelson, Ammon Beckheiser, Carolin Hoffman; musical talk by Mabel Swin Ewer. 6:30 p. m.—Meyer Davis's Orchestra. \*WIP—PHILADELPHIA—509

0 a. m.—Seashore gossip; health talk. p. m.—"What Wild Waves Say." :05 p. m.—Visiting artists' chats. :30 p. m.—Comfort's Philharmonic Orchestra.
p. m.—Bob Leman's Dance Orchestra.
05 p. m.—Eddie Elkins' Orchestra. \*WDAR—PHILADELPHIAA—395

p. m.—Concert orchestra; talk.
m.—Artist recital; scores.
m.—Dream Daddy.
m.—Arnold Abbott; concert music \*WCR-BUFFALO-319 \*WCR-BUFFALO-319
12:30 p. m.—Organ recital.
6:30 p. m.—Wincent Lopez's orchestra,
9-10 p. m.—Musical program.
10 p. m.—Wiola Cornell, soprano.
11 p. m.—Vincent Lopez's orchestra. \*WMAF-S. DARTMOUTH, MASS,-363

WGY-SCHENECTADY, N. Y.-380 \*WGI-MEDFORD, MASS.—360 45 p. m.—Talk; popular song hits. \*WBZ—SPRINGFIELD, MASS.—337

m.—Bedtime story,
m.—WBZ Trio p. m.—William Howell, barytone.

30 p. m.—Copley-Plaza Dance Orchest
130 p. m.—Leo Reisman's Orchestra.

2 p. m.—Songs by Bill Coty and F

n.—Colonial Orchestra.
m.—Colonial Orchestra.
m.—Chiidren's half hour.
m.—WNAC dinner dance.
..—To be announced. \*WJAR—PROVIDENCE—360 m.—Housewives' Radio Exchange a. m.—Marie C. Koester, "Styles

:30 p. m.-Gertrude H. Bronenkent. prano.
7:50 p. m.—Roy Cropper, tenor.
8:10 p. m.—Ramos Family Orchestra.
8:30 p. m.—Gertrude H. Bronenkent,

prano.

8:50 p. m.—Ramos Family Orchestra.

9 p. m.—"True Tales of the Secret Service," Major C. E. Russell.

9:15 p. m.—Talk by George A. Zabriskee.

9:25 p. m.—Ramos Family Orchestra.

\*KDKA-PITTSBURGH-326
12:16 p. m.—Daugherty's Orchestra.
6 p. m.—Baseball scores. \*WCAE\_PITTSRURGH\_462

WRC---WASHINGTON--469 —Song recital,

m.—Season's sports for women,

m.—Instruction for internation

m.—Stories for children. WCAP-WASHINGTOX-469 to 8 p. m.—Outdoor concert United tates Marine Band.
. m.—"True Tales of the Secret Servie," by Major C. E. Russell.
ip. m.—United States Army Band con--"Science News of the Week."

WHAS-LOUISVILLE-400 WLW-CINCINNATI-423

---Concert by trio.
WCX---DETROIT---517 m.—Musical program.
WW.J—DETROIT—517 n.—Orchestra selections.
b. m.—Schmeman's Concert Band.
WOC—DAVENPORT—484 p. m.—Organ recital. WOS—JEFFERSON CITY—441

. m.—Musical program; barn dan WDAF—KANSAS CITY—411 p. m.—Artist's program.
WHO—DES MOINES, 10WA—526 12 midnight—Musical program.

KYW—CHICAGO—536

#YW—CHICAGO—536

3:45 p. m.—Children's bedtime story.
7 p. m.—Dinner concert by Joska De Babary's and Paul Whiteman's orchestras.
7:30 p. m.—Studio program.
9 p. m.—Musical program.
9:45 to 12:30 p. m.—Midnight revue.

WMAQ—CHICAGO—448 —Organ recital.

m.—Stories for children.

m.—Carl Craven, tenor.

WEBH—CHICAGO—370

m.—Tenor and orchestra selectio m.—Violin and dance numbers. p. m.—Guitar duets, songs; dar KFHX-HASTINGS, NEB.-286 p. m.—Dinner concert. WGAZ—SOUTH BEND, IND.—369 to 10 p. m.—Big Five orchestra. KFMX—NORTHFIELD, MINN.—233 p. m.—Organ recital. KGW—PORTLAND, ORE.—492 KPO—SAN FRANCISCO—423

#### THURSDAY

10 p. m.—Rudy Seiger's orchestra.
11 p. m.—Max Bradfield's Band.
\*\*CKAC-MONTREAL—425
4 p. m.—Weather, news.

\*WEAF-NEW YORK CITY-492 a. m.—Musical program; talk Ada B. Vail.

11:20 a. m.—Musical program; talk by Mrs.

Ada B. Vail.

11:50 a. m.—Talk by Sarah Curtis.

11:50 a. m.—Market and weather reports.

4 p. m.—Hotel orchestra.

4::40 p. m.—Stories for Children.

6 p. m.—Waldorf-Astoria dinner music.

7 p. m.—Mid-week services.

7:30 p. m.—Maximlian Mitnitzky, composer-planist.

7:46 p. m.—Jack Kimberly, barytone, accompanied by Irene Arduin.

8 p. m.—'Nature's Rogues' Gallery," by W. L. Wright.

8:20—"Business Conditions in Germany,"

Dudley F. Fowler.

5:30 p. n.—Weaff County Club. \*WJZ-NEW YORK CITY-455
p. m.—Nathan Abas's Orchestra.
p. m.—Eleanor Gunn's Fashion Talk.
110 p. m.—Daily menu.
115 p. m.—"The Progress of the World."
120 p. m.—Mark t reports.
p. m.—Concert orchestra.
120 p. m.—Financial Developments of the Day.

Day, 30 p. m.—Concert orchestra, 8 p. m.—Voncert orchestra.
8 p. m.—Weekly French Lesson.
8 30 p. m.—Estey Organ Recital.
9 15 p. m.—United States Army Night,
Major General Robert Lee Bullard,
speaker; music by United States Army
Band.
10:30 p. m.—Waldorf-Astoria Dance Orchestra.

\*WJY-NEW YORK CITY-405 "WJY--NEW YORK CTIY--30 3:15 p. m.--"Side Lights on Mark T Professor Driggs. 3:45 p. m.--Talk. 9 p. m.--Al Reiser's Orchestra. 10 p. m.--Talk by Mrs. Lee Thoyer.

\*WFBH-NEW YORK CITY-273

2 p. m.—Piano recital; talk.
2 30 p. m.—Orchestra.
3 30 p. m.—Orchestra.
3 30 p. m.—Readings.
4 p. m.—Norma Watson, soprano.
4 30 p. m.—Violin recital.
5 p. m.—Kiddies' period.
5 p. m.—Edolores Royola, soprano.
5 p. m.—Delores Royola, soprano.
5 p. m.—Fernando Villa, tenor.
5 p. m.—Fernando Villa, tenor.
5 p. m.—Hotel orchestra.
5 p. m.—Hotel orchestra.
7 p. m.—Hotel orchestra.
7 p. m.—Orchestra selections.
1 30 p. m.—Midnight rendezvous; Jimmie Clarke entertainers.

WHN-NEW YORK CITY-360 0-11 a. m.—"Woman's hour." :15-3:15 p. m.—Bob Schaefer's entertain ers; Chicago Five, Mrs. Bob Schaefer. :45 p. m.—Boy's period, Wm. J. Stuart. p. m.—Eleanor Gerlach, soprano. 4 p. m.—Eleanor Gerlach, soprano.
4.15 p. m.—Musical program.
4.45 p. m.—Loretto C. Lynch.
5 p. m.—Leonard Partridge's orchestra.
6.30-7:30 p. m.—Olcott Vall's trio; F
Specht's dance orchestra.
9.30 p. m.—Palisades Park orchestra.
10 p. m.—Baseball statistics.
10:05 p. m.—Vincent Lane, Irish tenor.
10:15 p. m.—Sara V. Turits, soprano.
10:30 p. m.—Rogsland dance orchestra.

\*WBBR-STATEN ISLAND, N. Y.-273 :10 p. m.—I. B. S. A. Hawaiiar :25 p. m.—Int. Sunday School I August 10. 9:45 p. m.—I. B. S. A. Hawaiian Qua \*WBS-NEWARK-360

\*WAAM-NEWARK-263 "WAAM—NEWARK—263
11 a. m.—Piano recital; cooking school.
11:30 a. m.—Florence Doebner, soprano.
12:00 m.—Agriograms.
1:30 p. m.—Orchestra selections.
1:30 p. m.—James Vincent Moore's Ent

WLS—CHICAGO—345 :30 to 12 p. r 7.30 p. m.—James vincent Moore's Entertainers.
8:00 p. m.—Talk, Walter Storey.
8:15 p. m.—Mile, A. van den Brandeler, operatic selections.
8:45 p. m.—Harry Knox's Entertainers.
10:00 p. m.—Catello's Radio Bentertainers.
2:30 p. m.—Soprano solos, Hazel Dudley.
2:45 p. m.—Mrs. Sam Carter Waddell and Joan Waddell, teaching tap dancing.
3:15 p. m.—Soprano solos, Hazel Dudley.
3:20 p. m.—Jean Moresco, tenor.
6:15 p. m.—Jean Moresco, tenor.
6:15 p. m.—Albert E. Sonn, 'Radio for the Layman.'' tary program, theatrical stars. WDAP—CHICAGO—360 -Organ recital; quartet. WFAA-DALLAS-176 1:20 p. m.—''Pep Peddlers.''
12 midnight—Choral and Glee Clubs.
KGW—PORTLAND, ORE.—492

m.—Dance music. KPO—SAN FRANCISCO—423 m.—Rudy Seiger's Orchestra. m.—Organ selections. m.—Japanese Romance. KHJ—LOS ANGELES—395 Layman."
3:30 p. m.—Harry Cox's Orchestra.
7:20 p. m.—Resume of Day's Sport
\*WNAC—BOSTON—278 1 a. m.—Art Hickman's Orchestra \*CHAC—MONTREAL—425 9 p. m.—To be announced. p. m.—Colonial Orchestra. p. m.—Colonial Orchestra. :30 p. m.—WNAC dinner--

n.—To be announced.

\*WOO—PHILADELPHIA—509
m.—Organ recital.
—Luncheon music. m.—Grand organ; trumpets 20 p. m.—Sports results; police repo p. m.—Meyer Davis's Concert Orchestra, p. m.—"The Friends Conference," Ida Millette, soprano; Caroline Hoffman, pianist; Ethel Kooker, reader. 130 p. m.—Meyer Davis's Orchestra; basep. m.—Boy Scout Radio Corps. 30 p. m.—Fairmount Park Symphor

rchestra; musical notes by Lacier. \*WIP--PHIILADELPHIA--509 0 a. m.—Seashore gossip.
0.10 a. m.—Health suggestions.
p. m.—"What Wild Waves Say."
105 p. m.—Radio Baby Clinic.
120 p. m.—Visiting artists' chats. p. m.—Hotel trio.
p. m.—Eleanor Gunn's fashion talk,
10 p. m.—Daily menu.
15 p. m.—Arts and decorations.
30 p. m.—Hotel organ recital.
30 p. m.—Market reports.

chestra. :05 p. m.—Kentucky Serenaders Orchestra. p. m.—Bedtime stories. :15 p. m.—Comfort's Philharmonic Orestra.
p. m.—"What Wild Waves Say."
p. m.—Murphy's Minstrels.
\*WDAR—PHILADELPHIA—395 Organ recital; features; orche p. m.—Orchestra, artist recital. p. m.—Dance music.

p. m.—Question period. \*WGR—BUFFALO—319 2:30 p. m.—Organ recital. 3:30 p. m.—Vincent Lopez's Orchestra. 30 p. m.—News; scores. \*WGY—SCHENECTADY, N. Y.—380 2 p. m.—Music, excerpts from "Pinafore." 6:30 p. m.—Organ recital. 9 p. m.—Radio drama, "Silas, the Chore \*WBZ—SPRINGFIELD, MASS.—337

p. m.—Leo Reisman ensemble. 30 p. m.—Songs by Bill Coty and Jack Armstrong.

40 p. m.—Songs by Bill Coty and Jack Armstrong.

40 p. m.—Leo Reisman Orchestra.

50 p. m.—Bedtime story.

p. m.—Novelty concert by F. O. Harrell

50 p. m.—Helen Studley, soprano.

\*WMAF—S. DARTMOUTH, MASS.—363 m.—Dinner music. m.—Mid-week church services. p. m.—Mid-week church services.
1:30 p. m.—Maximilian Mitnitzky, pianist.
1:45 p. m.—Jack Kimberly, barytone, accompanied by Irene Arduin.
3 p. m.—Maximilian Mitnitzky, pianist.
1:10 p. m.—Jack Kimberly, barytone.
1:30 to 10 p. m.—WEAF Country Club

group. \*WGI-MEDFORD, MASS.-360

6:30 p. m.—Dinner concert.
7:30 p. m.—Uncle Kaybee. Baseball scores
9:30 p. m.—Musical program.
11 p. m.—Moores's Radio Review.
WRC—WASHINGTON—469 m.-Children's hour. chaelson.

3:30 p. m.—To be announced.

p. m.—Dance program

WHAS—LOUISVILLE, KY.—400 WLW-CINCINNATI-423 p. m.—Civil service talk. p. m.—Doherty Melody Boys.

2:15 p. m.—Scalzo's Orchestra. 2:15 p. m.—Scalzo's Orchestra. 2:15 p. m.—Scores; inning by inning. 2:30 p. m.—Dinner concert. 3:0 p. m.—Baseball scores; concert. 3:0 p. m.—The children's period. p. m.—Concert, KDKA Little Orchell p. m.—Concert.

m.—Corcert. \*WCAE—PITTSBURGH—462

WSAI—CINCINNATI—309

10 p. m.—Solos by Ed Smith,
Tolken, Florence Braun; reading WJAX-CLEVELAND-390 p. m.—Bryan Brothers, Hungas Russian numbers.
 p. m.—Edwin Kraft, organist.

WOC-DAVENPORT-484

FRIDAY

\*WEAF-NEW YORK CITY-492 m.—Jeane Austin, pianist; talk

0 p. m.-Financial developm

\*WJY—NEW YORK CITY—405

Wilck, p. m.—Piano, solo, Percy Grainger.

p. m.—Piano, solo, Percy Granger, p. m.—Airpiane travelogue, p. m.—Edith Quisenberry, soprano, p. m.—Talk, Adrian Van Muffling. p. m.—Dr. Dorothy Bocker. p. m.—Harrison Marshall, tenor. p. m.—Marlham Martyne, soprano. p. m.—Marlk Strand singers.

\*WOR—NEWARK—405

5 p. m.—Carl Fischer, fluctist.

5:15 p. m.—Florence Lee in piano selections and talk.

3:30 p. m.—Helen Gleason, operatic com-

edy artist. :45 p. m.—Frances B. Pehl, pianist.

\*WGR—BUFFALO—319
2:30 p. m.—Organ recital.—
3:30 p. m.—Vincent Lopez's orchestra.
3-11 p. m.—Musical program. WHB-KANSAS CITY-411 m.—Dance program, m.—Popular dance program. m.—Musical program.
m.—Vincent Lopez's orchestra. WDAF-KANSAS CITY-411 \*WGY-SCHENECTADY, N. Y.-380 p. m.-International Sunday sch

1:30 p. m.—Musical program. \*WMAF—S. DARTMOUTH, MASS.—363 p. m.—Dinner music.

30 p. m.—Alberta Kawashima, violinist.

45 p. m.—Kathleen Stewart, pianist.
p. m.—George A. Leach, barytone.

15 p. m.—Kathleen Stewart, pianist.

30 p. m.—Alberta Kawashima, violinist.

45 p. m.—George A. Leach, barytone.

to 10 p. m.—John C. Smith's Dance Orchestra. "Good Reading." by the Rev. WMAQ—CHICAGO—448 6:30 p. m.—La Salle Orchestra. 9:15 p. m.—Mr. and Mrs. W. A. tenor and soprano. \*WGI-MEDFORD, MASS.-360 WEBH-CHICAGO-370

7:45 p. m.—Market reports.

8 p. m.—Tabloid radio talks; musicale.

\*WNAC—BOSTON—278

1 p. m.—Colonial Orchestra.

4 p. m.—Colidren's half hour. (:30 p. m.—Vocal, concert selections 1:30 p. m.—Trio; dance selections. 11:30 p. m.—Playlet; soprano solos; -WNAC dinner dance. . m.—To be announced. \*WBZ—SPRINGFIELD, MASS.—337

Hiatt, barytone.

1 p. m.—Concert by the Melody Makers 1 p. m.—Concert by WBZ Trio.
\*WJAR—PROVIDENCE—360
\*WJAR—PROVIDENCE—360

soprano. :30 p. m.—Grand organ recital.

10 a. m.—Housewives Radio Exchange.
10:45 a. m.—Miss Marle C. Koester, "Styl
of To-day."
1:05 p. m.—Twin Elm Orchestra.
5:05 p. m.—Musical program.
11 p. m.—Dance music, Providence Or tra. \*KDKA—PITTSBURGH—326

\*KDKA--PITTSBURGH--326
2:15 p. m.—Daugherty's Orchestra.
1:15 p. m.—Scores, inning by inning.
1:30 p. m.—Organ recital.
1. p. m.—Score; dinner concert.
1:45 p. m.—News bulletins.
2 p. m.—KDKA Serenaders; Davis
Quartet.
\*WCAE--PITTSBURGH--462
6:30 n. m.—Dinner concert.

Colonel H. Edmund Bullis.

11:30 a. m.—Leonard Barron in a talk.
11:30 a. m.—Leonard Barron in a talk.
11:50 a. m.—Market and weather reports.

4-5 p. m.—Harry Jentes, jazz planist;
Mary Rowe Davis, contralto.

5 p. m.—Waldorf-Astoria dinner music.

7:30 p. m.—Waldorf-Astoria dinner music.

7:30 p. m.—WashINGTON—469

3 p. m.—Fashion developments.

3 p. m.—Leslie O. White, barytone.

8:15 p. m.—Kathleen Stewart, planist.

8:20 p. m.—Leslie O. White, barytone.

8:15 p. m.—WashINGTON—469

3 p. m.—Current topics.

3:25 p. m.—Current topics.

3:35 p. m.—Plano recital.

4 p. m.—Song recttal.

5 p. m.—Dance orchestra.

9:30 p. m.—Tobic and songs for chill wCAP—WASHINGTON—469

8 p. m.—To be announced. :20 p. m.—'Beauty and Personality Elsie Pierce. :25 p. m.—Current topics. :35 p. m.—Plano recital. p. m.—Stories and songs for children. WCAP—WASHINGTON—469

WCAP—WASHINGTON—469
p. m.—To be announced.
45 p. m.—Captain Gorden Smith on 'Foreign Affairs.''
to 10:30 p. m.—Concert by the Navy 78
Band Orchestra.
WHAS—LOUISVILLE, KY.—400
p. m.—Alamo Theater Orchestra. 5 p. m.—Alamo These. 8:30 to 10 p. m.—Concert. WLW—CINCINNATI—423

-Special program. WWJ--DETROIT-517 day. :30 p. m.—Ernie Golden's Orchestra, di- 7 p. p. m.—Schmeman's Concert Band. WCX—DETROIT—517 rect. 3:15 p. m.—"Problems of Retailing," Pro-fessor Brisco. 8:30 p. m.—Dance program.
WOC—DAVENPORT—484 fessor Brisco. 8:30 p. m.—New York Philharmonic Or-9 p. m.—Musical program.
WDAF—KANSAS CITY—411 chestra.
10:15 p. m.—Pop Question Game.
10:30 p. m.—Harold Stern's Orchestra, di-

KYW—CHICAGO—536 5:45 p. m.—Children's bedtime story. 7:30 p. m.—Musical program. 7:30 p. m.—Children's bedtime story,
8:20 p. m.—Speeches,
12 p. m.—Luncheon orchestra.
2 p. m.—Luncheon orchestra.
2 p. m.—Eddles' period.
5:15 p. m.—Rita Melvia, dramatic soprano.
5:45 p. m.—Frank Herel, violinist.
5:45 p. m.—Cholly's Cinderella Orchestra.
6:50 p. m.—To be announced.
6:70 p. m.—To be announced.
6:80 p. m.—To be announced.
6:80 p. m.—To be announced.
6:90 p. m.—To be announced.
6:90 p. m.—To be announced.
7:30 p. m.—Vocal and concert selections
9:15 p. m.—Judith Roth, Al Williams 1:20 p. m.—Tenor and descriptions
9:10 p. m.—Tenor and descriptions

7:30 p. m.—Vocal and concert selections.
9:30 p. m.—Tenor and dance numbers.
11:30 p. m.—Violin and dance numbers.
WLS—CHICAGO—345 -11 a. m.—Woman's hour.

15 p. m.—Judith Roth, Al Wilson, singing of p. m.—Jimmy Flynn, tenor.

40 p. m.—Bob Miller, songs.

45 p. m.—Musical program.

p. m.—Tom Bracken and Bob King.

11:30 p. m.—Violin and dance numbers.

WLS—CHICAGO—345

11:30 p. m.—Violin and dance numbers.

WLS—CHICAGO—345

40:30 to 11 p. m.—Music; lullaby time dairy products review.

WDAP—CHICAGO—360

11:30 p. m.—Jack Chapman's Orchestra. 11 p. m.—Jack Chapman's Orchestra RFKX—HASTINGS, NEB.—280

3 p. m.—Tom Bracken and Bob King, songs.
3:45 p. m.—Chat with the children.
4 p. m.—Jos. C. Wolfe, barytone.
4:15 p. m.—Mabel Livingstone, "A Child's Tome — Randall's Royal Orchestra.
Day in Song."
4:30 p. m.—Mary Meares, soprano.
5 p. m.—Billy Page's syncopators.
6:30 7:30 p. m.—Olcott Vail's Trio, Paul Specht's dance orchestra.
10 p. m.—Palisades Park Orchestra.
10 p. m.—Baseball statistics.
10:05 p. m.—Wright and Bessinger, singers.
11:15 p. m.—Studio concert.
12:05 a. m.—Hoot Owls.
13:05 p. m.—Wright and Bessinger, singers.
14:15 p. m.—Charker Specific Orchestra.
15:15 p. m.—Charker Specific Orchestra.
16:15 p. m.—Organ recital.
16:15 p. m.—Organ recital.
17:40 p. m.—Charker Jovanna Royal Orchestra.
18:45 p. m.—Charker Jovanna Royal Orchestra.
19:15 p. m.—Hoot Owls.
19:16 p. m.—Hoot Owls.
19:16 p. m.—Hoot Owls.
19:16 p. m.—Hoot Owls.
19:17 p. m.—Randall's Royal Orchestra.
10 p. m.—Charker Jovanna Royal Royal Orchestra.
10 p. m.—Charker Jovanna Royal Orchestra.
11:15 p. m.—Studio Concert.
11:15 p. m.—Studio Concert.
12:10 p. m.—Hoot Owls.
12:10 p. m.—Hoot Owls.
12:10 p. m.—Hoot Owls.
13:10 p. m.—Randall's Royal Orchestra.
14:10 p. m.—Charker Jovanna Royal Orchestra.
15:10 p. m.—Charker Jovanna Royal Orchestra.
16:15 p. m.—Charker Jovanna Royal Orchestra.
17:10 p. m.—Charker Jovanna Royal Orchestra.
18:10 p. m.—Charker Jovanna Royal Orchestra.
19:10 p. m.—Charker Jovanna Royal Orchestra.
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19:10 p. m.—Charker Jovanna Royal Orchestra.
10 p. m.—Charker Jovanna Royal Orchestra.
10 p. m.—Charker Jovanna Royal Orchestra.
10 p. m.—Charker Jovanna Royal Or

ers.

10:15 p. m.—Jos. C. Wolfe, baryone.

10:30 p. m.—Roseland Dancing Academy.

11 p. m.—Musical program.

11:30 p. m.—Club Alabam Revue.

\*WEBJ—NEW YORK CITY—273

\*WMAF-S, DARTMOUTH, MASS.-363 30 p. m.—Jeane Austin, singer and pian ist.
7.45 p. m.—Anne B. Tyndall, soprano.
8 p. m.—Bernard Frank, harmonica player
8:15 p. m.—Jeane Austin.
8:30 p. m.—Effite de Niffen, planist.
9 p. m.—Effite de Niffen, planist.
9:20 p. m.—Effite de Niffen, planist.
9:20 p. m.—Effite de Niffen, planist.
9:35 p. m.—Effite de Niffen, planist.
\*WJZ—NEW YORK CITY—455
1 p. m.—Vanderbilt Hotel Orchestra.

\*WFBH-NEW YORK CITY-273
11 a. m.-Religious services: kiddles :40 p. m.—Joe Sherman, offering :50-8:50 p. m.—Songs. \*WAAM—NEWARK—263 p. m.—Dinner hour concert.
\*WIP—PHILADELPHIA—509

9 to 11 a. m.—Religious services; kiddies' period.
2 to 4 p. m.—Jimmy Beavers's singing orchestra, Jack Niles, Mildred Gardiner; orchestra, Ellsworth Morss and Alvin Hauser in songs, readings and music, which was been song writers.
2:15 p. m.—Henny Cogert, Charles Hirst, song writers.
2:30 p. m.—Gene Austin, bayytone.
2:45 p. m.—Ellen M. Cross, concert.
4:16 p. m.—Ellen M. Cross, concert.
4:16 p. m.—William B. Mahoney, barytone.
4:25 p. m.—Jesse Calkins, tenor.
4:26 p. m.—Catello's entertainers.
5:30-7:30 p. m.—Alamac and Paul Specht's dance orchestra.
7:30 p. m.—Bett Reith's harmonists.
8 p. m.—Bett Reith's harmonists.
8 p. m.—Jimmy Flynn, tenor. tions.

3 p. m.—"What Wild Waves Say."

3:05 p. m.—Visiting artists chats celebrities.

3:30 p. m.—Comfort's Philharmonic chestra. :05 p. m.—Eddie Elkins' Orchestra.

The state of the s

\*WDAR-PHILADELPHIA—395

12 noon—Organ recital; features.
2 to 3 p. m.—Concert orchestra recital.
4:30 p. m.—Dance program.
5:45 p. m.—Baseball scores.
7:30 p. m.—Dream Daddy.
8:15 p. m.—Dance music.
8:30 p. m.—Welch Minstrels.
9:15 p. m.—Benson Orchestra.
9:30 p. m.—Charley Fry's Orchestra.
10 p. m.—Arcadia Orchestra; Benson Cleago Orchestra; recital of theatrical etertainers.

\*WOO—PHILADELPHIA—509

11 a. m.—Organ recital. 130 p. m.—Bert Reith's harmonists, p. m.—Jimmy Flynn, tenor.
15 p. m.—Louis Segerer, selections.
130 p. m.—Kathryne R. Behnke, Marion Carr singing.
145 p. m.—The Perfect Harmony Four Male Courter. 45 p. m.—The Male Quartet Male Quartet.
9:15 p. m.—Doris Schroeder, contraito.
9:30 p. m.—"The United States Constignation," George Hiram Mann.
9:45 p. m.—Ellen M. Cross concert.
10:15 p. m.—Fitzpatrick Brothers, singing.
10:30 p. m.—Baseball statistics.
11 p. m.—Jimmy Clarke's entertainers.
11:30 p. m.—Roseland dance orchestra.
\*WBBR—STATEN ISLAND, N. Y.—273
3 p. m.—String duet.

3 p. m.—String duet. 3:15 p. m.—Bible questions and answers by Judge J. F. Rutherford. 3:45 p. m.—String duet. dinner music. 8:30 p. m.—WOO Orchestra; Mabel Rumig. "WOR-NEWARK-405 2:30 p. m.—Howard C. Townley, barytone.
2:36 p. m.—Edward Cohen, violinist.
3 p. m.—Caroline Thomas's String Trio.
3:30 p. m.—Howard C. Townley, barytone.
3:46 p. m.—Edward Cohen, violinist.
6:15 p. m.—Edward Cohen, violinist.
6:15 p. m.—Ernie Krickett's Orchestra.
7:15 p. m.—Resume of day's sports.
8 p. m.—Park City Four concert.
8:15 p. m.—Barytone solos, James Macdonald. 10 p. m.—A. Candelor's Dance Orches 11:03 p. m.—Dance program. \*WFI—PHILADELPHIA—395

p. m.—Meyer Davis's Concert Orchestra. 3
p. m.—Regina C. Marsh, contralto; Helen 6
Rowley, violinist; duets by Aleta Smith 7
and Eldon E. Smith; talk by Mrs. James
W. Hughes.
6:30 p. m.—Meyer Davis's Orchestra. donald. 30 p. m.—S. S. America Orchestra, 30 p. m.—Concert by the Park City 45 p. m.—Barytone solos, James Macp. ni.—American Legion program. \*WBS—NEWARK—360

to 2:15 p. m.—Dance music.
WFI—PHILADELPHIA—295 m.—Fairmount Park Symphon hestra; musical notes by Samue \*WIP—PHILADELPHIA—509 a. m.—Seashore gossip; health talk.

Organ recital.
"What Wild Waves Say." 05 p. m.—Visiting artists.
30 p. m.—Comfort's Philharmonic chestra. 05 p. m.—Kentucky Serenaders Orches. tra.
p. m.—Bedtime stories.
p. m.—Comfort's Philharmonic Orchestra., "What Wild Waves Say."

:50 p. m.—Vessella's Concert Band.
0 p. m.—Bob Leman's Dance Orchestra.

1:05 p. m.—Organ recital.

\*WGY—SCHENECTADY, N. Y.—380

\*WGR-BUFFALO-319 12:30 p. m.—Organ recital.
\*WNAC-BOSTON-278 \*WNAC—BOSTON—246

\*\*S:15 p. m.—Dance music.
9:30 p. m.—Dance music; songs by Irving
Croker, Ted and Dick Waterson, Don
Ramsay.

\*\*WGI—MEDFORD, MASS.—360 7:15 p. m.—Code practice lessom
7:30 p. m.—Talk; musicale.

\*WEAF—NEW YORK CITY—492

Elmer Grosso's Orchestra.

\*WEAF\_NEW YORK CITY\_492

-5 p. nn.—Elmer Grosso's Orchestra.
p. m.—Waldorf Astoria dinner music.

30 p. m.—Jeane Austin, singer pianist.

45 p. m.—Anne B. Tyndall, soprano.
p. m.—Bernard Frank, harmonica player.

130 p. m.—Jeane Austin.

130 p. m.—Effice de Niffen, pianist.

p. m.—Eight Volga Singers.

20 p. m.—Effice de Niffen, pianist.

20 p. m.—Effice de Niffen, pianist.

35 p. m.—Eight Volga Singers.

0-11 p. m.—Vincent Lopez's Orchestra. 3-11 p. m.—Vincent Lopez's Orchestra \*WBZ—SPRINGFIELD, MASS.—33 p. m.—Leo Reisman's Ensemble.

30 p. m.—Leo Reisman's Orchestra.

30 p. m.—Bedtime story.

40 p. m.—Bedtime story.

40 p. m.—Dorothy Eaxter, violinist; Joseph Lane, cellist.

\*WJAR—PROVIDENCE—360

55 p. m.—Miscellaneous program

:10 p. m.—Miscellaneous program. :10 p. m.—Musical program. \*\*KDKA—PITTSBURGH—326 7 p. m.—Scores; dinner concert.
7:30 p. m.—Children's period.
7:45 p. m.—Feature.
8 p. m.—Scores; sport review, James J.
Long. p. m.—Scores; sport Long.

p. m.—Concert by Westinghouse Band.

\*WCAE—PITTSBURGH—462

Dinner concert.

tions.
9:30 p. m.—Musical program.
WRC—WASHINGTON—469
7:45 p. m.—Bible talk, W. H. Kerr.
5 p. m.—Dance program.
9 p. m.—Piano recital, La Salle Spier.
9:30 p. m.—Violin recital, Henri Sokoloft. p. m.—Song recital.
WHAS—LOUISVILLE, KY.—400

8:30 to 10 p. m.—Sylvian Trio.

WSAI—CINCINNATI—309

8:15 p. m.—Mixed quartet.

9:20 p. m.—Soprano solo, Helen Jane Upperman. 12 p. m.—Freda Sanker's Ragamuffins. WWJ—DETROIT—517 7:30 p. m.—Schmeman's Concert Band. WCX—DETROIT—517 p. m.—Dinner concert. WOS—JEFFERSON CITY—441 Policious service; y

band concert.

WDAF—KANSAS CITY—411 and music. 12:45 a. m.—Nighthawk Frolic. WOC—DAVENPORT—484 WOC-DAVENTORI10 p. m. Orchestra program.
WLS-CHICAGO-345
7:45 p. m. and 1 a. m.—Lullaby
dance program.
WDAP-CHICAGO-360
VDAP-CHICAGO-360

p. m.—Jack Chapman's Orchestra.

KYW—CHICAGO—536 6:45 p. m.—Children's bedtime story.
7 p. m.—Dinner concert by Joska De Babary's Orchestra and Paul Whiteman's "Collegians."
3 p. m.—Musical program by artists.
9 p. m.—Talk by Vivette Gorman.
9:05 p. m.—Short stories, humorous sketches.

WMAQ—CHICAGO—448

6:30 p. m.—La Salle Orchestra.

8 p. m.—Auburn Park Lions Boys' Band.

9 p. m.—Theater review.

WEBH—CHICAGO—370

Diana vacal numbers.

7:30 p. m.—Piano, vocal, numbers, 9:30 p. m.—Sporrano solos; story; selections.

11:30 p. m.—Guitar duets, tenor solos; story; dance dance numbers.

WOAW—OMAHA—526

7 p. m.—Popular half hour.

7:30 p. m.—Baxter's Orchestra.

14 p. m.—To be announced.

KGW—PORTLAND, ORE.—492 a. m.—Scores; George Olsen's Orchestra. KPO—SAN FRANCISCO—423

KPO—SAN FRANCISCO—423
7:30 p. m.—Rudy Seiger's Orchestra.
1 to 3 a. m.—Art Weioner popular artista.
KHJ—LOS ANGELES—395
1 a. m.—Art Hickman's Orchestra.
7 p. m.—Kiddies' stories.
7:30 p. m.—Rex Battle's Orchestra.
8:30 p. m.—Studio entertainment.
10:30 p. m.—Joseph C. Smith's Dance Orchestra. m.—Vanderbilt Hotel Orchestra.

m.—Herman Riedrich jr., basso.

p. m.—Roger Wolfe's Orchestra.

m.—Walderf-Astoria Roof Orchestra.

m.—Walderf-Astoria Roof Orchestra. 8 p. m.—Alexis Kudisch Ensemble; Ruth
Arden, soprano.
10 p. m.—Museum of Natural History talk. 8:30 to 11 p. m.—Concert by the violation,
10:30 p. m.—Hotel Astor Dance Orchestra.

## Dance Orchestras for This Week

TO-DAY
Wave
length. Orchestra.
360 Sterling
360 Paul Specht's Denault's
Sterling
Irving Nagel's
Paul Whiteman's
Palisades Park
Bob Leman's
B. J. Goodman's THURSDAY, AUGUST 7 MONDAY, AUGUST 4 509 Frisco Serenaders
319 Vincent Lopez
273 Westminster
360 Vail's and Specht's
360 Roseland
360 Palisades Park
380 Imperial
455 Ernie Golden's
609 Candelori's
462 Greenwich
319 Vincent Lopez
509 Candelori's Roger Wolfe's Cummins's WEDNESDAY, AUGUST 6 WIP 509 Bob Leman's WHN 860 Vail's and Specht's Shepard Colonial 319 Vincent Lopez WGR Billy Page's Gene Ingraham's 20th Cent. Sextet Bud Fisher's Palisades Park Copley Plaza Clover Gardens TUESDAY, AUGUST 5 360 St. Louis
360 Vall's and Specht's
278 Shepard Colonial
319 Vincent Lopez
405 Halsey Miller's
492 Pavilion Royal
405 Billy Wynne's WHN WHN WNAC WGR WOR WEAF WJY

Ky. Serenaders
Harry Cox's
Vail's and Specht's
Visi's and Specht's
Westminster
Murphy's Minstrels
Al Reiser's
Pete Macias's
Vincent Lopez
Roseland
Waldorf-Astoria
Schmeman's FRIDAY, AUGUST 8 Bihly Page's
Eddie Elkins's
Vall's and Specht'
Shepard Colonial
Vincent Lopez
Ernis Golden's
Ernie Golden's
Leonard Nelson's
Serenaders
John C. Smith's
B. Fischer's

Benson's Chicago Palisades Park B. Fischer's Candelori's Arcadia & Benson': Roseland Harold Stern's Vincent Lopez Providence Candelori's SATURDAY, AUGUST 9 Tom Banks's
Elmer Grosso's
Ky. Serenaders
Vail's and Specht
Ernie Krickett's
Waldorf-Astoria Wastori-Astoria
Wastminster
Dance program
Copley Plaza
Vincent Lopez
Bob Leman's
Astor Hotel
J. A. Chickene's
Roseland

# radio set in America should have Socket 13



Eliminates dry cells and "B" storage batteries.

Can be used on any set-in any home where ordinary alternating house current is available.

Plugs permanently into a lamp or wall socket. Snaps "ON" and "OFF" like an electric light.

Gives full-wave rectification—therefore clear, strong, hum-free reception, at a cost of only 1/4c a day

No tubes to burn out—no water to add -no acid to corrode-no high voltage transformers—no moving parts to get out of order.

Use Socket Power "B" on 6-volt tube sets in combination with Socket Power "A" (see on right) or with a good storage "A" battery and charger.

Sold by leading radio and music stores and by Philco Diamond-Grid Battery dealers.

Philco Socket Power "B" smooths out your bumpy house current, making it equal to the absolutely smooth current of a "B" storage battery. Gives better reception than dry cells because its voltage does not fall off with age. Price for 50-60 cycle 105-125 volt alternating current .....\$47.50

For one-switch control and the best possible radio reception, use BOTH "A" and "B" Socket Power

For 6-Volt Tube Sets, either "A" or "B" Socket Power may be used alone, but for one-switch control, use both together. Plug the "B" into the built-in socket on the "A." Plug the "A" into your house current. Both "A" and "B" (and the radio set as well) are then controlled by the one SOCKET POWER "A" switch. Snap it "ON" and enjoy your radio. Snap it "OFF"

Socket Power "A" is a complete "A" power unit. It supplies "A" battery current automatically-without any thought about recharging.

Socket Power "A" for 50-60 cycle 105-125 volt alternating current......\$42.50

For 3-Volt Tube Sets, such as Radiola Super-Heterodyne, use Socket Power "AB." Both "A" and "B" power are built into one cabinet, satin-finished in brown mahogany. Everything controlled by one switch-your "A" power, your "B" power, even the radio set itself. Snap it ON and enjoy your radio. Snap it OFF and go to bed.

Socket Power "AB" for 50-60 cycle 105-125 volt alternating current.....\$65.00

(Prices complete—no rectifying tubes to buy)

### Philadelphia Storage Battery Company Philadelphia

New York Office-824 Liggett Building, 41 E. 42nd Street (Phone: Vanderbilt 1051)



World Radio History

# THE NEW YORK HERALD New York & Tribune RADIO MAGAZINE

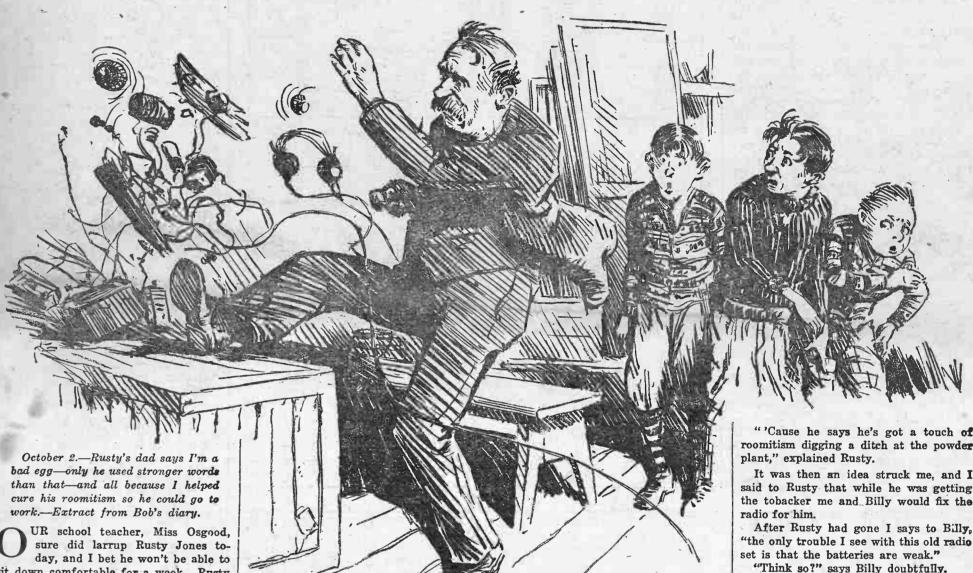
SECTION TWELVE

SUNDAY, DECEMBER 6, 1925

### Bob's Radio Cure for "Roomitism"

The Boy Radio Fiend and His Chum Discover That the Batteries in Rusty's Radio Set Are Weak; Their Remedy Proves Surprising to Old Man Jones

By H. L. VAN DEUSEN



sit down comfortable for a week. Rusty is one of the fellers who has got to be a radio bug since we had a school entertainment and raised money to buy a radio

This morning Rusty came strolling in to school, after being out all week, and Miss Osgood asked him where his written excuse from his parents was.

"I ain't got any," says Rusty. "Why were you not in school?" asked Miss Osgood sharply.

Rusty rubbed his eyes with his fist and says: "You remember my dog Snappy?"

"Yes," she replied. "What of it?" "Well, Snappy died and I had to stay home and dig a grave to bury him in," exclaims Rusty.

"Do you mean to stand there and tell me that it took you four days to dig a grave for your dog's body?" said she. "Yes, marm," says Rusty,

"Four days to dig a dog's grave. How do you account for that?" snapped Miss

"I struck rock," says Rusty. And that was when the teacher larruped

After school me and Billy Rich walked home with Rusty, and I told him he oughter have padded his pants good before he came to school and then it wouldn't have hurt him so much when the teacher

#### Foresight vs. Hindsight

"There's lots of things we think of when it's too late," says Rusty with a grin. "Where was you, anyway?" asked Billy. "I was building a radio set," says Rusty. "Radio set!" says I.

"Yep," says he. "I had been wanting

one of my own ever since our class got one for the school, but I didn't have the

"How does it work?" I asked. "Petty good," says he, "only I can't seem to get the squeal out of it."

"What you need," says Billy, "is a pair of experts like me and Bob to look over your set and tell what's wrong with it." "Gosh, will you?" he asked.

Well, as we had nothing particular to do just then we walked over to Rusty's house to look his radio set over. Rusty's father was home, in fact, that is where you generally find him. My dad says Rusty's father is the champion job holder, having held more jobs than any ten men in Ponckhockie.

Rusty explained that his father had just threw up a job at the powder plant. It seems that the men who work there are not allowed to carry any matches in their clothes on the job, and smoking is strictly

The other day Rusty's father was busy with some other men digging a ditch when the superintendent came along. He had an unlighted cigar in his mouth, which he kept rolling from one corner to the other

"Pretty hard digging, Jones?" he asked. "Nope, nothing unusual," says Rusty's

father. "Got a match?" asked the super, as he removed the cigar from his mouth.

"Sure," says Jones, reaching in his pocket and handing one to the super.

"Report at the office and get your time. You're through," snaps the super, and that's why Rusty's father is not working

Rusty says that his dad was thinking some of getting a job in a radio plant until he told him about the radio waves Miss Osgood was explaining to us the other day, and Rusty's father said that job was off, as one reason why he hadn't been a sailor was because the waves always made him sick.

#### A Good, Light Job

Rutsy said he didn't know just what kind of a job his dad would look for next, and any way he wasn't overstrong.

"Maybe he could get work in the 'lectric plant. That oughter be a light job," said Billy with a grin.

Then before Rusty could get mad I asked him where his radio was and he showed us.

While we were tinkering with it Rusty's dad came out to the woodshed after Rusty to go to the store and get him some

tobacker. "Just when I am busy the most he wants me to do something," grumbled Rusty, "even if it is only across the street to the

"Why don't he walk over and get his own tobacker?" asked Billy.

After Rusty had gone I says to Billy,

'the only trouble I see with this old radio

"Think so?" says Billy doubtfully. "I know so," I replied, "and what we oughter do is to hook up the wire with one of the live 'lectric wires in the street."

"We'd be in a fine pickle if we got caught," observed Billy. "I mean just a temporary hook-up to

see how it would work," says I. "Rusty" got enough wire here to run a cable across the Hudson River and back.'

"But we might get an awful shock of "lectricity," objected Billy. "Who's afraid of an old shock?" says L

"I ain't if you ain't," retorted Billy, "but we oughter have some rubber gloves or something on our hands."

"There's a pair of rubber gloves on the nail back of you," says I.

#### Billy Shins the Pole

We got the gloves down and then we nearly had a fight to see who should shin up the pole and hook up the wire, and we tossed up a cent. Billy won and shinned up the pole after I had attached one end of the wire to Rusty's radio set.

"Gosh," says Billy after he had shinned down the pole, "I bet there's a million billion volts in that wire."

"I hope there is," said I, as I saw Rusty's father coming out to see what was keeping Rusty.

"Ding, dang that boy!" said Rusty's father; "he's always stringing wire around where I am apt to trip over it"; and then

he swings a lusty kick at the charged wire. Well, there may not have been a million billion volts in it as Billy said, but there was enough, for Rusty's father let out one yell that could be heard for ten blocks. Then, as he picked himself up from where

(Continued on page seven)

## Four Types of Amplifier Arrangements for Wagnifying Radio Signals

The Author Says All Systems Should Be Tried When in Doubt as to Which Is Best By ROBERT HERTZBERG

HE adoption to broadcast reception of certain types of audio amplifiers which heretofcre have existed only in a few laboratories and in engineering textbooks has been of material advantage in the attainment of clear reproduction of voice and music; but it has also served to bring about a general confusion of the circuits themselves, of the apparatus used in them and of the designations applied to the systems and their components. The perennial transformer amplifier has never caused much trouble, but with resistance amplifiers, choke coil amplifiers, impedance amplifiers and auto-transformer amplifiers now commanding a good deal of public respect, the untechnical experimenter not infrequently tangles himself in a maze of diagrams and instruments that appear deceptively alike in outline, but are actually considerably unlike in construction and operation.

An excellent example of this confusion centers around the auto-transformer and choke coil types of circuits. The hook-ups are identical except for the difference that the choke coils have two connections on them and the auto-transformers have three. This is a slight variation, which radio fans are prone to dismiss as the work of some prolific circuit-changing "bug," but actually it marks the difference between two circuits that are entirely unlike in electrical operation.

#### Four Amplifier Arrangements

There is a total of four audio amplifier arrangements if the mechanical features of the group are compared, and only two systems if the fundamental theories of operation are considered. This may sound strange to the fan who reads the radio publications and recalls the diversity of circuits he has seen in them, but it is the unquestionable technical truth.

The quartet comprises the transformer coupled amplifier, the resistance coupled, the choke coil and the auto-transformer. The omission of the "impedance" type is not an error, for the terms "choke coil" and "impedance," when applied to audio amplifiers, are synonymous and indicate the same instrument. "Impedance" is a characteristic of certain electrical devices, so the term "choke coil," designating the tangible apparatus used in the circuit, is the correct one.

The transformer amplifier, as it has been employed for many years, falls in the same category as the auto-transformer amplifier, and, despite some evident differences in their wiring diagrams, the two work in exactly the same fashion. The auto-transformer system is frequently and entirely erroneously referred to as a "choke coil" or impedance system, even by people who ought to know better, but it is not anything like the choke coil.

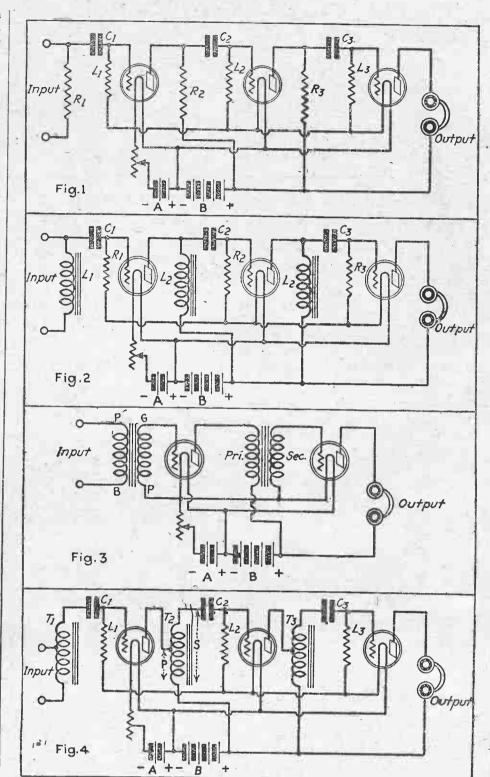
Similarly, the resistance and the choke coil amplifiers fall into a second class and also perform in a like thoretical manner.

#### Theory of Transformer Amplifier

The theoretical action of the transformer amplifier is fairly well known, as it involves a rather basic principle of electricity. The current flowing from the detector tube of a set into the primary of the transformer sets up a fluctuating magnetic field in the iron core of the instrument, and the magnetic field in turn generates a current of electricity in the secondary winding, which is wound on the same core and which is therefore susceptible to the magnetic impulses.

The electrical voltage or pressure developed across the secondary depends directly on the ratio of the number of turns in the primary coil to the turns in the secondary coil. The ratio may be anywhere from 2.1 to 6.1 in standard transformers, which means that the transformers bring about an increase in the voltage from two to six times its original value. The vacuum tube is a voltage operated device, so the transformer is responsible for a decided amplification of the original radio signal as represented by the voltage fed the input of the amplifier system.

The usual transformer amplifier consists of two transformers, two tubes and



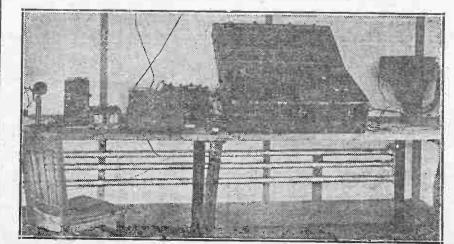
The above figures 1, 2, 3 and 4 show the wiring diagrams for resistance coupled, choke coil, transformer and auto-transformer coupled amplifiers respectively

The auto-transformer amplifier, pictured diagrammatically in Figure 4, operates on exactly the same principle of voltage stepup by virtue of turns ratio. Here, however, the voltage transformers, as they truly are, are not constructed with separate primary and secondary windings, out instead have the primaries arranged | ference in size between the primary and as parts of the secondaries. Actually the secondary coils. The current flowing auto-transformer consists of a single through the "P" section of T2 of Figure 4 straight coil of wire, wound on an iron core, with two connections leading from the whole coil, and a voltage is induced the ends of the wire and a third from some predetermined turn somewhere in voltage, as measured across the extreme

the associated incidentals, as shown in always be distinguished from choke coils because they unfailingly are equipped with three binding posts, while the chokes have only two. Likewise they need not be confused with straight transformers, because the latter have four terminals.

Step-Up Voltage As with the double winding transformer, sets up a fluctuating magnetic field around across the entire winding. The secondary the winding. Auto-transformers can | ends of the coil, depends on the ratio that

#### This Apparatus Picks Up Time Signals



The semi-automatic medium wave receiver and amplifier at Station WBZ, Springfield, Mass., which is used twice daily to receive for rebroadcasting on 333 3-10 meters the time signals sent out by the U.S. Navy Station, NAA

exists between the whole coil and the section from where to the tap is taken down to the lower terminal.

The grid condensers, C1, C2 and C3, of the auto-transformer amplifier are necessary to keep the high voltage of the B battery off the grids of the tubes, where it otherwise would completely paralyze the bulbs. These condensers block the direct current of the battery, but they offer little resistance to the fluctuating currents that carry the sound of the amplified voice or music. The grid leaks, L1, L2 and L3, are required to prevent the condensers from being blocked by a peculiar building-up action of the grid circuits.

If the primary taps of the auto-transformer are moved up to the tops of coil, the auto-transformers will become choke coils and the circuit will develop into that of Figure 2. However, the transformers will then cease to be transformers and will not increase the voltage appreciably, if

The amplification per stage afforded by this type of amplifier is equivalent only to the amplification constant of the tube, the actual figure varying between seven for the 201A tubes and forty for some of the special bulbs designed for this particular

#### Purpose of Choke Coils

The choke coils (L1, L2 and L3, Fig. 2) serve merely to deliver the varying output of one tube to the input of the next: or, in other words, to impress the effect of the varying voltages across them onto the grids of the succeeding bulbs. The variations that take place across the chokes are the amplified reproductions of the weak currents carrying the sound impulses, and exist by virtue of a complicated tube phenomenon, which the radio fan need not investigate. The action of the tube is such that, although the voltage or electrical pressure existing across the choke coils fluctuates in direct accordance with the voice modulations, the actual amount of current flowing in the plate circuits, and therefore through the chokes. remains constant. The test of a choke coil amplifier is, in fact, the ability of a plate milliammeter to remain unchanged in needle reading, while the amplifier is functioning with a normal receiving set.

Resistance-coupled amplifiers operate in practically the same theoretical fashion. For purposes of obtaining the amplified signal in the plate circuit of one amplifier tube and of transferring it to the grid circuit of the next tube, the device in the plate circuit may be any high "impedance," and both choke coils and simple resistances give exactly the same effect. As far as actual results at the loud speaker are concerned; there is little choice between the two classes of devices, providing the individual chokes and resistances selected for comparison are of equivalent quality.

#### Advantage of Choke Coils

The choke coil arrangement possesses one indisputable advantage over the resistance in that it is capable of operating perfectly with an ordinary 90-volt B battery, while the resistance systems all require at least 135 volts. This situation exists because the choke coils themselves have a comparatively low ohmic resistance and no great amount of B battery pressure is necessary to push a weak current through them, whereas a considerable drop in voltage occurs across the straight resistances. The actual battery consumptions are about the same, though, the resistance amplifier merely requiring more initial voltage to obtain the current through its coupling units.

The writer deems it irrelevant to express an opinion on the respective merits of the aforementioned four-amplifier systems, and wishes only to have a few simple facts about the circuits themselves understood by radio fans. Each system has its defenders and enemies, who are always ready to point out some inconsistency in each other's statements. If you are in doubt as to which is the elusive "best" amplifier, try them all and let your own ear judge for itself.

#### News and Notes of the Radio Trade

research and experimenting with ap- secondary of the first audio transparatus designed to eliminate the A former to clear up noise in the set. and B batteries of a radio receiving The Cunningham variable resistor is set, Walter E. Holland, chief research | manufactured by the R. P. Cunningengineer of the Philadelphia Storage ham Electric Company, 319 North Battery Company, announces the per | Whipple Street, Chicago, fection of units that successfully operate a receiver on current from an

Mr. Holland, may be plugged into a dising sales department in the Boslamp or wall socket as one would ton office of the Westinghouse Elecplug in a vacuum cleaner or other tric and Manufacturing Company, household appliance. The units are has just been appointed manager of built into one case for dry-cell tube the receiver section in the Westingsets and in separate cases for storage house radio department with headbattery tube sets. One switch con- quarters in New York. trols both A and B.

eliminators developed, the new unit through his previous connection with is safe to use and free of any ob- Thomas A. Edison, Inc., the Edison cording to Mr. Holland, the unit will the American Ironing Machine Comdeliver enough power to operate a pany of Chicago. number of large tubes and yet will not | The appointment became effective give too much voltage to shorten the at once, and Mr. Hillier assumed the life of small tubes.

The A socket power unit supplies He will be responsible for all busipower equal to storage battery cur- ness of the receiver section of the rent for sets having storage battery tubes. For sets employing three-volt at 150 Broadway, New York. tubes, Mr. Holland has designed a combination A-B unit with a single

switch control. Since radio became popular fans sets could be powered by house current. Many fans do not understand problem. But Mr. Holland explained the problem which confronted him Entertainment All Day Long

liver smooth direct current—that is, plete day of listening for its radio current that flows in one direction audience on Thanksgiving. Inasmuch and without fluctuations. On the other as the day is one of rest, recreation "periodic" or "aperiodic," but there hand, the current delivered to house and thanks for the blessings we have is no half way condition. A wires from an electric generator is received, WJZ will give the listening "periodic" circuit is one capable of in almost all cases alternating curfans a few more things to be thankrent—current that flows through the ful for. The schedule for the day oscillating when properly excited, but

open-circuit gaps.

nating current so that it flows in one known as the Rev. Peter Kiljoy, and direction as direct current, it is still also one of his leading roles as unfit for radio use and will produce | Cardinal Wolsey. only a hum or noise, due to the fact that it is a fluctuating or rippling Difference Between Class A type of direct current. The ripple And B Broadcasting Stations must be smoothed out. This is done by a combination of choke coils and A and Class B broadcasting stations fixed condensers, known as a filter has dwindled till there is practically

"It will be readily understood that of classifying stations when first the continuous flow of rippling cur- conceived was to limit all stations rent from a full-wave rectifier may using a power of less than 500 watts be smoothed out much more perfectly in the antenna to Class A. Class B than the succession of separate stations were required to use 500 surges of current coming from a watts or more and be supplied with half-wave rectifier.

ploys full-wave rectification with the station to shut down due to failsmall aluminum electrolytic rectifier ure of some mechanical part of the cells. These cells have very long life circuit. Also they were not allowed and never need the addition of water," to reproduce mechanical music

tween the same clips as the present accurate results are desired us fixed resistor, and is readily adjust-299,820 as the constant.

Power From Lighting Current | able by turning a small knurled After nearly two years of intensive screw. It can also be used across the

Promotion in Boston Office Clifford G. Hillier, for the last The A and B units, according to three years manager of the merchan-

Mr. Hillier is a Boston man, edu-The B unit eliminates both storage cated in Boston schools and thorand dry B batteries. Unlike the first oughly trained in the electrical field jectionable hum or distortion. Ac- Illuminating Company of Boston and

> duties of his new office December 1 radio department, and will be located

De Forest Cuts Tube Prices Retail price reductions on all De Forest radio receiving tubes as have been wondering why some means result of specialized manufacturing could not be perfected whereby their processes, increased production and greater sales were announced last week by the De Forest Radio Comthe difficulties encountered by the endealers throughout the country. The new prices become effective at once.

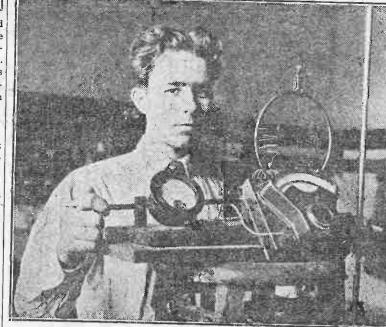
Station WJZ has outlined a com wires in surges or waves, first in one includes a period of religious devo- an "aperiodic" circuit is one posses-

Dickson-Kenwin will impersonate for "Now, after rectifying the alter- the radio audience an English parson,

The differentiation between Class no barrier between them. The idea sufficient extra apparatus so that at "The new socket power B unit em- no time would it be necessary for

Wave Length and Frequency To convert wave length in meters To obtain the best results with to frequency in kilocycles is not as resistance-coupled amplification there difficult as generally supposed. If recently has been developed a vari- the value in wave length is known able resistor with a range from 1-20 the frequency value may be deterto 2 megohms resistance, known as mined by dividing 300,000 by the wave the Cunningham variable resistor. It length in meters. The result will be is a well known fact that vacuum the frequency in kilocycles. If the tubes vary, and to compensate for frequency is known the process may this and to obtain the utmost in vol- be reversed for computing the wave ume and clarity of tone it is neces- length in meters. The value obtained sary to vary the resistance used. is only approximate but is accurate This variable resistor will fit be- enough for rough computations. If FARMILL RADIO CO., 62 Cortlandt St

#### An Ultra Short-Wave Transmitter



Winfield Salisbury, a senior in the Physics Department of the University of Iowa, has designed a CW radio transmitter which is considered the shortest wave-length apparatus ever used by an amateur. The transmitter is shown in the above picture. In laboratory tests it was operated on a wave length of but seventy-

### Small-Primary Coils

By Theodore R. Bunting Research Engineer, Sleeper Radio Corporation

The use of the term "semi aperiodic" to describe the nature of he small antenna primaries emand the manner in which he solved it. From WJZ on Thanksgiving is incorrect, there being no technical ployed on many types of tuning coils

tion in the morning, which can be sing such high resistance in its com-

anything in Radio and Always the Be

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four centimeters in length. Use of Multi-Wire Aerials

A radio receiving antenna for Are Not Semi-Aperiodic broadcast reception need not have nore than one wire. Two or more wires will tend to increase the capacity of the antenna system which, in turn, will tend to make the receiver less selective.

#### 'Rigoletto' in Tabloid Form By WEAF Grand Opera Co.

The WEAF Grand Opera Company, under the direction of Cesare Sodero. will broadcast a tabloid production of the grand opera "Rigoletto" from WEAF, WOO, WCAE, WJAR, WCAP and WTAG, beginning at 10 p.m. The roles will be taken as follows: Gilda. by Genia Zielinska, and the beautiful and famous quartet by Ferruccio Corredetti, barytone; Grace Leslie, contralto, and Guiseppe di Benedetto,

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wires in surges or waves, first in one direction and then in the other.

"Radio operation demands a smooth, even electric current. Therefore, to make ordinary house current suitable by all members of the fame attended by all members of the family before the house of changing alternating current that would be practical for use in the home.

"This change in the current—technically called "rectification—may be brought about by a vacuum tube rectifier or an electrolytic rectifier. Either may operate on the half wave or the full wave principle.

"A half-wave rectifier acts like a check valve, simply suppressing all the half-waves of current tending to flow in one direction and letting flow all the half-waves or surges in the other direction. The surges which are permitted to flow are separated from flowing.

"A full-wave rectifier in its best form does not suppress any current, but rather directs both the halves of the wares into a common output circuit," so that there is a continuous flow of direct current without only open-circuit gaps.

"A full-wave rectifier in its best form does not suppress any current, but rather directs both the halves of the family of Prench instrumental from and soprano soloist. In addition, there will be presented for the direction. The surges which have been prevented from flowing.

"A full-wave rectifier in its best form does not suppress any current, but rather directs both the halves of the family of Prench instrumental from any open-circuit gaps.

"A full-wave rectifier acts like a check valve, simply suppressing all the half-waves which have been prevented from flowing.

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STANDARD TRADING CO.. OMNIGRAPH, model 5, 2 extra dials, new Federal buzzer, new battery, all mounted ready for use; sent express baid for \$25. P. H. JAQUITH, 133 Westbourne Parkway, Hartford, Conn. Commercial Bankers, 491-493 Broadway. Canal 7849-7856.

# Four Types of Amplifier Arrangements for Wagnifying Radio Signals

The Author Says All Systems Should Be Tried When in Doubt as to Which Is Best

By ROBERT HERTZBERG

HE adoption to broadcast reception of certain types of audio amplifiers which heretofore have existed only in a few laboratories and in engineering textbooks has been of material advantage in the attainment of clear reproduction of voice and music; but it has also served to bring about a general confusion of the circuits themselves, of the apparatus used in them and of the designations applied to the systems and their components. The perennial transformer amplifier has never caused much trouble, but with resistance amplifiers, choke coil amplifiers, impedance amplifiers and auto-transformer amplifiers now commanding a good deal of public respect, the untechnical experimenter not infrequently tangles himself in a maze of diagrams and instruments that appear deceptively alike in outline, but are actually considerably unlike in construction and

An excellent example of this confusion centers around the auto-transformer and choke coil types of circuits. The hook-ups are identical except for the difference that the choke coils have two connections on them and the auto-transformers have three. This is a slight variation, which radio fans are prone to dismiss as the work of some prolific circuit-changing "bug," but actually it marks the difference between two circuits that are entirely unlike in electrical operation.

#### Four Amplifier Arrangements

There is a total of four audio amplifier arrangements if the mechanical features of the group are compared, and only two systems if the fundamental theories of operation are considered. This may sound strange to the fan who reads the radio publications and recalls the diversity of circuits he has seen in them, but it is the unquestionable technical truth.

The quartet comprises the transformer coupled amplifier, the resistance coupled, the choke coil and the auto-transformer. The omission of the "impedance" type is not an error, for the terms "choke coil" and "impedance," when applied to audio amplifiers, are synonymous and indicate the same instrument. "Impedance" is a characteristic of certain electrical devices. so the term "choke coil," designating the tangible apparatus used in the circuit, is

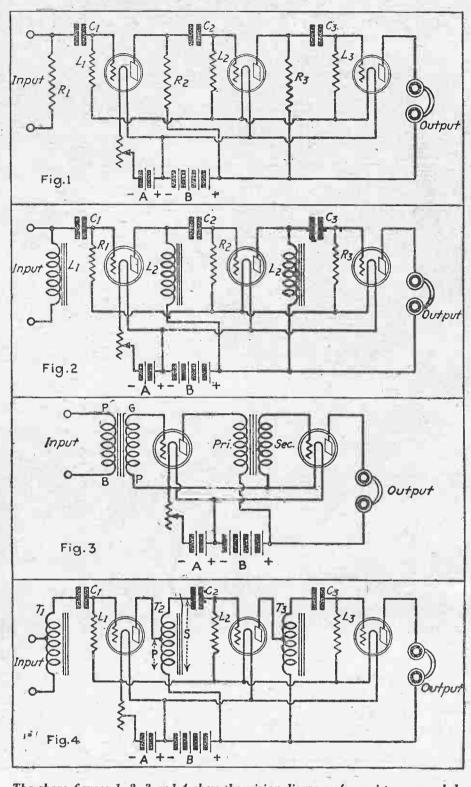
The transformer amplifier, as it has been employed for many years, falls in the same category as the auto-transformer amplifier, and, despite some evident differences in their wiring diagrams, the two work in exactly the same fashion. The auto-transformer system is frequently and entirely erroneously referred to as a "choke coil" or impedance system, even by people who ought to know better, but it is | ever, the voltage transformers, as they not anything like the choke coil.

Similarly, the resistance and the choke coil amplifiers fall into a second class and also perform in a like thoretical manner. Theory of Transformer Amplifier

The theoretical action of the transformer amplifier is fairly well known, as it involves a rather basic principle of electricity. The current flowing from the detector tube of a set into the primary of the transformer sets up a fluctuating magnetic field in the iron core of the instrument, and the magnetic field in turn generates a current of electricity in the secondary winding, which is wound on the same core and which is therefore susceptible to the magnetic impulses.

The electrical voltage or pressure developed across the secondary depends directly on the ratio of the number of turns in the primary coil to the turns in the secondary coil. The ratio may be anywhere from 2.1 to 6.1 in standard transformers, which means that the transformers bring about an increase in the voltage from two to six times its original value. The vacuum tube is a voltage operated device, so the transformer is responsible for a decided amplification of the original radio signal as represented by the voltage fed the input of the amplifier system.

The usual transformer amplifier consists of two transformers, two tubes and



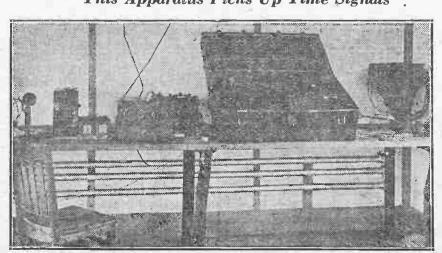
The above figures 1, 2, 3 and 4 show the wiring diagrams for resistance coupled. choke coil, transformer and auto-transformer coupled amplifiers respectively

The auto-transformer amplifier, pictured diagrammatically in Figure 4, operates on exactly the same principle of voltage stepup by virtue of turns ratio. Here, howtruly are, are not constructed with separate primary and secondary windings, a step-up in voltage is invoked by difas parts of the secondaries. Actually the auto-transformer consists of a single straight coil of wire, wound on an iron core, with two connections leading from the ends of the wire and a third from some predetermined turn somewhere in

the associated incidentals, as shown in always be distinguished from choke coils because they unfailingly are equipped with three binding posts, while the chokes have only two. Likewise they need not be confused with straight transformers, because the latter have four terminals.

Step-Up Voltage As with the double winding transformer, but instead have the primaries arranged ference in size between the primary and secondary coils. The current flowing through the "P" section of T2 of Figure 4 sets up a fluctuating magnetic field around the whole coil, and a voltage is induced across the entire winding. The secondary voltage, as measured across the extreme the winding. Auto-transformers can ends of the coil, depends on the ratio that

#### This Apparatus Picks Up Time Signals



The semi-automatic medium wave receiver and amplifier at Station WBZ, Springfield, Mass., which is used twice daily to receive for rebroadcasting on 333 3-10 meters the time signals sent out by the U.S. Navy Station, NAA

exists between the whole coil and the section from where to the tan is taken down to the lower terminal.

The grid condensers, C1, C2 and C3, of the auto-transformer amplifier are necessarv to keep the high voltage of the B battery off the grids of the tubes, where it otherwise would completely paralyze the bulbs. These condensers block the direct current of the battery, but they offer little resistance to the fluctuating currents that carry the sound of the amplified voice or music. The grid leaks, L1, L2 and L3, are required to prevent the condensers from being blocked by a peculiar building-up action of the grid circuits.

If the primary taps of the auto-transformer are moved up to the tops of coil, the auto-transformers will become choke coils and the circuit will develop into that of Figure 2. However, the transformers will then cease to be transformers and will not increase the voltage appreciably, if

The amplification per stage afforded by this type of amplifier is equivalent only to the amplification constant of the tube the actual figure varying between seven for the 201A tubes and forty for some of the special bulbs designed for this particular

#### Purpose of Choke Coils

The choke coils (L1, L2 and L3, Fig. 2) serve merely to deliver the varying output of one tube to the input of the next: or, in other words, to impress the effect of the varying voltages across them onto the grids of the succeeding bulbs. The variations that take place across the chokes are the amplified reproductions of the weak currents carrying the sound impulses, and exist by virtue of a complicated tube phenomenon, which the radio fan need not investigate. The action of the tube is such that, although the voltage or electrical pressure existing across the choke coils fluctuates in direct accordance with the voice modulations, the actual amount of current flowing in the plate circuits, and therefore through the chokes. remains constant. The test of a choke coil amplifier is, in fact, the ability of a plate milliammeter to remain unchanged in needle reading, while the amplifier is functioning with a normal receiving set.

Resistance-coupled amplifiers operate in practically the same theoretical fashion. For purposes of obtaining the amplified signal in the plate circuit of one amplifier tube and of transferring it to the grid circuit of the next tube, the device in the plate circuit may be any high "impedance," and both choke coils and simple resistances give exactly the same effect. As far as actual results at the loud speaker are concerned; there is little choice between the two classes of devices. providing the individual chokes and resistances selected for comparison are of equivalent quality.

#### Advantage of Choke Coils

The choke coil arrangement possesses one indisputable advantage over the resistance in that it is capable of operating perfectly with an ordinary 90-volt B battery, while the resistance systems all require at least 135 volts. This situation exists because the choke coils themselves have a comparatively low ohmic resistance and no great amount of B battery pressure is necessary to push a weak current through them, whereas a considerable drop in voltage occurs across the straight resistances. The actual battery consumptions are about the same, though, the resistance amplifier merely requiring more initial voltage to obtain the current through its coupling units.

The writer deems it irrelevant to express an opinion on the respective merits of the aforementioned four-amplifier systems, and wishes only to have a few simple facts about the circuits themselves understood by radio fans. Each system has its defenders and enemies, who are always ready to point out some inconsistency in each other's statements. If you are in doubt as to which is the elusive "best" amplifier, try them all and let your own ear judge for itself.

#### News and Notes of the Radio Trade

Promotion in Boston Office

De Forest Cuts Tube Prices

Forest radio receiving tubes as a

result of specialized manufacturing

processes, increased production and

greater sales were announced last

week by the De Forest Radio Com-

Retail price reductions on all De

Power From Lighting Current | able by turning a small knurled After nearly two years of intensive screw. It can also be used across the research and experimenting with ap- secondary of the first audio transparatus designed to eliminate the A former to clear up noise in the set. and B batteries of a radio receiving The Cunningham variable resistor is set, Walter E. Holland, chief research | manufactured by the R. P. Cunningengineer of the Philadelphia Storage ham Electric Company, 319 North Battery Company, announces the per | Whipple Street, Chicago. fection of units that successfully operate a receiver on current from an electric light socket.

The A and B units, according to three years manager of the merchan-Mr. Holland, may be plugged into a dising sales department in the Boslamp or wall socket as one would ton office of the Westinghouse Elecplug in a vacuum cleaner or other tric and Manufacturing Company, household appliance. The units are has just been appointed manager of built into one case for dry-cell tube the receiver section in the Westingsets and in separate cases for storage house radio department with headbattery tube sets. One switch con- quarters in New York. trols both A and B.

The B unit eliminates both storage and dry B batteries. Unlike the first oughly trained in the electrical field eliminators developed, the new unit is safe to use and free of any ob- Thomas A. Edison, Inc., the Edison jectionable hum or distortion. Ac- Illuminating Company of Boston and cording to Mr. Holland, the unit will the American Ironing Machine Comdeliver enough power to operate a pany of Chicago. number of large tubes and yet will not | The appointment became effective give too much voltage to shorten the at once, and Mr. Hillier assumed the life of small tubes.

duties of his new office December 1. The A socket power unit supplies | He will be responsible for all busipower equal to storage battery cur- ness of the receiver section of the rent for sets having storage battery radio department, and will be located tubes. For sets employing three-volt at 150 Broadway, New York. tubes, Mr. Holland has designed a combination A-B unit with a single switch control.

Since radio became popular fans have been wondering why some means could not be perfected whereby their sets could be powered by house current. Many fans do not understand the difficulties encountered by the engineers who have worked on this problem. But Mr. Holland explained the problem which confronted him Entertainment All Day Long and the manner in which he solved it. "Storage batteries," he said, "deliver smooth direct current—that is,

current that flows in one direction audience on Thanksgiving. Inasmuch wires from an electric generator is in almost all cases alternating cur- fans a few more things to be thank-

"Now, after rectifying the alter- the radio audience an English parson, nating current so that it flows in one known as the Rev. Peter Kiljoy, and direction as direct current, it is still also one of his leading roles as unfit for radio use and will produce Cardinal Wolsey. only a hum or noise, due to the fact Difference Between Class A type of direct current. The ripple must be smoothed out. This is done by a combination of choke coils and A and Class B broadcasting stations fixed condensers, known as a filter has dwindled till there is practically

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The primary circuit can be and without fluctuations. On the other as the day is one of rest, recreation "periodic" or "aperiodic," but there hand, the current delivered to house and thanks for the blessings we have is no half way condition. A received, WJZ will give the listening "periodic" circuit is one capable of rent current that flows through the ful for. The schedule for the day oscillating when properly excited, but wires in surges or waves, first in one includes a period of religious devo- an "aperiodic" circuit is one posses-

flow of direct current without any open-circuit gaps.

making his first visit to America. Mr. hear little if any broadcasting.

Dickson-Kenwin will impersonate for

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### New Chain of Stations To Be Installed on Pacific Brandes

find that the detector gives no reweight and avoid confusion in observing the wave motion. This model was sponse when the system is adjusted set up especially to study the twist- for different velocities of propagation, ing of the plane of polarization and whereas, it gives a maximum response the experiment has strikingly con- when the system is adjusted for equal the experiment has strikingly confirmed the theory which it was intended to illustrate. This theory is plance. The phenomena of fading have thus been reproduced mechanically briefly the following: through polarization in a single wave

Mechanical Model We will assume that the medium through which the radio waves pass mechanical equivalent is sufficient to has such characteristics that the explain the fading in actual radio ly polarized wave differs slightly from for what it may be worth as a help the velocity of the propagation for a to interpret the many observations in horizontally polarized wave. It is not actual radio transmission which are necessary for the present purpose to try to explain the reason for this difference in velocity. We may assume that the reason for it is due to Why SOS Signals the electrostatic and magnetic effects, to the retarding effect of the velocity of the vertically polarized wave passing close to the earth, or, on the other hand, due to properties of free electrons in the upper atmosphere. Whatever the cause may be, we may assume that such a difference of velocity from some ship in mid-ocean in a exists and the mechanical model has crippled condition. As a result a been constructed so as to reproduce number of radio fans, not realizing such conditions. The weights on both the importance of such signals, combands. Wave motion in the horizontal plained about the lack of programs or vertical planes can thus be studied while the distress signal reigned over independently, and these two wave the ether. motions may be adjusted for different The international regulations govvelocities. A wave started in the erning the transmission of wireless vertical plane maintains itself ver- signals clearly state that while distically and a wave started horizontal- tress signals are being transmitted ly maintains itself horizontally. If, all stations, whether they are broadhowever, a wave is started in a plane casters, commercial, ship or land sta-45 degrees between the vertical and tions, must cease with the exception

the horizontal, it is found that the of those taking part in the rescue wave motion proceeding therefrom work. This includes public correassumes the shape of a corkscrew. The straight line oscillation of the The wave length used for transmission of such signals is 600 meters. first weight is passed along as an Therefore it is easy to see that if eliptical motion which gradually broadcasting stations were allowed widens into a circle. Then this circle narrows down again to an elipse to continue their programs it would Therdarson and finally a straight line at right possibly result in interference to the important signals, inasmuch as the angles to the original line of oscillabroadcasting range is between 200 tion. This is exactly in accordance and 550 meters. Distress signals have with the theory. The point where the precedence over all other classes of wave has shifted its plane of polari-

Deserve Respect

Several times during the last two

zation 90 degrees is the point where messages. In every case of a sea disaster the faster of the two waves is half a wave length ahead of the slower wave. strated its extreme value to ship navwireless communication has demon-From this point on the wave proceeds igation. Take for example the rerepeat this peculiar corkscrew cent steamer Lenape. Although little was said about the important part The fact that the twisting of the radio played in the episode, the wave is due to different velocities in writer was enabled to listen to the the two planes of polarization can entire correspondence which took also be demonstrated by this model. place between the various ships and For this purpose the rubber bands land stations valich aided her. The are added to the counterweights. The effect of this is to change the the Lenape, was on continuous duty velocity of propagation in the verti- and his broad spark transmitter was cal plane, whereas, the velocity in the to be heard almost constantly while horizontal plane has not been affected the disabled vessel was limping to

vertical motion is Delaware Bay transmitted to the counterweights The above is only one exampleby the suspension yokes. The sys- there are hundreds that might be tem can thus be adjusted so that the enumerated. Probably the most imvelocities in the horizontal and the portant of these was the sinking of vertical planes are exactly equal. the steamer Republic, the first ship After this has been done it is found ever to transmit a signal of distress that the tendency to corkscrew by means of radio. motion disappears and the wave re-

It may be said that radio literally

mains strictly in the plane in which has saved thousands of lives. It in-

t has been started.

easily be explained.

were not known from the classical

Aids to Explaining Fading

sures to ocean travelers more safety While this mechanical experiment and it keeps ocean going ships in does not bring out any new facts that constant communication with land. Years ago when a vessel cleared theory of wave motion, it helps us to port it was not to be heard from visualize the main phenomena in the radio wave propagation which we are trying to explain. The phenomenon

tination. of a constantly shifting plane of With these facts in mind, the radio polarization which we discovered experimentally in tests between the fallacy of complaining about broadcast listeners may easily see broadcast programs ceasing because some ship at sea is in distress. Saving of life is far more important This conception of the wave motion than an hour or two of entertains also a help in explaining the ment. phenomena of fading. There is

already much experimental evidence U. S. Army Band Concert

that fading is a phenomenon of in- Direct From Army Barracks terference. In other words, the A concert by the United States fading is due to the fact that the Army Band, under the direction of radio waves arrive at a certain point | Captain William J. Stannard, will be through two paths. The waves will broadcast by WEAF, WCAP and sometimes add to each other and WJAR direct from the Army Barracks, sometimes neutralize each other. If Washington, at 7:30 p. m. on we keep in mind the observations on Wednesday.

# I have a mechanical model, made the mechanical model that the waves up for studying wave polarization in the General Electric laboratory. The model consists of weights suspended in such a way that they are free to move in all directions. Twenty-two model consists of weights suspended in such a way that they are free to move in all directions. Twenty-two of these weights are arranged in a row and connected together by rubber bands. Each weight is suspended from a yoke and an equal weight hung on the other side of the yoke to serve as a counterweight. A screen is set up so as to hide the counter.



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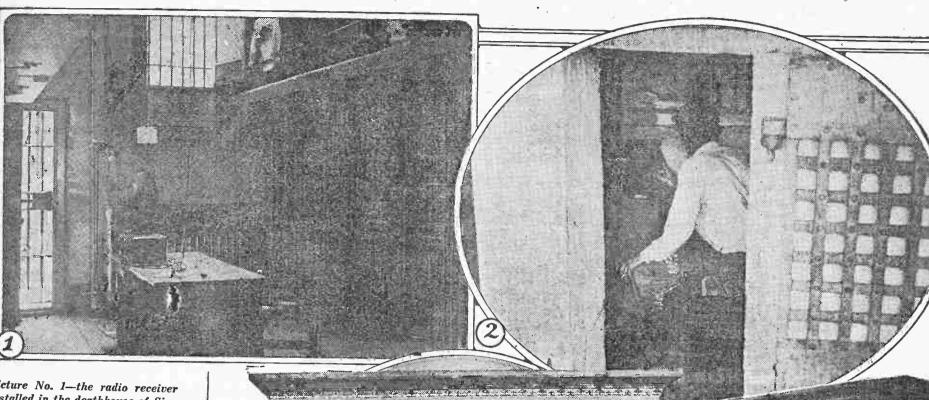
Danied Grimmes Freed Eisemann Thorola — Ambassador Sleeper — Scientific American Wireless Console

Santa Claus Says GIVE HIM A BRACH SHOCK Radio Plug

# Radio Plays an Important Part in the Life of Prisoners at Sing Sing

Officials Provide Loud Speaker for Deathhouse Inmates; Other Convicts Have Their Own Sets

By WALTER J. FENTON



Picture No. 1—the radio receiver installed in the deathhouse of Sing Sing. Picture No. 2-A prisoner in his cell listening to radio concerts with his home-made radio set

EYOND the stone walls of Sing Sing prison, penetrating even the forced seclusion of the death house, musical programs, some presented in distant cities, find their way each evening by way of the radio. This modern invention has been added to the few privileges afforded these convicts by Warden Lewis E. Lawes.

In the death house there are at present fourteen men and one lone woman awaiting the arrival of the time set by law for the payment with their lives for their offenses to society. To this small group the radio is indeed a godsend. With the comparatively few privileges afforded them, the reception of radio programs has added much to their comfort. In its construction, the new death house

at Sing Sing could be described as a huge wheel with the spokes forming the various corridors and the hub, the cage for the reception of visitors. Visitors are limited to relatives of the condemned, and their visits are restricted to one call a week except on official order from the court. In a few cases are court orders granted for such a purpose. The men are confined throughout the day to their cells. Conversation between those in the

death house is permitted. Reading matter is provided and when the prisoner has pair of headphones to be extended to the smoking material. Except for a half hour each morning, when they are taken into the exercise court, these prisoners must remain in the small cells.

Other prisoners have more things to cccupy themselves. They have their daily tasks they have entertainment provided at stated periods by the Mutual Welfare League, and in some instances are granted even greater exercise periods. However, throughout the entire prison it is a set rule that all must be behind the barred doors before 10 o'clock each evening.

There is no rule which compels a prisoner to attend the various entertainments provided, and some choose to remain in the solitude of their cells, some to study, some to smoke and some to tune in on their own radio receiving sets for the purpose of selecting their own amusement from the air.

Fifty Sets in the Prison

Throughout the prison there are about fifty individual receiving sets. To those prisoners with the necessary finance permission is given to purchase receiving sets. These sets range from the small one bulb set to the more modern sets of greater capacity. In each case the reception is absolutely restriced to headphones. There are also those prisoners whose the loud speaker on special occasions is financial standing does not permit the purchase of a set but whose interest in | The programs are thus placed in any part | provide courses in numerous subjects pre-

with the set is willing to provide an extra | from the outside.

In addition to the individual sets there is a set maintained by the authorities for use on special occasions, when all prisoners in good standing, according to the institution's manner of calculating, may they were received at the office of the listen in. Then there is another set for those inmates of the death house. This set is located in a central position and is regulated by an official who selects the programs for his charges. But in the death house the use of earphones is not permitted the individual prisoner. It is a tedious task for the gaurds to watch everything that enters the cell of the condemned in an effort to prevent the prisoner's cheating the law's sentence.

Musical programs play a big part in the radio reception for these unfortunates. Sometimes a program from Manhattan is chosen for their amusement, and again it may be a program from a more distant city, but in every case the program is first passed on by the official in charge of the radio apparatus.

#### Equipment Used

The principal radio equipment at Sing Sing is a Western Electric superheterodyne with a power amplifier. The set itself remains in the huge cabinet, but carried about to all parts of the prison.

these it is generally found that the man | thus overcoming the dangling of a wire

Picture No. 3-A close-up of radio receiving equipment used at Sing Sing for the entertainment of the prisoners. Pic-

ture No. 4-A trustee tuning the radio receiver shown in Picture No. 3.

sufficient funds he may secure for himself | adjoining cell for the edification of his | interest to prisoners. Sometimes the re-Politics are sometimes of considerable sults bring hopes for reprisals and sometimes they bring additional sorrows for these men. In days gone by it was the custom at Sing Sing to provide bulletins on the progress of the elections after warden. During the recent mayoralty contest in New York City it was the privilege of the deserving to listen with their own ears to the returns as sent from the broadcasting stations in the heart of the city. This was the first time in the history of the penal institution when such an innovation was permitted.

With the completion of a day's toil some of the prisoners turn to other thoughts, some to the study of various subjects, some to the entertainments provided by the Mutual Welware League and others to the radio sets. To the man sentenced to spend the balance of his natural life behind barred doors the radio, perhaps in some cases, offers the only means of keeping abreast with the outside world. The "long termers" and "lifers" are the real beneficiaries of the radio reception at Sing Sing. To them it means just a little more than an evening's entertainment. It means a knowledge of what the world is doing and thinking, for in the present day the broadcast stations offer not only musical programs, lectures and vocal selections, but some go even further and the programs of the air is just as intense of the prison selected by the authorities pared by some of the leading colleges and

as their more fortunate comrades. For | The set is equipped with a loop aerial, | universities. All these things mean much to those confined behind the bars.

That is but one side of the radio reception at Sing Sing. Picture the man who has sinned against society and has been sentenced to spend a number of years behind these barred doors. Perhaps he had a family, perhaps a mother, or at least a sweetheart. Sometimes in his life he undoubtedly had a favorite song enjoyed most when in the company of that loved one. Now here he is barred from the world with only his guards and others who have violated the law for companions. Through the air comes a program of old songs which bring back fond memories and thoughts of the days when he will again be with those he loved.

The radio undoubtedly comes in for its greatest usage during the holiday season. With the passing of Thanksgiving and the approach of the yuletide season, some of the prisoners are again looking forward to the reception of programs on Christmas Eve, which, in the days before their straying from the straight and narrow path, meant something of joy and happiness, but now means nothing more than a day nearer to freedom and liberty. They are looking forward to those radio pregrams which will instill in their minds the joys of leading a straight life and the happiness to be attained therefrom.

As only relatives are permitted to visit the inmates of the death house, and then on stated days, it is difficult to learn what programs are enjoyed most by these ur

(Continued on page seven)

### A New Chain of Short-Wave Commercial Stations to Be Installed on Pacific Coast

Engineers Find That 40-Meter Transmitters Using Polarized Waves Are Successful

By E. F. W. ALEXANDERSON Chief Radio Consulting Engineer, General Electric Company

middle through a transmission line.

3. The series tuned horizontal loop.

All these three radiators have one

feature in common, that the radiation is

projected at a high angle upward. They

may, therefore, all be classified as high

only the high angle radiation is useful in

reaching great distances. The high angle

radiator has, therefore, the double advan-

tage of economy of energy and the absence

of objectionable signal strength in the

The first type of antenna radiates a ver-

tically polarized wave of the same general

character as the waves that have been

neighborhood of the station.

ADIO development has during the | last year entered into Until recently most efforts were devoted to apparatus in the sending and the receiving ends. In this respect the radio technique has already reached a high degree of perfection. The milestones in this development have been the introduction of continuous wave transmission and reception and of radio telephony for broadcasting.

Thus a large industry has grown up, making practical use of wave propagation through space, a phenomenon of nature which was very little understood. About two years ago the Radio Corporation and associated companies decided to make a determined effort to shed new knowledge on this subject, upon which the further growth of radio depends.

One of the first results of this effort to explore the phenomena of wave propagation led to the discovery of horizontally polarized radiation. Since these discoveries were first announced the subject of wave polarization has been brought into the limelight and is receiving much attention from radio investigators, amateurs as well as professionals. A wave of optimism has swept over the radio fraternity and brings forth new reports of success in the struggle against the old enemies of radio-static and fading.

#### Two Methods of Testing

The study of wave propagation over large distances requires a comprehensive organized effort. To this end the General Electric Company undertook to do the technical pioneer work in devising new forms of radiators and receivers, whereas the Radio Corporation undertook to judge the practical value of this new development by making use of it in its communication system. It has become a tradition among radio communication engineers to accept the judgment of traffic operators

radio circuit. The reason for this is that

the facts in regard to radio communica-

tion are not simple, measurable phe-

nomena, such as we are accustomed to in

One of the important steps in explora-

tion of short waves was taken when the

Radio Corporation of America installed

in a temporary manner six short-wave

transmitters in its commercial long-wave

stations to be used as supplements to the

regular service. These transmitters were.

to begin with, operated in the neighbor-

hood of 100 meters. Similar transmitters

were installed by the associated European

companies. The first impression from this

new service was that the short-wave trans-

mitters gave remarkably good communi- | 2. The horizontal antenna with an over- | conditions of wave polarization. His findcation at certain times during the hours all dimension of one-half wave fed in the of darkness, whereas in davtime the service was totally unreliable, if any signals could be heard at all. Some of these transmitters were kept in regular service, whereas others were modified in order to explore rossibilities of improved results. Thus it was found that when the wave angle radiators. It has been found that length was below fifty meters the night signals became weaker; but, on the other hand, service could be given during daylight hours. Tests with still greater reduction of wave lengths of a range between fifteen and thirty meters proved that it was often impossible to give good service across the Atlantic Ocean at midday in the summer. The stations which are giving the best all-around service at the present time operate at a wave length of about forty meters.

#### New Chain of Stations

So favorable have these results been that the Radio Corporation is now installing a chain of short-wave stations to cover the Pacific Ocean, supplementing the two long-wave transmitters at the Hawaiian Islands. This new chain of stations will include the Philippine Islands. The conditions for wave propagation over the Pacific Ocean are notably different from those on the Atlantic Ocean, and as a whole easier. It is, therefore, confidently expected that a good short-wave service will be established over the Pacific. The findings on the Atlantic circuit in regard to wave length will not necessarily apply to the Pacific, and the stations will be built in such a way that the best operating conditions can be determined experimentally. It is, however, possible to make a reasonable forecast of expectations based which is already on hand and which is rapidly accumulating.

The experimental station built by the General Electric Company in Schenectady for the purpose of exploring these pos-

seven transmitters simultaneously with

different wave lengths and different types

of radiators, and observations from these

transmission tests are being made all over

partly to explore the propagation charac-

teristics of different wave lengths and

partly to make final tests of comparison

between various types of radiators. Three

types of radiators are used in these com-

parisons, but these are the result of a sift-

ing process conducted on a smaller scale

in which a great many other antenna sys-

tems have been explored and at least tem-

porarily discarded. The radiators which

1. The straight vertical antenna oscil-

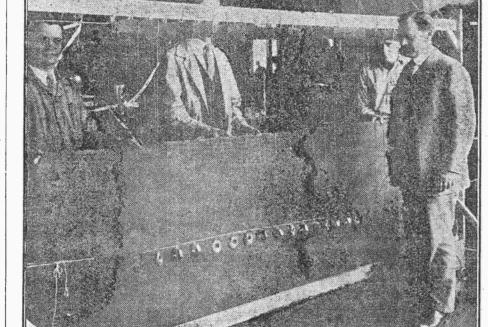
are now being compared are:

leting at a harmonic frequency.

The writer demonstrating that a wave started in a plane 45 degrees between the

as final in valuation of the quality of a , sibilities is now capable of operating with

most other engineering arts, but are the world. The object of these tests is



A model consisting of twenty-two weights connected with rubber bands which the

used heretofore in long and intermediate | brought out many peculiarities which yet wave stations. It differs from the old type of radiation only by being a pure high angle radiator, whereas the old type of stations radiated a ground wave as well as | tor that the wave comes down with an

The second type of antenna, the halfwave doublet, is an intermediate form. At right angles to its length direction it radiates a horizontally polarized wave, and in its length direction is radiates a high angle vertically polarized wave. Thus in its length direction it has a radiation of the same character as that emitted from the vertical high angle radiator, whereas in the broadside directions it emits a wave of different type.

The third antenna system, the horizontal series tuned loop, emits a horizontally polarized radiation in all directions.

For the analysis of the characteristics of high angle radiation, we are particularly indebted to Commander A. Hoyt Taylor, of the Navy Department, who has made extensive tests and furnished valuable data on the so-called "skip" distance of the wave. He has found that the distance skipped by the wave, which means the length of the trajectory required for the high angle radiation to come down again to earth, depends upon the wave length, day and night conditions and summer and winter conditions, the general rule being that the shorter the wave the greater is the skip distance.

Measurements of Propagation The characteristic of the horizontally polarized waves has been explored in the neighborhood of the station in Schenectady up to about ten miles and also by measurements in the various stations of the Radio Corporation. For measurements at wave polarization at long distance we are indebted to Mr. Greenleaf Whittier Pickard, who during last summer and fall has made systematic tests of the radiation sent out from Schenectady, as well as generally explored the

have not been fully explained. So for example, it is found at a distance of about ten miles from the horizontal loop radiaalmost vertical direction of propagation. For those who believe in a reflecting Kenelly-Heavyside layer this would appear to be good evidence, because it might be assumed that the wave has been radiated straight up from the station and is reflected directly downwards. A loop receiver under those conditions gave no orientation of the station whatever, because the signals came in apparently equally strong from all directions when the loop was rotated around its vertical axis. This would indicate that the wave, besides being vertically propagated, was circularly polarized.

ings have been presented to the Institute

of Radio Engineers and it may be suf-

ficient to mention that he has shown that

component of polarization is usually twice

as strong and sometimes ten times as

strong as the vertical wave. He has also

shown that fading conditions are different

in the horizontal and the vertical plane.

Mr. Pickard has also shown that the

wave does not maintain its original plane

of polarization because the reception ap-

pears to be of the same nature regardless

of whether the wave is radiated with a

Explorations of wave polarization in

the neighborhood of the station here

horizontal or a vertical polarization.

in the short wave range the horizontal

Similar observations at a point only a few wave lengths distant from a horizontally radiating loop show that the wave comes down nearly vertically, but yet with a definite slant toward the station. Tests with a loop receiver gave in this case a distinct orientation, but the station appeared to be located at right angles from the direction where it really was.

#### Practical Conclusions

From the point of view of the practical radio engineer it is a satisfaction to be able to state that enough has been learned to create a new and promising field of radio communication, as evidenced by the decision of the Radio Corporation to proceed with its chain of short wave stations in the Pacific Ocean. The stations which will thus be built will have antenna systems of the type classified as short wave high angle radiators. Which one of the three types discussed above will be adopted will depend upon further results from the comparative tests that are now in progress and also upon final tests in the stations when installed. So far these tests have shown that the horizontally polarized radiation is superior to vertical radiation.

(Continued on page fourteen)

### WJZ's New Super-Power Station

Recent Tests Show That New Equipment Will Have a Daylight Range From 200 to 400 Miles; Programs To Be Transferred by Land Wire

N NOVEMBER 11 last, the new super-power broadcasting station of the Radio Corporation of America at Bound Brook, N. J., was first heard on the air under the call letters of WJZ. The programs were conducted for experimental purposes and were sent from the New York City studio over Western Union lines to Bound Brook and radiated from that point.

power installation to be supplied may be collected for broadcasting to with regular high-grade program ma- the American public. terial from a metropolis of the size It is expected that the station will of New York City and located so have a reliable night range, enabling near such a large city.

of approximately 50 kilowatts. Two Coast. complete transmitting sets are pro-vided, one of which is used for regular broadcasting, and the other for try that transcontinental reception short waves. Spare equipment is also will be possible. The station already provided for the main transmitting has been reported in San Diego, Calif. set, so that should any portion of It also is said that mail from numerit fail, a spare unit may be placed ous parts of Mexico has been rein service instantly. The two trans- ceived reporting the reception of the mitters require an input power of new super-power station.

broadcasting comprises a number fo erate on a wave length of 455 meters, 10 kilowatt water-cooled oscillator or a frequency of 660 kilocycles. tubes, with a large group of similar It is expected that the new station tubes functioning as modulators. The will begin to broadcast more or less incoming signals from New York regularly within the next few weeks. over wire lines, are amplified by means of five and fifty-watt balanced Range and Quality audio amplifiers.

The short wave transmitter is similar in design to the regular broadcasting transmitter, and will be used for special long range rebroadcasting experiments.

The regular transmitter is conmeeted to a type "T" cage aerial ber 9, is the call being sent out this having a flat top 220 feet long, and week by Amateur Station 2BMA, a cage lead-in 250 feet in length. located at 3149 Boulevard, Jersey 800-foot steel towers placed 700 feet City, the building of which has just This antenna is supported by two apart. The grounding system is located directly beneath the aerial, after a year of experimentation at a and consists of six radial overhead cost of approximately \$3,000,000. feeder wires which terminate in un- Mr. von Brandt announced that

The wires from the studio in New | Prompted by the reports of ama-York to the station are entirely in teurs in different parts of the coununderground and overhead cables, try and abroad, Mr. von Brandt anthus insuring maximum reliability. nounces that on Wednesday night They have been arranged to provide next he is desirous of establishing a undistorted transmission and low new record for both signal strength noise level (that is, silent in opera- and tone quality. His phone wave tion). The entire circuit consists of length on Wednesday night will be thirty-six miles of number 13 gauge 170 meters and his C. W. telegraphy paper cable, a number of pairs be- 40 or 80 meters. ing provided so that in case of breakdown of one of the circuits, others Christiansen in "Shanghaied will be available.

The main power supply for the stapower plants of the Public to be broadcast by Service Company of New Jersey so WFI, WCAE, WGR, WWJ, WOC. that if one of the sources of power WJAR, WCCO, WSAI, WEAR and

selected with the idea of giving a maximum amount of service with a listeners in the immediate locality.

This station is the first super- great number of splendid programs

it to reach all parts of the United The station is near the Raritan States east of the Mississippi River. River, about one and one-half miles It is also anticipated that the station from Bound Brook, N. J., and three frequently will be heard west of the miles from New Brunswick. It is Mississippi and on the west coast, connected by means of land wires although it must be remembered that to the studios and control rooms of there are four hours of time differ-Station WJZ, Æolian Hall, New ence between these two points, and York City. thirty-five miles away. | when WJZ "signs off" at 11 p. m. it The station has an antenna power will only be 8 p. m. on the Pacific

The station, which will use the The main transmitter used for well known call letters WJZ, will op-

### Test for Amateurs

quality test from 12 midnight until 3 a. m. on Wednesday night, Decembeen completed by W. C. von Brandt

derground "starfish" ground con- 2BMA is equipped for 2,000-watt pownection. The antenna is designed er, although the output is held to 500 and operated in a fashion which re- watts, since he is within five miles sults in exceedingly high radiation of a government station. Station efficiency and accounts for the ex- 2BMA, with a telephone, has three cellent transmission characteristics of systems of modulating voice: heising,

Out of 'Frisco in the '90s" The ever popular Eveready Hour,

supply fails the other may be put WTAG on Tuesday, beginning at 9 p. m., will be replete with thrills.

Preliminary tests of the station

p. m., will be replete with thrills.

The story, "Shanghaied Out of

recently have been extended through old "continued next week" stunt;

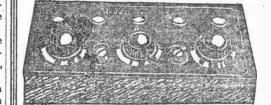
# To Be Put in Active Service FIRST TIME IN THE HISTORY OF RADIO AT THESE PRICES



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Both of these sets are 5 tube radio frequency. Genuine mahogany cabinet. Coast to coast reception. Highest grade parts.

A REAL SET IN EVERY SENSE OF THE WORD



**BABY GRAND** 

SALE PRICE

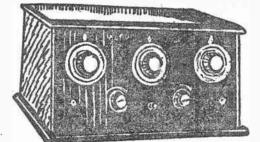
The Jewell is a 5 tube set-From the standpoint of quality, performance and appearance it cannot be duplicated for three times the money.

**OUR** 

**SALE** 

Complete

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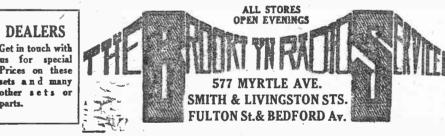


**JEWELL** 

LIST PRICE 39.50

TWO GUARANTEES—BROOKLYN RADIO

PACKED IN ORIGINAL



MAIL **ORDERS** Promptly attended to. Write 577 Myrtle Ave., Brooklyn, N. Y.



Only One Set

We Purchased from a Leading Manufacturer the

Entire Factory Output of These Wonderfully Built

NATIONAL, RADIO COMPANY

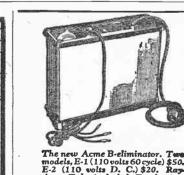
AT LAST! Here's the

opportunity you've long waited for! Now your Home will not be without a Radio for the Holidays! No matter

a Week

how little your savings are, you dor have to use your holiday money

buy this set. — Place a small down payment on it and it's



No hum and what's

THAT'S the story of the newAcme B-eliminator, Furthermore, it gives you greater volume. greater distance and an everlasting "B" supply at a current cost amountingtotheenormoussum of one cent for 6 "first row orchestra" hours. Acme Apparatus Co. Cambridge, Mass.

~ for amplification

have indicated that it will give satis- Frisco in the '90s," by H. P. Bailey, factory daylight service to cities will be presented in the usual within a 200 to 400 mile radius. It Eveready manner, and the narrative is said that reports have been re- itself will be given by Red Chrisceived from Washington, Baltimore, tiansen, who already has played a Philadelphia, Boston, Cleveland and prominent part in previous Eveready similar points of equal distances that programs. reliable daylight reception of the The incidents in the story to be station has been obtained. According broadcast will be highly colored by to reports, at night the station gives Mr. Christiansen's personality, and practically local service to those lo- will be the more realistic because in cated within a radius of 500 to 1,000 his experience he has been "shangmiles. In the New York metropolitan haied" and can therefore put considdistrict the station gives excellent erable of the personal element into service in all parts of the city and the broadcasting of this story. suburban districts, with few reports that the signals of the station are in- Reeve to Relate "The Radio conveniently powerful. The location Ghost" and Ask for Solution

The WOR schedule for Friday afternoon announces "The Radio minimum amount of interference to Ghost" to be broadcast by that master of detective fiction, Arthur B. Since the station is connected by Reeve, father of Craig Kennedy. In wire to the control room at Aeolian deference to the popular belief that Terms & as Low as Hall, in the center of New York City, every one enjoys taking a hand at unit is possible to broadcast from it raveling a mystery, Mr. Reeve will not only programs originating within relate "The Radio Ghost" with suitthis city but also those reaching the able accompaniment of whispers and control room over private wires to groans, no doubt, and then when Washington, Philadelphia, Pittsburgh, listeners are piqued to the utmost, Schenectady and Boston. These lines the noted author will perpetrate the

1853 BROADWAY at 61st ST.- TEL. COLUMBUS 2209 Utica, Syracuse, Rochester and Buf- that is, he will ask listeners to send BROOKLYN - CAPITOL RADIO CO. 1011 BEDFORD AVE. COR LAFAYETTE AVE.
NEWARK UNIVERSAL RADIO CO. - 236 HALSEY ST. falo. In this way it is said that a in solutions to the mystery. World Radio History

The fact that TRINITY SIX at \$50 gives the most yet offered in radio is easily proven. Just make your own comparison with other high grade sets, costing \$80 - \$90 - \$100 - or more.

TRINITY SIX costs you less because it costs Beacon less to build it. Most set manufacturers buy cabinets-Beacon

Most manufacturers buy panels-Beacon makes

Most manufacturers buy dials and other Bak-Most manufacturers buy condensers, rheostats,

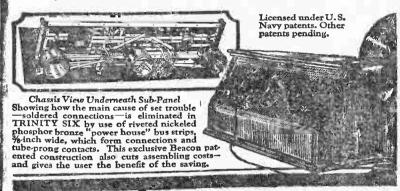
jacks, etc.-Beacon makes its own. TRINITY SIX is the first one-profit receiver. All in-between manufacturers' profits are

We repeat—TRINITY SIX in its large, handsome mahogany-finish cabinet at \$50 is the most yet offered in radio! You can prove t at the nearest TRINITY dealer.

Free booklet, "The Value Only Beacon Can Build," sent on request, gives description of exclusive Beacon construction, with full specifications.

Sold only by "Trinity" Dealers. Manufactured by

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**BRONX HEADQUARTERS** 

Sold on Convenient Terms M. Rappaport's Music Shop 880 Westchester Ave., Bronx.

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Improved Results with Tube or Crystal Try entirely at my risk the wonderful improvement this inexpensive little device will make in the reception of your set. Improves results on both crystal and tube sets that use any kind of acrise except loop antenna. Clears up reception

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Steinite 5-Tube \$2975 \$4 Postpoid If you are not set—delighted with results you get your dollar back

Put this interference eliminator on your set and note amazing improvement. No tools needed—install in a moments time. Connect with set and follow simple instructions. Money back promptly if not delighted, \$1.00 postpaid anywhere in U. S. when cash with order.

Beferences: Exchange National Bank, Atchison Savings Bank. Order today—a dollar bill will do.

STEINITE LABORATORIES. 127 Radio Bldg., ATCHISON, KANSAS

#### Beware of the Man Who Knows All **About Radio Sets**

By E. J. Craine Eagle Radio Company

Radio is full of romance and in the few years of its miraculous growth it has revealed some astonishing phases of human nature, and not the least of these is the pest who knowsall-about radio.

Whoever heard of a man going into a home where a new piano had been installed and announcing that he knew all about pianos and would remove a string or two, switch some of the bass wires up into the treble and perhaps file an inch off a peg here and there? Or, whoever heard of a man volunteering to take the new phonograph apart and drop a bit of solder on one of the connections? Neither a piano nor a phonograph arouses this small-boy desire to take it apart, but bring a new radio receiver into your home and immediately they see it a big percentage of your male guests will be seized with an apparently uncontrollable frenzy to build it over, and nothing short of absolute violence on your part will save it from some sort of recon-

Work of Radio Fiend

Invariably this radio fiend has "built any number of all kinds of sets," several of which are used by the most prominent people in the world. A close check-up on these "speciallybuilt sets" brings forth the information that they are "not working now"

or they "need an overhauling." This man who knows all about adio is so really a menace that at least one radio store in the city has printed warning which it has ipped into every receiver sold. One f the biggest department stores on the Atlantic Coast has trained its salesmen to impress upon customers the importance of guarding against the fixer.

"We will do everything in our power to see that you get satisfaction out of your radio, but we must warn you to keep it locked, and do not, under any inducement, be inveigled into letting any one experiment with t," the salesman reiterates.

A big percentage of the servicing of radio receivers is made necessary by this tribe of rebuilders. Crazy as it may seem, a set was returned for repair, and when taken out of the box it was found that the panel was cracked and a dial broken. "No one had touched the set," the man insisted, but the marks of some sort of wedge were so evident a child could tell what had happened. Finally the owner admitted that a friend whose business it was to do "all kinds of repair work" had wanted to see the inside, and instead of removing a New York City few screws, which were in plain sight, this "general repairer" deftly slipped a crowbar under the dial, and with one energetic heave ruined the

Happens in Best of Families Not long ago a set was installed by real radio man in one of the nice homes in Riverside Drive. Everything was connected as it should be, and the family were overjoyed at the perfect reception.

"Now, remember, keep your set ocked," the radio man warned. "Oh, no one will touch it," the man f the house was sure.

"I'll bet you a box of cigars, any brand you like, that in less than a week you'll have somebody who will want to change that radio set for

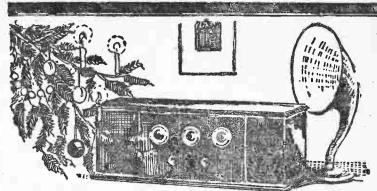
The man laughed, "All right, it's a

et, but you'll lose." That was Saturday afternoon at o'clock, and the set was duly locked against invasion. The family enjoyed the dinner music, the evening's programs, had a little dance after 11 and sat up until 3 o'clock receiving distance. They made up a very splendid log of stations received and were perfectly happy with the performance of their receiver.

A little after 2 the next day the man of the house called up the radio man and this is the gist of their conversation:

"Hello, you win! Can you come over and fix it?" said the man.

"What happened?" "Old friend of the family came in. Said he knew all about radio, had built sets for most of the Metropolitan stars. The set was working beautifully. I had to go out for a half hour and a friend of the wife's called her on the telephone. When I came in the chap said he'd cut the antenna, it was too long. The set's acting queer, like a lot of firecrackers; can you fix it? The cigars are waiting for vou-best Havanas."



#### When you remember your friend's hobbies

you come very close to their hearts, you prove that your gift goes beyond the ordinary limits and shows real understanding. For the radio enthusiast no gift is more welcome, more appropriate, or more needed than a set of

RADIO TUBES

Standard for all sets A type for every radio use C-11, C&CX-12, C&CX-301A, C-299, CX-299, C&CX-300, CX-112, CX-220, CX-310. Rectifier Tubes CX-313, CX-316B

In the Orange and Blue Carton SAN FRANCISCO

CHICAGO





### MICADONS

-the standard fixed condensers of radio—are made to meet and solve efficiently every radio condenser problem. They are made in accurate and permanent capacities and are found in 9 out of every 10 radio sets in use.

Guaranteed accurate within 10% of their marked capacity. Send 10c for 32-page booklet A-1, "Applications of Dubilier Condensers

in Radio Circuits". Address 4377 Bronx Blvd., New York.

**ADDITIONAL** RADIO NEWS AND **ADVERTISEMENTS** 

will be found in the

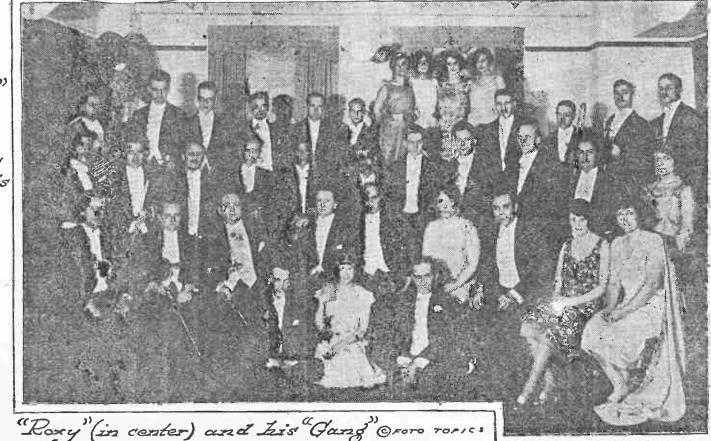
SECOND NEWS SECTION

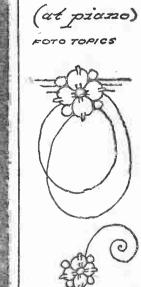
### Up-to-the-Minute News of Radio in Pictures



Telephone and electric light of ficials stand by while Arthur Williams broadcasts during Edison







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**TIMMONS** 

**B**Iiminator

The Timmons B-Liminator gives

vou smooth noiseless B current

from a source that is inexhaustible

-your electric light circuit 110

After severe tests, the B-Limi-

nator has been officially endorsed

by sixteen radio publications and

For sale by your dealer or

we'll tell you where you

volt 60 Cycle A C.

newspapers.

can buy one.

ecciving set. This was my first radio have been received at the General New Zealand, Hawaii, Alaska, New- England.

ike hearing Heaven almost, when for should live 100 years longer I'll never listeners residing beyond the terri- various sections of Central and South

torial boundaries of the United America. Reception also has been

ALLOCATING ALLOCATING

COMMENSER

Hear Those Fellows

Below 300 Meters

O you get the low wave

not, install Amsco Allocating

Condensers in place of your old

ones. The low Amsco mini-

mum capacity enables you to

"get down" to the low numbers.

After which, the Amsco

'spread" or allocation of the

stations, enables you to tune

themin, one at a time, with ease.

Made in six space-saving sizes—three Single, three Siamese—at réasonable prices. Ask your dealer.

AMSCO PRODUCTS, INC. Broome and Lafayette Streets, N.Y.C.

stations on your set? If

### Elementary Information for Radio Novices

### Radio Waves and the Receiving Circuit

By JAMES W. H. WEIR Technical Editor, The National Stockman and Farmer

This is the sixth of a series of lectures for the radio layman which is being broadcast through KDKA, the Westinghouse Electric and Manufacturing Company's station at East Pittsburgh, Pa.

N THE preceding lesson you made the acquaintance of an elementary radio transmitter. It produced a certain type of radio wave known in the parlance of radio as the "damped wave." The action of the condenser in the transmitting circuit is really to blame for this type of wave because the currents of electricity have a peculiar habit of darting from one side of the condenser to the other until they gradually die out. This dying out is termed "damping out." Naturally we can perceive that this action will be in evidence in the waves that these currents produce. The wave sets out very briskly and gradually fades out as another wave starts out upon the heels of the first. Each of these waves of course is but a fraction of a second in duration and many thousands of them occur in a full

Now there is another type of radio wave known as the "undamped wave." This wave is designated by the letters "CW," meaning continuous wave. It has no dying out or fading characteristic. These waves are produced by a special type of transmitting apparatus in which vacuum tubes play a prominent part.

We are now ready to investigate the methods by which these waves "damped" or "undamped" are captured and changed into intelligible sounds which we recognize as music and speech. Some of you doubtless believe that it is an extremely difficult task to capture something unseen and traveling at a speed of 186,000 miles

trap, however, known to us as the receiv- | You are also acquainted with the fact | path that it is permitted to travel over Often times this trap is too efficient and captures a lot of undesirable waves,

How is this trap or receiving circuit constructed? In the first place there's the aerial and ground, always essential to the simple type of receiving circuit, but gradually becoming excess baggage in the more modern and complicated circuits. In this latter type of circuit the well known "loop" becomes the substitute. Next. connected to the aerial we find a coil of wire or a tuning device so arranged as to permit the changing of the number of turns of wire in the coil. In radio this is termed the tuning inductance and it must be variable if the best results are to be obtained. Let me explain the reason for

on a windy day. Mr. Wind, coming along with great gusto, will not pass by without a call. The open window is his invitation, and in he comes. Had the window been closed he'd have passed right on by without a call. It is somewhat similar in the case of the radio wave. If the aerial is correctly tuned to the wave length, similar to that of the passing wave, the wave is bound to pay you a visit. Of course a stretch of wire hanging out on the roof can't change itself to suit every friendly wave that comes along, so you must help it adapt itself to the proper size to accommodate the different waves. Your assistance now comes in the form of an operation known as "tuning in." This is not difficult to do, and with your radio set merely consists of turning one or two dials so that the radio signal comes in louder and without intereference.

Suppose you leave your window open

Wave length, as you have learned from

along comes a wave of 300 meters. Isn't it only natural that the antenna and the receiving circuit combined should have 300 meters of wire or its equivalent in order to permit the 300-meter wave to pay a visit? Of course, but do not take this fact too literally, because we cannot always have the exact length of wire and must depend on other units in the circuit such as condensers to make up for the wire we are unable to supply. In other words, a combination of "capacity" and "inductance" permits you to make up the desired wave length. The condensers, by

the way, are variable, as is the "induc-

tance" or wire turns in the tuning device.

In tuning you may discover that you can perform the operation in two ways. One of these will permit only the desired wave to travel through the circuit to you. while the other will permit several waves to drop in at the same time. In the first case the tuning is said to be "sharp" and in the latter "broad." If you are tuned "sharp" to receive a 300-meter wave and a 350-meter wave comes along it won't bother you, for the 350-meter wave will pass right on by without stopping. If the tuning is "broad" the 350-meter wave and some of his brethren may deem it necessary to pay you a visit, and they all come piling in at once, giving you no end of trouble. Keep in mind here that a sharp tuning receiver is known as a "selective" receiver and it means that you will be able by manipulation of the tuning devices to limit the number of stations you hear

Well, to get back to our story. We now have the wave caged up in the aerial circuit. It is now in the form of a feeble current of electricity and it is running

ing circuit, it becomes comparatively easy. | that the meter equals 39.37 inches. Now is termed the "primary circuit" of the receiver. Now the problem is to make it

Let us look at the "secondary circuit"

of our receiver. As the feeble current in the "primary circuit" is an alternating one of very high frequency the secondary circuit, if it is tuned to respond to the 'primary circuit," will receive from it a similar current of electricity by means of 'induction." In other words the transfer of energy needs no metallic pathway to convey it from one circuit to the other. Now if we only had the headphones hooked into this secondary circuit the diaphragm of the receivers would vibrate at such a high frequency that we would hear nothing. Being human, you know, the vibration speed to which our ears responds is limited, and anything above the speed limit of vibration would not be recognized by us. Science has come to our assistance, however, and provided a little device that lowers the vibration or frequency of the current and conveys it to the headphones at a speed or frequency that we can interpret. It acts somewhat like a check valve, permitting the high frequency currents to travel without interruption in one direction, but positively forbidding a return passage. What is the result? An intermittent direct current flows into the phones with a frequency much reduced and therefore rendered

Next week before taking up the receiving circuit in detail we shall devote some space to the "continuous wave" and investigate the methods by which the voice is carried through the air. Thus far our study has merely been of radio signals such as the dot and dash. From now on the popular broadcast will be the primary previous articles, is measured in meters. around trying to get out. The complete thought in back of these articles.

#### Radio Entertainers years away from civilization it was success my first thrill. Even if I Electric broadcasting station from foundland, West Indies, Mexico and the first time I tuned in KOA the forget the experience." other night on my newly acquired | Innumerable communications also States. Included are residents of reported as far east as Birmingham, Do Not Fail Fans

Many and detailed have been the sneering epithets bestowed upon radio artists by their contemporaries of the legitimate and vaudeville stage since the early days of broadcasting, but within the last year one fact has given the microphonic performers cause for chuckles and the dramatic and vaudeville actors cause for deep thought. The one great hazard of all those who earn their bread and board in front of footlights-disability from accident and illness-has been reduced by 50 per cent among radio artists. Such trifles as broken legs and fractured arms cause no interruption in the income of the microphone stars, for so long as their throats and necks are left intact their "performance" remains uncurtailed. As a broken neck generally ends the need for an income, the radio artists are in a much less hazardous financial situation than are the treaders of the boards.

Disabled but Keeps Date Probably the most striking instance

of this advantage enjoyed by the broadcasters occurred recently, when Mr. Malcolm La Prade, conductor of a weekly travelogue feature at WJZ, broke his right arm less than twentyfour hours before his scheduled broadcast. Upon being told by the attending doctor that he could not possibly do any work for a few days, Mr. La Prade used his voice with considerable force and more length. The success with which he railed against the ironical dealings of Fate convinced him that though his arm might be, and was, swathed in a large size plaster cast his vocal organ was as unencumbered as ever. Whereupon he decided to keep his microphone date the next evening.

For half an hour he described the beauties of Berlin to his invisible audience, with more than occasional interludes wherein he directed his supporting orchestra with a free and slightly ungraceful-but thoroughly effective-left hand. No mention was made of his disabled arm, and the radio listeners found nothing

amiss with the broadcast. Other less spectacular instances are not rare in the still brief annals of metropolitan stations, where singers on crutches, speakers unable to stand up by themselves and, in one case, a cellist with a crushed foot. have fulfilled their radio bookings and given excellent performances. It is rather significant—and this is what has silenced many of the sneers from the vaudevillians and interpreters of the drama-that none of these "crippled" broadcasts was made in the days when radio artists received nothing more monetary than thanks for their work. Since the insurance companies have as yet made no change in their "disability" policies. the radio artists are beginning to appreciate the "invisible" factor in their work more than ever .-- S. H. H.

**Meeting of Government Club** 

By WEAF To-morrow A regular meeting of the Government Club will be broadcast by New York City, to-morrow beginning at 2:30. Mrs. George E. Owens will preside over the meeting.

How Radio Is Received in Far Distant Parts of Canada Suggestive of striking distances are three communications this week to KOA at Denver, from three widely

torical Hudson's Bay Company in northern Canada. One of these, written by D. McAlpine, who is detailed to duty north of the Arctic Circle, was mailed from Kittigaruit, which faces the Beaufort

separated staff members of the his-

"We are on the Mackenzie River delta, at a latitude of approximately 69 degrees 20 minutes, and heard your station to-night quite distinctly," the letter reads. "At the time this is written, August 26, there is hardly

any darkness at night." The second response, which was transported overland a distance of 300 miles to the nearest railroad, was sent by R. B. Urquhart, manager at Isle a la Crosse.

"On behalf of the Hudson's Bay staff at this post, kindly allow me to convey an appreciation for KOA's most enjoyable programs," the writer declares. "Volume and tone are most pronounced."

From the Sturgeon Lake post P. G. B. Bodeker writes: "To one who has spent twenty

E CONOM Y
MUSIC SHOP 112 West 23rd St. **NEW YORK CITY** 

Write for Special Proposition on this set

#### ...IMONS RADIO PRODUCTS CORE Germantown, Philadelphi TIMMONS RADIO Stan O

Guarantee

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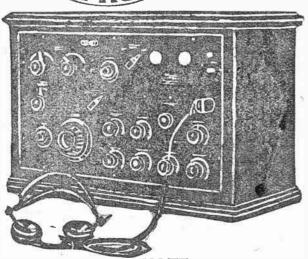
We hereby guarantee
Federal Standard Radio Products to be free from all mechanical and electrical defects, and to function property when installed in accordance with our authorized directions and we agree to replace at our expense, any unit or our expense, any unit or part which may prove defective.

ASTOUNDING BARGAIN A Real Christmas Buy

PRODUCTS

Model 61 6 TUBE

Advertised Standard RADIO Products \$223.00 PLEASE NOTE — THIS IS A 6 TUBE SET



The Federal is a ten million dollar (\$10,000,000)

corporation, and the Federal is one of the best

# THIS PRICE

Genuine mahogany cab. inet,  $16\frac{3}{4}$  high,  $24\frac{1}{4}$ wide, 123/8 deep; panels and dials genuine bake-

PACKED IN ORIGINAL SEALED **FACTORY CARTONS** 

Included in the purchase of this set we will give ABSOLUTELY FREE a \$7 Federal Head Set and an 80c Phone Plug.

The FEDERAL Type 61 may be used with equal effectiveness with a loop antenna, a small indoor wire or the more common large outdoor antenna systems, and when used with any of these types of signal system will give a range of reception of such magnitude as to make available almost all American and Canadian broadcasting. It secures its great range and flexibility through the use of three stages of radio frequency amplification in combination with two stages of audio frequency amplification and a unique switching system, which gives an exceptionally great variation of amplification and selectivity.

Mail Orders Promptly Attended To-Phone, Write or Telegraph

sets on the market.

Dealers

### Department of Commerce Has Traveling Radio Inspector's Office

OST of the delegates to the recent fourth national radio conference were greatly interested in a radio test car which was, on several occasions. parked in front of the Chamber of Commerce of the United States, where the sessions of the conference were held.

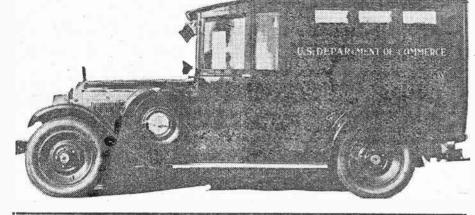
This car is the latest contribution to service made by the radio division of the Department of Commerce. Chief Radio Supervisor Terrell and his associates are very proud of it and sanguine for its usefulness. The car is, in effect, a completely equipped traveling radio inspector's office. It carries a typewriter, stationery, a supply of bank forms and other necessary impediments. A Packard standard chassis has been surmounted by a specially designed covered body which houses the radio equipment. The front seat comfortably holds three persons and in an emergency could be used as a bed.

The primary uses to which this new radio car will be put are testing broadcasting station wave lengths, elimination of beat notes, detecting power interference and conducting examinations for both commercial and amateur licenses. In many cases, especially in isolated communities, the car will drive right up to the applicant's door and examine him on the spot. Full equipment, including an omnigraph, is provided for this purpose.

Department to Have Nine Cars

Eventually the department hopes to have at least nine of these cars, one for each of the present radio inspection districts. The local radio inspector will always be in charge of and responsible for the car assigned to him.

Apparatus is provided for testing field strength and a standard Kolster marine compass enables the operatives to locate | emergency communication in time of dis- | fire or any like catastrophe where teleillegal stations. The equipment also in- aster. It also may be used as a receiver phone and telegraph communication is de-





Interior and exterior views of the Department of Commerce radio truck

for measuring wave lengths and for | 50 to 3,500. In case of a cyclone, flood,

chudes a fifty-watt oscillating transmitter | and operates on any wave length from | stroyed one of these radio test cars would | visit to their homes on December 24.

be rushed to the scene to re-establish contact with the outside world and direct relief measures and assistance.

A special superheterodyne, operating also on 50 to 3,500 meters for checking purposes, is a part of the mobile installation. An amateur receiver working the amateur wave lengths also is included in the equipment. Other apparatus comprises a special induction receiver adjustable to Piezo electric oscillator for checking wave lengths.

Power for ten hours' continuous operation of the radio equipment is supplied from a forty-eight-volt storage battery. This may be recharged, one cell at a time, while the car is in motion.

#### Santa Claus Broadcasts

Though a comparatively new name to radio programs, that cheery old gentleman, "Santa Claus, Esq.," has proved one of the genuine feature speakers at WOR. through which station he speaks nightly until Christmas, broadcasting his greetings to boys and girls of all ages from an illuminated airplane each evening from 6:15 to 6:25. The whirr of his plane motor adds zest to the novelty feature as he wings through the clouds covering northern New Jersey each evening. The method employed is to broadcast his talk on a short wave length, which is picked up and relayed through WOR.

Listeners located in the outlying districts of Newark, N. J., have the added pleasure of seeing him in his brilliantly lighted plane, from which he sends forth three mystic light shows each evening. The reported purpose of his nightly lights is to locate the homes of all good lads and girls in order that he may make a speedy

## Additional Radio Programs for the Week

(Continued from preceding page)
WFI-PHILADELPHIA-395 7 p. m.—Tea room ensemble. 8 p. m.—Sherwood Century Club p 5:15 p. m.—Mack % Lence, songs.
6:30 p. m.—Concert Orchestra.
7 p. m.—Dance Orchestra.
8-11 p. m.—Program same as WEAF, WLIT-PHILADELPHIA-395

12:05 p. m.-Organ; Religious Service Orchestra.

9. m.—Concert Orchestra.

4:30 p. m.—Studio hour.

7:30 p. m.—Dream Daddy. WCAU—PHILADELPHIA—278

6:30 p. m.—Billy Hays's Orchestra.
7:30 p. m.—Recital.
9 p. m.—Barry O'Moore, tenor.
9:30 p. m.—Musical Chefs.
10 p. m.—Sesqui-Centennial Hour.
11 p. m.—The Parodians.
11:30 p. m.—Dadix Revue.

WPG—ATLANTIC CITY—300
6:30 p. m.—Billy Rocan "Sports" 6:30 p. m.—"Billy" Rocap, "Sports."
6:45 p. m.—Organ Recital.

V p. m.—Dinner music:
8 p. m.—World, Wonder Excursions.
8:15 p. m.—Concert.

-Dance Orchestra WHAR-ATLANTIC CITY-275 m.—Seaside Trio.
p. m.—Health talk.
m.—Seaside Trio.
m.—Studio Concert.

9 p. m.—Studio Concort.

WGY—SCHENECTADY—380

2 p. m.—Music; talk.
6:30 p. m.—Dinner program.
7:30 p. m.—WGY Book Chat."
7:45 p. m.—WGY Orchestra.
3 p. m.—WGY Orchestra.
4 p. m.—Hoyal States Army Band.
6 p. m.—Royal Salon Orchestra.
10 p. m.—Address, "Europe and Ourselves," Herbert Gibbons.
10:30 p. m.—WGY Orchestra; Matilda Russ, soprano.
11:30 p. m.—Organ recital.

8-11 p. m.—Program same as WEAF,
WTIC—HARTFORD, CONN.—476

wJAR—PROVIDENCE—306
p. m.—Joe McNamara's Orchestra.
m.—Orchestra.
m.—Goodrich Zippers. WGBS—NEW YORK CITY—316

10 a. m.—Timely talks with Terese.
10:10 a. m.—Chick Fischer, ukulete.
10:20 a. m.—Chick Fischer, ukulete.
10:20 a. m.—Fashion talk; songs.
1:30 p. m.—Scripture reading.
1:35 p. m.—Atlas String Trio.
3 p. m.—Interview with Evelyn Horbert and Harry Welchman.
3:10 p. m.—'Children of All Nations."
3:30 p. m.—Helen Johann, soprano.
3:40 p. m.—League of Women Voters, talk by Prof. Charles Hodges.
3:50 p. m.—Helen Johann, soprano.
6 p. m.—Uncle Geebee.
6:30 p. m.—Jule Anzel's Orchestra.
7 p. m.—"What's Your Radio Problem?"
7:10 p. m.—Jule Anzel's Orchestra. 9:15 a. m.—Christmas carols.
10:30 a. m.—Bible readings; club talks.
12:15 p. m.—Noon service.

1 p. m.—Concert.
1:30 p. m.—Dinner to Malcolm Nichols.
4 p. m.—Mořey Pearl's Ramblers.
6 p. m.—The Smilers.
6:30 p. m.—Dinner dance.
7:05 p. m.—Talks, Mr. Raymond.
8 p. m.—Musical program.
9 p. m.—Botolphian Quartet.
10 p. m.—Dance music. WEEL—BOSTON—349

D. m.—Lost and Found; weather.

D. m.—Elg Brother Club.

D. m.—Classifying the Stars.

D. m.—Program same as WEAF.

WBZ—SPRINGFIELD, MASS.—333 p. m.—Dinner concert.
m.—Market reports.
p. m.—"English Literature." Presor E. Black. fessor E. Black.
7:30 p. m.—Dance orchestra.
8 p. m.—Second New England Forestry
Congress.
9:15 p. m.—Musical program.
10:20 p. m.—McEnelly's Orchestra.

8-11 p. m.—Program same as WEAF.

WRC—WASHINGTON—469

10 a. m.—Women's Hour from WJZ.

12 noon—Organ recital.

p. m.—Mayflower Orchestra.

p. m.—Smithsonian talk.

7:10 p. m.—Shoreham Orchestra.

9:30 p. m.—Royal Salon Orchestra.

10:30-11:30 p. m.—Meyer Davis's (chestra.

WBAL-BALTIMORE, MD.-375 \$:45 p. m.—Dinner music. 8-9:30 p. m.—Organ recital. KDKA—PITTSBURGH—309

3:15 p. m.—Dinner concert.
8 p. m.—Farm program.
8 330 p. m.—Richard Kountz; KDKA Symphony Orchestra; quartet.
9 p. m.—KDKA Symphony Orchestra.
11 p. m.—"Pittsburgh Post" Revue.
WCAE—PITTSBURGH—461 p. m.—Dinner concert.
p. m.—Children's period.
m.—Larkin concert.
m.—Goodrich Zippers. WADC-AKRON, OHIO-258

. m.—Dinner concert. . m.—Studio concert. WTAM-CLEVELAND-39 0 WEAR-CLEVELAND-390 7 p. m.—Dinner concert.
8 p. m.—R. T. L. program.
9 p. m.—Dutch master artists.
10 p. m.—Organ recital.

8-10 p. m.—Organ recital.

WSAI—CINCINNATI—326
8-10 p. m.—Program same as WEAF.

WLW—CINCINNATI—422
8 p. m.—Dinner concert; bridge lesson.
11 p. m.—Doherty Melody Boys.
11:40 p. m.—Irene Downing, planiste.
12 midnight—Orchestra and organ.

WKRC—CINCINNATI—422
9 p. m.—Instrumental and vocal solog. 10 p. m.—Post-Wurlitzer classical scries.

WJR—PONTIAC, MICH.—517
m.—Goldkette's Orchestra; soloist.
m.—Serenaders and soloists.
m.—Dance orchestra. WWJ—DETROIT—353
—Dinner concert.
—Program same as WEAF. WREO-LANSING, MICH.-286

6 p. m.—Dinner concert. 8:15 p. m.—Orchestra; quartet; instru-mental solos. WMAQ-CHICAGO-448 —University of Chicago lecture m.—Church choir. WEBH-CHICAGO-370

8 p. m.—Orchestra concert; son 10 p. m.—Dance music; songs; 12-2 a. m.—Dance music; songs WOK-CHICAGO-217 m.-Concert hour. n.-2 a. m.-Musical features WGN-CHICAGO-370 WAHG—RICHMOND HILL, N. Y.—316

12 noon—Sid Cohen, pianist.

7:30 p. m.—Professor Richard Mayne,

"Speech."

7:46 p. m.—Edgar Gruen, barytone.

8 p. m.—W. A. Goldsworthy, organist.

9 p. m.—Radio Santa Claus.

9:15 p. m.—Edgar Gruen, barytone.

9:30 p. m.—Branfield Trio.

9:45 p. m.—Betty and Helen Lasner,
duets.

8:30 p. m.—Dinner music. 10:30 p. m.—The classic hour. 12:30 a. m.—Dance music. KYW—CHICAGO—536 § p. m.—Dinner concert. n.—Dinner concert.
b. m.—Farm speeches.
c.—"Good Reading." m.—Musical program; talk WENR—CHICAGO—266

7 p. m.—Dinner concert. 9-11 p. m.—Popular program. WQJ—CHICAGO—448 8 m.—Rainbow Orchestra.
11 p. m.—Rainbow Skylarks.
2 a. m.—Ginger hour.
WIS—CHICAGO—345 7:15 p. m.—Organ; story. WHT—CHICAGO—400

8 p. m.—Marie Lynn, soprano. 8:15 p. m.—Shirley Fullon, pianiste. 8:30 p. m.—Tom Carlo's Orchestra. 9:30 p. m.—Mabel Kennedy, soprano. 9:45 p. m.—A alon Ramblers. 10:45 p. m.—Bob Hildenbrand's Four. 7 p. m.—Classical program. 8:45 p. m. (238 meters)—Alamo Orchestr 10:30 p. m.—Entertainers. 11:10 p. m.—Dance music. 1 a. m.—Your Hour League. WJAZ—CHICAGO—322 WOR-NEWARK-405 WOR—NEWARK—405
6:45, 7:15 and 7:45 a. m.—Gym class.
2:30 p. m.—C. Feland Gannon, barytone.
2:45 p. m.—Mrs. Anita Priest, contraito.
3 p. m.—"The Radio Ghost."
3:15 p. m.—Basil Sidney, readings.
3:45 p. m.—"Basil Sidney, readings.
3:45 p. m.—"Rudyard Kipling," B. P. Adams.
6:15 p. m.—Aerial Santa Claus.
6:25 p. m.—Words mispronounced.
6:27 p. m.—"Sports," Bill Wathey,
6:37 p. m.—"Mag. in the Moon Stories."
7 p. m.—Jacques Jacobs's Ensemble.
7:25 p. m.—News bulletin. 11 p. m.-1 a. m.—Concert.

WCBD—ZION, ILL.—345

9 p. m.—Mixed quartet and celestial bells.

WBBM—CHICAGO—226

10 p. m.—Orchestra and artists,

11 p. m.—1 a. m.—Artists and dance music.

WIBO—CHICAGO—226 m.—Dinner concert.
.—Midnight Jamboree.
WOC—DAVENPORT—484 6:45 p. m.—Chimes. 8-11 p. m.—Program same as WEAF. 12 midnight—Orchestra selections.

#### FRIDAY

WJZ-NEW YORK CITY-455

WJY-NEW YORK CITY-405

WEAF-NEW YORK CITY-492

m.—Home service talk.
m.—Music.
i. m.—Talk.

WHN-NEW YORK CITY-361

m.—Eva Rothenberg, planist, p. m.—Margaret Haase, soprano, p. m.—Hock and Jerome, songa, p. m.—Judith Roth, soprano.

6:30 p. m.—Daddy Dingle.
6:45 p. m.—Dinner music.
7 p. m.—Harry Richman's Entertainers.
7 p. m.—Harry Richman's Entertainers.
7:30 p. m.—Melody Orchestra.
8 p. m.—Jack Davis, barytone.
8:15 p. m.—Lulu Weyant, songs.
8:30 p. m.—Frivolity Orchestra.
9 p. m.—Henry Levitzky, violinist.
9:20 p. m.—Joe Sherman, songs.
10:30 p. m.—Dance orchestra.
11:30 p. m.—Broadway Orchestra.
11:30 p. m.—Broadway Orchestra.
12 a. m.—Orchestra.

WNYC-NEW YORK CITY-526

WNYC-NEW YORK CITY-526
6:10 p. m.—Market high spots.
6:20 p. m.—Plano selections.
6:30 p. m.—Elementary French lessons.
7 p. m.—Advanced French lessons.
7:30 p. m.—Police alarms.
7:35 p. m.—Board of Estimate meeting.
8 p. m.—The Kessler Ensemble.
8:40 p. m.—Emily Taylor, contraito.
8:40 p. m.—Doseph Palmroot, tenor.
9:10 p. m.—Colonial Orchestra.
10:10 p. m.—Colonial Orchestra.
10:10 p. m.—Books," Prof. J. G. Carter
Troop.
10:30 p. m.—Police alarms; weather.
7 p. m.—Blenheim Theater Ensemble.
7:45 p. m.—Kathryn Connolly, soprano.
8 p. m.—A. Wayne, entertaining reporter.

porter. 8:15 p. m.—Carrie Cohen, pianist. 8:30 p. m.—Rudolph Joskowitz, violinis

WMCA-NEW YORK CITY-341

WMCA—NEW YORK CITY—341

6 p. m.—Olcott Vali's String Ensemble.
6:30 p. m.—Ernie Golden's Orchestra.
7 p. m.—"The Uses of Lacquer."
7:10 p. m.—Ernie Golden's Orchestra.
7:30 p. m.—Radio Entertainers.
8 p. m.—Course in public speaking.
8:15 p. m.—Edward French, pianist;
Ralph Odiorno, barytone; Cecile Arnold, soprano.
8:50 p. m. "Criminals and Their Treatment," Leon C. Weinstock.
9-11 p. m.—Hardman Hour of Music.
11 p. m.—Ukelele Bob McDonald.
11:155 p. m.—Donald. Flamm, with guest celebrities.

WRNY-NEW YORK CITY-259

WRNY—NEW YORK CITY—259

12 noon—Luncheon music.

1:30 p. m.—Dr. Harry Finkel, "Diet."

1:45 p. m.—"Women in Business."

6 p. m.—Orchestra.

6:15 p. m.—Daddy Dingle.

7 p. m.—"Whose Birthday To-day?"

7:05 p. m.—Sportflash.

7:10 p. m.—Commerce of the day.

7:15 p. m.—Opera notes.

7:20 p. m.—Studio program.

p. m.—Studio program.
p. m.—Alfred W. McCann, "Foods."
m.—Grand opera concert.
p. m.—"The Divining Rod."
p. m.—"Temple Dancer," John Hugo.

WFBH-NEW YORK CITY-273

2 p. m.—Studio program.
4 p. m.—Songs.
4 30 p. m.—Tea table talk.
4 45 p. m.—Daisy Turchin, soprano.
5 p. m.—Murray Schwartz, pianist.
5 30 p. m.—Bert Dixon, tenor.
5 45 p. m.—Katherine Adolphe, songs.
6 p. m.—Hotsy Totsy Boys.
6 15 p. m.—Tierney Chefs.
11 30 p. m.—Fordham Orchestra.
WILL NEW WORK (UN) 200

WLWL-NEW YORK CITY-288

WAHG-RICHMOND HILL, N. Y .- 316

duets.

10 p. m.—Branfield Trio.
10:15 p. m.—Billy Eisenhuth's Lynbrook

WGBB-FREEPORT, N. Y.-244

p. m.—Entertainers, p. m.—Studio program.

11 a. m .-- Proxy Shoppers

n.—Dinner music.

3:45 a. m.—Health exercises.

1 p. m.—Ambassador Trio. 2-4-5:30-7:30-10:30 p. m.—News. 4:30 p. m.—Astor Tea Orchestra. 5:32 p. m.—Market quotations. 5:50 p. m.—Financial

WGCP—NEWARK—252
—Plano; race results (half hourly). | 6 p. m.—
—Songs. | 8 p. m.—
—Studio program | 9 p. m. m.—Songs.
m.—Studio program.
m.—Studio program.
m.—Sylvia Rose, songs.
p. m.—Molzen's Dance Orchestra.
m.—Richman Entertainers.
p. m.—Richard Cheatham's Band.
p. m.—Win Unger, songs. WAAM-NEWARK-263 5:32 p. m.—Market quotations.
5:50 p. m.—Financial summary.
6:30 p. m.—N. Y. U. course: "Tariff Problems," Professor Reid McClung.
7 p. m.—Bernhard Levitow's concert.
7:55 p. m.—"Law Enforcement," John Kennedy.
8:10 p. m.—Estey hour.
9 p. m.—U. S. Army night; Army Music School Band.
10 p. m.—To be announced.
10:30 p. m.—Lorraine Orchestra. m.—Happy Hour; Cooking m.—Clarinet trio; talk. 1 6 p. m.—Clarinet trio; talk.
6:35 p. m.—Danny Hope's Melody Boys.
7:30 p. m.—Danner to Princeton football
t am by Alumni. Music and speakers.
7:40 p. m.—Cora Mort's, soprano.
8 p. m.—Mildred Germaine, pianist.
8:15 p. m.—Stewart's Banjo Orchestra.
8:50 p. m.—Jolly Bill Steinke.
9:055 p. m.—Hilda Kay, contraltb; George
Brown, tenor.

Brown, tenor. 10:15 p. m.—Joe Chickene's Orchestra. WIP-PHILADELPHIA-508 7:30 p. m.—Irwin Abrams's Orchestra. 8:20 p. m.—"The Hidden Idol," musica comedy, by WGY Players, WOO-PHILADELPHIA-508

WOO—PHILADELL A. M.—Grand organ.

12 noom—Luncheon music by Golden's Crystal Tea Room Orchestra.

4:45 p. m.—Grand organ; trumpets.

7:30 p. m.—Dinner music.

8 p. m.—WOO Orchestra; artists.

9 p. m.—Hohner Harmonica. 11:15 a. m.—Talk,
11:30 a. m.—Columbia University lecture.
12 (neon)—Market and weather reports.
4 p. m.—Eddie Brennan, Dick Adams,
singers.
4:15 p. m.—Alfred Dulin, planist,
4:30 p. m.—Robert Lewis, cellist.
4:45 p. m.—"Christmas Greens," Mrs.
Clarence Hyde.
6 p. m.—Dinner muslc.
7 p. m.—"Through Toyland."?
7:30 p. m.—Story teller. 9 p. m.—Thomer Harmonica. 9:30 p. m. Theater grand orchestra. 10 p. m.—Grand organ recital. 10:30 p. m.—Dance music. WFI—PHILADELPHIA—395

10:30 a. m.—Solos; home service talk.

1 p. m.—Tea room ensemble.

3 p. m.—Vocal solos.

3:45 p. m.—Fashlon feature.

3:30 p. m.—Concert orchestra. 7 p. m.—"Through Toyland."?
7:30 p. m.—Story teller.
7:45 p. m.—Thomas Hughes, pianist.
8 p. m.—The Happiness Boys.
8:30 p. m.—Eagle Trio.
9 p. m.—Hohner Harmony Hour.
9:30 p. m.—Trik, Lawrence Mayers.
9:40 p. m.—Myrtle Mason, contraito.
9:55 p. m.—May Breen, banjoist; Peter 10:10 p. m.—John Booth, basso.
10:25 p. m.—May Breen, Peter De Rose.
10:45 p. m.—Theo Alban, tenor.
11-12 p. m.—Dance music. -Dance orchestra. WLIT-PHILADELPHIA-395 p. m.—Concert orchestra. :30 p. m.—Al Hughes's Dance Orchestra. :30 p. m.—Dreum Daddy. p. m.—Talk, "Philadelphia Firsts." WGBS-NEW YORK CITY-316

1 p. m.—talk, Findaciphia 1.15 p. m.—Concert music. 1.30 p. m.—Sports talk. 1.45 p. m.—Musical program 0 p. m.—Arcadia Dance Orchestra. 0:30 p. m.—Rufus and Rastus. 11 p. m.—Pen and Pencil Club. WCAU-PHILADELPHIA-278 45 p. m.—Clarence Seaman's 30 p. m.—Smoker Entertainn

WPG—ATLANTIC CITY—300
p. m.—Organ recital.
a.—Trio dinner music.
m.—"Educational Series," M
el.

WHAR-ATLANTIC CITY-275 2 p. m.—Seaside Trio. 7:30 p. m.—Sport talk. 8 p. m.—Seaside Trio. 11:15 p. m.—Strand Organ Recital. WGY-SCHENECTADY-380

7 p. m.—Dinner music.
7:30 p. m.—Health talk.
7:40 p. m.—"French by Radio."
8:15 p. m.—Musical comedy in three acts,
"The Hidden Idol," WGY Orchestra.
10:30 p. m.—WGY Orchestra; Sidney
Ashe, speaker.

30 p. m.—Lain.
45 p. m.—Concert.
30 p. m.—Charles Adams and daughters.
0.15 p. m.—W. Earl Brownjohn, barytone.
10.30 p. m.—Hewitt Humorists.
11 p. m.—1 a. m.—Supper music; Arthur
Melgier, organist.

30 p. m.—Weather: market report. WCAC—MANSFIELD, CONN.—275 m.—Poultry lecture.

WTIC—HARTFORD, CONN.—476 7 p. m.—Dinner music.
7:30 p. m.—Watson Woodford, tenor.
8:30 p. m.—Community Night; brassband; male chorus; brass quartet; sax ophone quartet; organist and artists talk, Judge Epaphroditus Peck.
1:30 p. m.—Clockmakers Saranadass

WJAR-PROVIDENCE-306 WJAK—PKOVIDENCE—306
1:05 p. m.—Woodstock Entertainers,
7:45 p. m.—Margaret Reid.
8 p. m.—Haig Baligian, violinist,
8:20 p. m.—Health talk.
8:30 p. m.—Gorman's Jolly Bakers,
9 p. m.—Hohner Harmony Hour. 11 p. m.—Dance orchestra. WEEI—BOSTON—349

WEEI—BOSTON—349
6:45 a. m.—Health exercises.
3 p. m.—Talk, Dr. H. J. Broughton.
6:40 p. m.—Lost and Found; weather.
6:45 p. m.—Big Brother Club.
7:30 p. m.—Four Merry Milkmen.
8 p. m.—Sager's Half Hour.
9 p. m.—Hohner Harmony Hour.
9:30 p. m.—Musicale.
10 p. m.—Scotty Holmes's Orchestra.
WNAC—BOSTON—280
9:15 a. m.—Christmas carols.
10:30 a. m.—Bible readings; club talks.
12:15 p. m.—Noon service.
1 p. m.—Luncheon concert.

| 2:16 p. m.—Noon service.
| p. m.—Luncheon concert.
| p. m.—Tea dance.
| p. m.—Kiddies Klub.
| 1:30 p. m.—Dinner Dance.
| p. m.—Leslie Hunting Band.
| p. m.—Dance music.
| ADD SATURDAY WIZ—SPRINGFIELD, MASS.—333

6:30 p. m.—Lenox Ensemble.
7 p. m.—Market report.
7:15 p. m.—Ippolito Quartet.
8 p. m.—Edwin McEnelly's Orchestra.
8:30 p. m.—Edwin McEnelly's Opera.
9:30 p. m.—Whatdoyoucallit Club." WTAG-WORCESTER, MASS-268 0:30 a. m.—Musical selections. 0:45 a. m.—"Food Hints," Mildred

m.—Market and weather report. n.—Concert program. WRC—WASHINGTON—469 a. m.—Women's hour from WJZ. (noon)—Organ recital, p. m.—New Willard Orchestra. b. m.—W. Spencer Tupman's Orchestra.

6 p. m.—Book reviews.

WCAP—WASHINGTON—469
6:45-7:45 a. m.—Health exercises.
7-12 p. m.—Dally market summaries;
"Radio Transmission of Music," by
Professor Dayton Miller; Mozart String
Quintet; concert by Men's Club; Dance WBAL-BALTIMORE, MD.-375 -10 p. m.—Male choir and soloists. KDKA—PITTSBURGH—309

p. m.—Teaberry time.
WCAE—PITTSBURGH—461 6:30 p. m.—Dinner concert.
7:30 p. m.—Children's period.
8:30 p. m.—Pleasant Valley Orchestra.
WADC—AKRON OHIO—258
6:30 p. m.—Portage Quintet.
8-11 p. m.—Studio concert.
WTAM—CLEVELAND—390 6 p. m.—Dinner music.
WEAR—CLEVELAND—390 7 p. m.—Singing Syncopators. 8 p. m.—Children's program, 8:30 p. m.—Talks.

10 p. m .- Singing Syncopators.

WWJ-DETROIT-353
6 p. m.-Dinner concert.
8 p. m.-News orchestra; soloists.
9 p. m.-Dance music. WJR-PONTIAC. MICH.-517 . m.—Orchestra; soloists and trio. m.—Musical program. WREO-LANSING, MICH.-286

WMAQ-CHICAGO-448 m.—Wide-Awake Club,
—Mr. and Mrs. M. Obendorfer,
m.—Whitney Trio,
n.—University of Chicago lecture;

songs. 10:45 p. m.—Christian Endeavor topics. WEBH-CILCAGO-370 8 p. m.—Oriole Orchestra; songs. 10 p. m.—Dance music; Light Opera Company. 12-2 a. m.—Dance music; recital. WGN-CHICAGO-370

m.—Dinner music.

D. m.—The Classic Hour. 10:30 p. m.—The Classic 10:30 p. m.—Dance music. 12:30 p. m.—Dance music. WBBM—CHICAGO—226 vertists: trio and orch 9-11 p. m.—Artists; trio and orchestra.
WHT—CHICAGO—400 WHT—CHICAGO—400
7 p. m.—Classical, program.
8:45 p. m.—Alamo Orchestra.
10:30 p. m.—Dutch Masters.
1 a. m.—Your Hour League.
WOK—CHICAGO—217

3-8 p. m.—Concert and dance music 11 p. m.-2 a. m.—Musical features: chestra.

WIS-CHICAGO-\$45

:15-12 p. m.—Organ; story; farm
gram; church choir; trio concert.

WIBO-CHICAGO-\$28 il p. m.—Special O. Henry Night KXW—CHICAGO—536

.—Midnight revue.

Organlogue.

"Insomnia Club."

WENR—CHICAGO—266 p. m.—Popular program.
m.—All America Pioneers.
WOC—DAVENPORT—484

SATURDAY

WEAF-NEW YORK CITY-492

a. m.—Health exercises. —Norman Strutt's Orchestra.

WJZ-NEW YORK CITY-455

p. m.—Irwin Abram's Orchestra. 4, 5:30, 7:30 and 10:30 p. m.—News 05 p. m.—Sosonsky and Slotnick, ba

am Fagan, barytone.

10:30 p. m.—Jack Myer's dance musi

Abel. 8:15 p. m.—Studio program. 8:50 p. m.—'Weekly Line of Cheer." 9 p. m.—Concert Orchestra. 10 p. m.—Dance Orchestra. 11 p. m.—Organ recital.

WGR-BUFFALO-319

WGBS—NEW YORK CITY—316
10 a. m.—Timely Talks with Terese.
10 10 a. m.—Kiddie Club.
10:10 a. m.—Kiddie Club.
10:50 a. m.—Lillian Mendetz, recitations.
10:50 a. m.—Fashion talk.
1:30 p. m.—Scripture Reading.
1:35 p. m.—Gertrude Seidenman, planist.
2 p. m.—Dance Orchestra.
3 p. m.—Irving Cohen's Orchestra.
3:10 p. m.—Ethel McKay, soprano; orchestra. WHAM—ROCHESTER, N. X.—278
30 p. m.—Eastman Theater Orchestra
p. m.—Student recital.
p. m.—Theater Orchestra.

3:10 p. m.—Ethel McKay, soprano; orchestra.
6 p. m.—Uncle Geebee.
6:30 p. m.—Sorey's Concert Trio.
7 p. m.—Serey's Concert Trio.
7 p. m.—Ethel Defense Lofter, soprano.
7:10 p. m.—Jack Miller, violin'st.
7:30 p. m.—Judith Roth Trio.
7:45 p. m.—Robert Sherwood, tenor.
8 p. m.—Westfield-Elizabeth Elics' Band.
8:30 p. m.—Westfield-Elizabeth Elics' Band.
8:30 p. m.—Westfield Band.
9 p. m.—Elsa Hoehn, Ilsa Sherwood,
duets.
9:20 p. m.—Elsa Hoehn, Ilsa Sherwood,
duets.
9:20 p. m.—Arrowhead Orchestra.

WMCA—NEW YORK CITY—341

WMCA—NEW YORK CITY—341

6 p. m.—Olcott Vail's String Ensemble.
7 p. m.—Amphion's dance orchestra.
8 p. m.—Talk on Current Events.
8:15 p. m.—Catherine Harvey, soprano.
9:30 p. m.—Cinderella Dance Orchestra.
10 p. m.—To be announced.
11 p. m.—Ernie Golden's Orchestra.

11 p. m.—Ernie Golden's Orchestra.

WNYC—NEW YORK CHTY—526
7 p. m.—Jean Circno's Orchestra.
7:35 p. m.—Jean Circno's Orchestra.
8 p. m.—Police Glee Club.
9 p. m.—Herman Neuman, planist.
9:30 p. m.—Edna Commerford, violinist.
9:40 p. m.—Frank Griffin, accordion.
9:50 p. m.—Edna Commerford, violinist.
10 p. m.—Frank Griffin, accordion.
10:10 p. m.—Frank Griffin, accordion.
Mexico."

Mexico." 10:30 p. m.-Police alarms; weather. WRNY-NEW YORK CITY-259

WRNY—NEW YORK CITY—259

2 p. m.Luncheon music.
1:30 p. m.—Women's Hour.
6:55 p. m.—New York Neighborhoods.
7 p. m.—"Whose Birthday To-day?"
7:05 p. m.—Telegraph sportflash.
7:10 p. m.—Comnerce of the day.
7:15 p. m.—Opera notes.
7:20 p. m.—Anna Russo, songs.
7:35 p. m.—Whental Hyglene."
7:45 p. m.—Orlando's Orchestra.
8:30 p. m.—Ben Bernie's Orchestra.
8:30 p. m.—Ben Bernie's Orchestra.
9:30 p. m.—Radio Men's Hour.
10:30 p. m.—Tejction." Frances K. Rea
11 p. m.—Motion Picture Review ar p. m.—"Fiction," Frances K. I m.—Motion Picture Review

WFBH—NEW YORK CITY—278
p. m.—Bert Lowe's Entertainers
p. m.—Paul Epps' Revellers,
p. m.—Bert Harris's Orchestra. i b. m.—Bert Harris's Grenestra.
i-i-5 p. m.—Abner Silver, songs.
5 p. m.—Suray V. Turits.
5:15 p. m.—Mack and Lence, songs.
5:30 p. m.—Frances and Howard Kirsch, 5:30 p. m.—Arthuros Barra, songs.
6 p. m.—Phillip von Hagen, tenor.
6:15 p. m.—Arrighi Singers.
6:45 p. m.—Arthur Hand, barytone.

7 p. m.—Majestic String Ensemble.

WOKO—NEW YORK CITY—233

S.15 p. m.—Lucille Neustadt, soprano.

S.35 p. m.—Regalbuto Sisters, piano duets. duets.

9:05 p. m.—Beatrice Meisler, recitations.

9:20 p. m.—Isabel Henderson, soprano.

9:35 p. m.—Raymond Maher's Gang.

WBBR—STATEN ISLAND, N. Y.—273

8 p. m.—Dr. Hans Haag, violinis.

8:10 p. m.—L. Marion Brown, soprano.

8:20 p. m.—Bible questions and answers.

8:40 p. m.—Soprano and violin solos. :40 p. m.—Soprano and violin solos. WAHG—RICHMOND HILL, N. Y.—316 12 noon—Joe Zimmerman, pianist. 12 midnight—Dance orchestra. WGCP—NEWARK—252

WGCP—NEWARR—2008

3 p. m.—Piano; race results (half-hourly).

3:30 p. m.—John Landers's Aces.

4:45 p. m.—Rust and Hendricksen,

5 p. m.—Dande orchestra.

8:30 p. m.—Daddy Dingle.

9:30 p. m.—Ukelele Bob McDonald.

9:45 p. m.—Arline Felker entertainers.

10:15 p. m.—Petitt, Frasier, Marcus Trio.

10:45 p. m.—June Lee, Sammy Fain entertainers.

10:15 p. m.—Strickland's Orchestra.

11 p. m.—Strickland's Orchestra.

WOR—NEWARK—405
2:30 p. m.—Dorothy Paca, soprano.
2:45 p. m.—Talk, Mrs. Gibson Arnoldi.
3 p. m.—Dorothy Paca, soprano.
3:15 p. m.—Zirs Casino tea music.
6:15 p. m.—Aerial Santa Claus.
6:25 p. m.—Words mispronounced. 5.19 p. m.—Zits Casino tea music.
6:15 p. m.—Words mispronounced.
6:27 p. m.—Words mispronounced.
6:27 p. m.—Words mispronounced.
6:37 p. m.—Jacques Jacobs's Ensemble.
7:30 p. m.—Varins's Collegians.
8 p. m.—Horace Taylor, reader.
8:15 p. m.—Katinka Narinska, pianist.
8:30 p. m.—College Glee Club.
8:45 p. m.—Katinka Narinska, pianist.
9 p. m.—College Glee Club.
9:15 p. m.—Channing Pollock, "The Theater and World Peace,"
9:15 p. m.—College Glee Club.
9:30 p. m.—Middle Atlantic Fisheries Association banque.
10:15 p. m.—Clarence Williams's Trio.
11 p. m.—Dance orchestra.
WAAM—NEWARK—263

WAAM-NEWARK-263 .—Orchestra; talk. nn.—Al Püster's Orchestra. WOO-PHILADELPHIA-508

4:45 p. m.—Grand organ; trumpets 7:30 p. m.—Dinner music. WIP-PHILADELPHIA-508 WIP—PHILADELPHIA—508
6:45 a. m.—Settling-up exercises.
10:30 a. m.—Special reducing exercises.
1 p. m.—Organ recital.
3 p. m.—Dal Ruch's Areadians.
6:05 p. m.—Dinner music.
7 p. m.—Bedtime story.
8 p. m.—Sports Corner.
8:15 p. m.—'Thinking With Children."
8:30 p. m.—Concert.
11:06 m.—Organ recital

WFI-PHILABEA.

p. m.—Tea Room Ensemble.

p. m.—Harmony Trumpeters.

p. m.—Play, 'The Deceiving Widow,"

6:30 p. m.—Concert orchestra.

p. m.—Dance orchestra.

p. m.—The Octave Club Chorus.

p. m.—Readings by Edna M. Snyder.

p. m.—W. G. I. Music Masters. WFI-PHILADELPHIA-508

1:30 p. m.—Luncheon music; J. Leonard Lewis, director. 5:45 p. m.—Organ recital. 7 p. m.—Ambassador dinner music. 8 p. m.—'Irish Sunshine.'' 8:20 p. m.—New Jersey Association of Real Estate Boards; Roxy's Gang. 10 p. m.—Dance orchestra. WHAR-ATLANTIC CITY-275

WGY-SCHENECTADY-380 p. m.-Half-hour Bridge Lesson, 9:30 p. m.—Dance program WGR-BUFFALO-319 2:30-4:30 p. m.—Buffalo Radio Trades

7 p. m.—William Fagan, barytone.
7:10 p. m.—Hazel Gruppe, planist.
7:25 p. m.—William Fagan, barytone.
7:35 p. m.—Walter Scott, violinist.
8 p. m.—'Habit Formation.''
8:15 p. m.—Walter Scott, violinist.
8:30 p. m.—Yale Glee Club.
10:15 p. m.—Eugene Le Pique, planist.
10:30 p. m.—Flordna String Trio; Radio Dream Girl.
11-12 p. m.—Vincent Lopez's Orchestra. WHAM—ROCHESTER—278
p. m.—Eastman Theater Orchestra.
m.—Theater organ.
m.—Theater orchestra.
p. m.—Weather; market report. WMAK-LOCKPORT, N. Y.-266 WJAR-PROVIDENCE-306 WNAC-BOSTON-280

oists.

5 p. m.—Nickel's Trio.

9 p. m.—Lorraine Grill Orchestra.

22 p. m.—Market quotations.

50 p. m.—Financial summary.

p. m.—Bernhard Levitow's Concert.

p. m.—'Radio Novel,'' Cosmo Hamilton. -Luncheon conc ton. 1:15 p. m.—Liederkranz Society Concert .0:30 p. m.—Paul Specht's Orchestra. p. m.—The Smilers.

30 p. m.—Dinner dance.

35 p. m.—Mainer discovered by the second s

WTAG-WORCESTER, MASS.-268 WRC-WASHINGTON-469 WKC—WASHINGTON—469

12 (noon)—Organ recital.

1 p. m.—Hamilton Orchestra.
6 p. m.—Hamilton Orchestra.
7 p. m.—Washington Orchestra.
7:55 p. m.—Zoological talk.
8:10 p. m.—Bible talk.
10:30 p. m.—"Crandall's Saturday Nighters."

(midnight)-Spanish Village Or KDKA-PITTSBURGH-309 p. m.—Dinner concert. p. m.—Westinghouse Band; quartet. WCAE-PITTSBURGH-461

WADC-AKRON, OHIO-258 WTAM-CLEVELAND-390 p. m.—Miscellaneous concert. to 12 p. m.—Ev Jones's Coo-Coo Club. WEAR-CLEVELAND-390

WSAI—CINCINNATI—326 WKRC-CINCINNATI-422

WLW-CINCINNATI-422 WJR-PONTIAC, MICH.-517 m.—Orchestra and soloists.
m.—Goldkette's Serenaders; soloists.

WREO-LANSING, MICH.-266 10 to 12 p. m.—Dinner concer WGN—CHICAGO—370 8:30 p. m.—Dinner musec. 10:30 p. m.—The classical hour. 12:30 a. m.—Dance music. WMAQ-CHICAGO-448

m.—Organ and orchestra music. m.—Russell Pratt, Frederick Daw, p. m.—Radio photologue, m.—Theater review, WQJ-CHICAGO-448 WEBH-CHICAGO-370

-Dinner concert; Sunday school lesson.

10 p. m.—Dance music; violin; readings.

12 to 2 a. m.—Dance music; songs.

WLS—CHICAGO—345

8 p. m. to 1 a. m.—Story; WLS, barn dance; Joe Bren's Minstrels. WHT-CHICAGO-400 p. m.—Classical program. 3:45 p. m. (238 meters)—Alamo Or-

0:30 p. m.—Jelke Entertainers. Your Hour League. KYW-CHICAGO-536 Congress classic.
—"Congress Carnival." "Insomnia Club."
WOK-CHICAGO-217 6-8 p. m.—Concert and dance music 11 p. m.-2 a. m.—Musical program. WENR—CHICAGO—266

Bob's Radio Cure Results for Broadcasting For "Roomitism" (Continued from page one)

Horizontal Waves Give Best

An Analysis of Reports Received From Radio

Listeners on a Transmission Test Pro-

vides Much Interesting Data

By W. T. Meenam

- General Electric Company

polarized on a vertical plane.

time answering it. was kicking the daylights out of very marked.

Rusty's radio set. Company, at Schenectady, indicate that horizontal radiation gave better radio.

service in the zone from 60 to 250 miles from Schenectady, while at Later we heard that Mrs. Jones. along these lines. who had been believing her husband greater distances the vertical antenna radiation was more satisfactory. had roomitism, came out and after First Clarinet Duct Over Reports also verified, in part, the theory of E. F. W. Alexanderson, that horizontally polarized waves may twist in their progress until they are onstration came to the conclusion A complete, non-technical report by was the louder, and the majority of accept that job on the street force that job on the street force are "home-made" it is not difficult for A complete, non-technical report by was the louder, and the majority of accept that job on the street force Charles J. Young, under whose directisteners stated that it was less distant that had been offered him, as there Station WJZ broadcasts the first a prisoner to buy his set piecemeal tion the comparative tests were made, turbed by fading, and that the quality was several votes in his family and clarinet duet ever to be heard over and assemble it in the workshop of was somewhat better than on the election was coming on.

A large number of letters, coming vertical radiation. On the second from all directions and from all dis- night reports were about equally his radio set kicked all to pieces I John DeBueris and Americo Gentile, The accompanying pictures give tances up to 1,700 miles gave us the divided as to which was the louder, gave him an old set of mine that two of the most capable clarinetists an idea as to the use of radio in Sing. results of the horizontal and vertical although the fading was still reported worked better than the one he had of the metropolitan area. DeBueris Sing. For instance, picture No. 1 radiation tests which were made by less on the horizontal radiation. made himself, so everybody was has been heard in several concerts shows a view of the cells in the old the General Electric Company with Many noticed very bad quality on happy except Mr. Jones, who now had from WJZ in solo work, and Americo death house and the receiving the General Electric Company with many noticed toty on the second no excuse for not going to work for Gentile was formerly the leader of set in use at that time. Picture operating listeners on the nights of evening, but this should not be taken his family. November 2 and 3. We have been too surely as a mark of bad trans- Dad, when he heard how I had been Brooklyn.

much impressed with the number of mission, as it may have been in some mixed up in the ruckus, said that any man Jones to go to work deserved a pretty late and when so many letters While most of the listeners re- medal. are received it is a most encouraging ported a choice between the hori-

> day, are we?" And Billy agreed with me

73 07 00000

ANTENNA COMPARISON TEST Nov. 3, 1925 - 1240-1-454. N

VERTICAL LOUDER

Janes de

Nov. 4, 1925 - 12:00-1:15 A.M.

HARIZONNA LOUNER WILL

Chart showing analysis of listeners' reports

indication that the listeners are zontal and vertical radiations, it was

anxious to assist us in our honest clear from the letters that there was

endeavors to improve broadcasting. no enormous difference in the loud-

Of the reports received some fa- ness of the signals produced by the

vor the horizontal radiation which two types of transmission. This in

was given from midnight until 12:30, itself is an interesting fact. It indiand others favored the vertical radia. cates that waves may leave an antenna

tion which was on the air from 12:45 vibrating in either a horizontal or a

till 1:15. On each transmission the vertical plane and will then be

same antenna power was used, which, twisted around as they are trans-

due to difficulties in tuning up these mitted until they give somewhere

new forms of antennas, did not near the same effects. When they

amount to quite 50 K. W. but was a reach the receiver they both come

little greater than 30 K. W., a power in on a vertical antenna, and the

still considerably in excess of that attempts which some of you made to

used in any ordinary broadcasting determine the plane in which they

stations. One other fact which bears arrived showed that there was little

on the analysis of the data should difference in direction between them.

be noted: that the night of Tuesday, This information may be considered

November 3, when the tests were as verification, in part, of the theories

repeated, was characterized by much of E. E. F. Alexanderson and others

poorer reception generally than was regarding the twist of waves during

On the first test 64 per cent of the In order to study the comparison letters reported that the signal ob- between the two radiations for dis-

tsined from the horizontal antenna tance and direction we have made

transmission.

ters in each district which report the In addition to several soloists, a horizontal louder and the number monologist will be heard during this is placed inside the cabinet, will prewhich report the vertical louder. program.

This graphical summary makes the results very plain. There is a clear indication that the horizontal transmission gave better service to the zone from about sixty to 250 miles from Schenectady, while at greater distances the vertical seemed to improve and to become more satisfachad been hurled by the 'lectric juice tory. It seems, therefore, that hori- fortunates, but if the choice of the me and Billy decided we had an ur- zontal radiation may be of some others in Sing Sing is to be any ingent call elsewhere, and we lost no assistance as a special means of dication, it is safe to state that it

There are some other points which He might of had roomitism, but this test has shown us, but which In the case of the model prisoner NALYSIS of reports received from radio listeners on the com- that 'lectric shock sure cured him, are either too involved or still too who is without financial income from parative tests of horizontal and vertical radiation of radio judging from the way he was swingwaves from the superpower transmitter of the General Electric ing both feet at Rusty's poor old time. They will, however, be of

As I felt sorry for Rusty having ing in this novel program will be proper authority.

But I said to Billy later, "We Boy A tabloid operetta, "Peggy From Close-up of the principal set and also Paris," will be presented as the feafor performing our one good deed a ture of the "pop" concert to be broad- the Western Electric superheterop. m. The lyric of this operetta was composed by George Ade and the comchart which shows the number of let- position itself by William Loraine.

Radio Activities At Sing Sing

(Continued from page three)

broadcasting, although at the present runs to the sentimental, with music The last we saw of Rusty's dad he stage of development the gain is not and songs of long ago playing a prominent part in the list of selec-

assistance in planning future tests assistance in planning future tests radio fan, to get his own set. The state allows each prisoner a specified amount for his daily tasks. This watching her husband's kicking dem- The Air From WJZ To-night warden's office. True, it is but a small money is placed to his credit at the The radio audience is in for an sum, but when one takes into conthe air. The two artists participat- the prison with the permission of the

the famou 23d Regiment Band of No. 2 shows one of the prisoners who has crowded a set into his cell reports which did come in to us. A part due to the improper adjustment one who had a hand in forcing old 'Peggy From Paris' Tabloid No. 4 shows a trusty tuning in on Operetta in "Pop" Concert the main receiving set within the cast on Thursday from WEAF at 8:30 dyne, the power amplifier and the loop aérial.

> To Keep Coils Dry A cloth bag containing lime, if it

vent dampness in coils of a set.



501 Canadian Pacific Bldg.

Phone Murray Hill 4045-4046

Monday night

0:30 p. m.—Vincent hope. ii-12 p. m.—Dance orchestra. WJY—NEW YORK CITY—405

WGBS-NEW YORK CITY-316 10 a. m.—Timely talks with Terest. 10:10 a. m.—Gertrude Seidenman,

10:20 a. m.—"Household Economy"; picno 10:40 a. m.—Thrift talk; piano. 1:30 p. m.—Scripture reading. 1:35 p. m.—Fanille Davies, soprano; Francis Baldwin, cellist.
3 p. m.—Betty Ross, "The Holy Land," 3:10 p. m.—Hattie Strauss, soprano. 3:20 p. m.—Serena Hutsall, readings. 3:30 p. m.—Hattie Strauss. 3:40 p. m.—Piano lessons; songs. 6 p. m.—Uncle Geebee.

p. m.—Uncle Geebee.

30 p. m.—Billy E. Jones, pianologues.

40 p. m.—Arthur Kober and Henr.

Meyers. 50 p. m.—Charles Jones, "Salesmanship.

lack, piano recital.

330 p. m.—George Junior Republic.

340 p. m.—Paragon Novelty Trio, T Mohr, entertainers.

10:30 p. m.—Arrowhead Orchestra.

m.—Bert Dixon, tenor.
p. m.—William Nikow, tenor

songs. 30 p. m.—Harold Glenn, whistler.

2:30 p. m.—Harold Glenn, whistler.
2:35 p. m.—Vincent Daniels, pianist.
6:30 p. m.—Josephine Gillis, pianist.
6:40 p. m.—Sunshine talk.
7 p. m.—Dance orchestra.
7:30 p. m.—Oakland's Chateau Shanley.
8 p. m.—H. Streger, character artist.
8:30 p. m.—Piotti, Val and Lloyd, songs.
8:45 p. m.—Louisa Damese, solos.
p. m.—George Dowd, tenor.
9:15 p. m.—Ted Newkirk's Band.
0:30 p. m.—Ethel Dallon, songs.
9:45 p. m.—Follack and Yellen, songs.
11 p. m.—Caravan Orchestra.
11:30 p. m.—Bob Murphy's Orchestra.
12 (midnight)—Kentucky Revue and Orchestra.

WNYC-NEW YORK CITY-526

WNYC—NEW YORK CITY—526
7 p. m.—Market high spots.
7:10 p. m.—The Canadians.
7:30 p. m.—Police Alarms.
8 p. m.—Clarion Male Quartet.
8:20 p. m.—Martha Weiss, pianist.
8:40 p. m.—Clarion Male Quartet.
9 p. m.—Hjalmar Kober, pianist.
9:15 p. m.—Dinner tendered to the Rt. I Ernest M. Stres; toastmaster, Wm. Tu address, Bishop Thos. F. Gallor.
10:45 p. m.—Police Alarms; weather.

WMCA-NEW YORK CITY-341

WMCA—NEW YORK CITY—341

11 a. m.—"Homemaker's Hour."
6 p. m.—Olcott Vail's String Ensemble,
6:30 p. m.—Cinderella Dance Orchestra,
7 p. m.—Jack Wilbur's Personalities,
8 p. m.—Pace program,
8:15 p. m.—I'Two Hot Knights."
8:30 p. m.—Hye Sorensen, barytone,
9 p. m.—Alfred Orner, tenor,
9:15 p. m.—Silvia Fisher, contralta,
9:30 p. m.—Judith Roth, soprano,
9:40 p. m.—Jack Miller, violinist,
9:50 p. m.—Mifred Van Vilet, planist,

p. m.—Jack Miller, violinist.
p. m.—Mildred Van Vilet, pianist.
p. m.—Theodore Wright, barytone.
p. m.—Robert Borsig, tenor.
p. m.—Troubadours.
m.—Ernie Golden's Orchestra.

p. m.—Barnett's Orchestra. 45 p. m.—Lillian Koehler, soprano. p. m.—Railroad talk, Garrow Gee

WRNY-NEW YORK CITY-259

m.—Law series. m.—Ilonka's Kiddie Dances.

:55 p. m .-- Alexandre Zeitlin "Scripture

WFBH-NEW YORK CITY-273

p. m.—Current Theater. p. m.—Up and Down Broadway.

5.30 p. m.—Leo Ford, Dot McLean, songs, 5.30 p. m.—Leo Ford, Dot McLean, songs, 5.45 p. m.—Arthur Hand, barytone, 6 p. m.—Mina Rosen. 6.15 p. m.—Hotsy Hotsy Boys. 6.30 p. m.—Bossart Lumberjacks, 11.30 p. m.—Fordham Orchestra.

WLWL-NEW YORK CITY-288

WAHG-RICHMOND HILL N. Y .-- 316

WOR—NEWARK—405 6:45-7:15-7:45 a. m.—Gym class, 2:30 p. m.—"Piano Study," Fe Greenwald.

Greenwald.

3 p. m.—Julius Seebach, barytone

3:15 p. m.—Vincent Sorey Conce

Dudley 6:15 p. m.—Aerial Santa Claus.

12 m.—Luncheon music.
1:30 p. m.—"Arts and Decorations."
1:45 p. m.—Women's club hour.
6:55 p. m.—New York Neighborhoods.
7 p. m.—"Whose Birthday To-day?"
7:05 p. m.—Telegraph Sportflash.
7:10 p. m.—Commerce of the Day.
7:15 p. m.—Opera Notes.
7:20 p. m.—Usus series.

20 p. m.—Naomi Carper

WHN-NEW YORK CITY-361

:20 p. m.—Music; market report. :30 p. m.—Dairy Farming Course. :45 p. m.—Music.

6:30 p. m.—Dinner music; trio. 7:45 p. m.—Talk. WJAR—PROVIDENCE—306

1:05 p. m.—Studio program. 8 p. m.—Earl Shean's Orchestra. 9-11 p. m.—Program same as WEAF. WNAC—BOSTON—280

b. m.—Dinner dance.
b. m.—Dinner dance.
c. m.—Copley Plaza Orchestra.
c.—Entertainment from Charity Ball.
c. m.—Betropolitan grand orchestra.
c. m.—Dance music
WEEL—BOSTON—349

WBZ—SPRINGFIELD, MASS.—333

i:30 p. m.—Organ recital.

p. m.—Market reports.

':05 p. m.—"Psychology," Abrahm Myer

:80 p. m.—Capitol Theater Orchestra.

Nicholson.
p. m.—Copley Plaza Orchestra.
p. m.—Aleppo Drum Corps.
30 p. m.—Concert by artists.
0:05 p. m.—Lee Reisman's Orchestra.
WTAG—WORCESTER, MASS.—268

p. m.—Science talk. :15 p. m.—Story teller. -10 p. m.—Robin Hood's Orchestra.

0-11 p. m.—Grand opera, "Rigolet: WRC—WASHINGTON—469

4.30 p. m.—Musical program.

WCAP—WASHINGTON—469
6:45-7:45 a. m.—"Tower Health Exercises."
7-11 p. m.—Market summaries; Y. M. C. A.
Chorus; health talk; music by Gypsies

wbal—Baltimore—375

Talk; instrumental artists.
KDKA—PITTSBURGH—309

6:80 p. m.—Dinner concert. 8 p. m.—Ruud Light Opera Hour. 9 p. m.—Happy Home Hour. WCAE—PITTSBURGH—461

1:30 p. m.—Dinner concert.
1:30 p. m.—Children's period; talk.
2 p. m.—Nixon orchestra.

m.—Grand opera. m.—Loew's Aldine Theater. WEAR—CLEVELAND—390

—Allen Theater Orchestra. WTAM—CLEVELAND—390 Dinner music.
Orchestra and artists.

WADC-AKRON, OHIO-258

m.—Dinner concert.
WKRC—CINCINNATI—422

WJR PONTIAC MICH 517

m.—Dinner concert.
m.—Orchestra and soloists; Gypsies
WREO—LANSING, MICH.—386

Dinner concert. WBBM-CHICAGO-226

WMAQ-CHICAGO-448

Organ; La Salle Orchest a.—Family Altar League. WHT—CHICAGO—400

TUESDAY

WJZ-NEW YORK CITY-455

WJZ-NEW YORK CITY-455

1 p. m.—Women's hour.
1 p. m.—Nathan Aba's Orchestra.
2 4, 5:30, 7:30 and 10:30 p. m.—News.
1:15 p. m.—Florence Janos, soprano.
1:30 p. m.—Bernhard Levitow's Orchestra.
1:32 p. m.—Market quotations.
1:32 p. m.—Market quotations.
1:32 p. m.—Market quotations.
1:32 p. m.—Market quotations.
1:30 p. m.—Market quotations.
1:30 p. m.—N. Y. U. course: "Heat and Temperature," Professor H. H. Sheldon, 7 p. m.—Dog talk by Frank Dole of the New York Herald Tribune.
1:15 p. m.—Vanderbilt dinner concert.
1:30 p. m.—New York Edison hour.
1:30 p. m.—New York Edison hour.
1:30 p. m.—William Ballyn, songs.
1:30 p. m.—The grand tour: "Nortporn Italy."

Orchestra; soloists.
—Musical program.
—Musical program.

.:30 p. m.—Jewett Jesters. WWJ—DETROIT—353

7 p. m.—Classical program. 8 p. m.—Classics.

m.—Program from WEAF. n.-1 a. m.—Community program. WLW—CINCINNATI—122

nner concert; baskethall tall

WTIC-HARTFORD, CONN.-476

# The Herald Tribune Daily Broadcasting Programs for Week Ending December 12

Eastern Standard Time

#### TO-DAY

WJZ—NEW YORK CITY—455 m.—Children's hour: stories, m comic stories. 11 a. m.—West End Presbyterian Church services.

12:30 p. m.—Rivoll Sunday concert.

2:30 p. m.—Sunday radio forum.

3:30 p. m.—Yale Divinity School, "Religion and Social Science," Dr. Jerome Davis.

8:57 p. m.—Vesper services at St. George's Schurch.

Church.
545 p. m.—Literary vespers, "The Factor of Fate," Edgar Burrell
7 p. m.—Carillon of Park Avenue Baptist 7:30 p. m.—Nathan Abas's Orchestra. 8:15 p. m.—Joseph Knecht's Concert Or-

9:25 p. m.—John De Beuris, Basset Horn; WJY-NEW YORK CITY-405 p. m.-Bernhard Levitow's Orche 8:15 p. m.—Bernhard Levitow's Orchestra 10 p. m.—"Reminiscences of a Reporter, William H. Crawford.

WEAF—NEW YORK CITY—492
2-3 p. m.—Sunday radio service; Golden Rule Sunday, Address by John M. Moore. Handel's oratorio, "The Messiah."
3 p. m.—Young People's Conference. Address and Aida Brass Quartet.
3:45-5:30 p. m.—Men's conference at the Y. M. C. A.; address by Dr. S. Cadman, "Real Religion"; Salvation Army Band 7:20-9:15 p. m.—Capitol Theater Family.
9:15-10:15 p. m.—Atwater Kent Hour Maria Kurenko, soprano; Felix Salmond, violincello. WEAF-NEW YORK CITY-492 violincello.

10:15 p. m.—"The Golden Rule," "Red"
Grange, football star, speaking for Near
East Relief.

7:0.2

WGBS-NEW YORK CITY-316 8:30 p. m.—Program from Warner's Theater.
9:30 p. m.—Vanderbilt Orchestra.
10 p. m.—Mendelssohn Quintet Club and Orpheus Mixed Quartet.

Orpheus Mixed Quartet.

WMCA—NEW YORK CITY—341

11 a. m.—Christian Science services.
6 p. m.—Roemer's homers.
7 p. m.—Ernie Golden's Orchestra.
7:35 p. m.—Olcott Vail's String Ensem
8 p. m.—Weber Male Quartet.
10:30 p. m.—Talk, Bernays Johnson.
10:50 p. m.—Orchestra. WHN—NEW YORK CITY—361
5 p. m.—Roseland Dance Orchestra.
10:45 p. m.—Janssen's Orchestra.
12 a. m.—Harry Richman's Entertainer

WRNY—NEW YORK CITY—259
2:45 p. m.—Body fit talks.
5 p. m.—Music of all religions.
4 p. m.—Dr. Christian Reisner's hour.
5 p. m.—Becker String Quartet.
8:15 p. m.—Charles Isaacson's concert. WLWI.—NEW YORK CITY—288

p. m.—Paulist Choristers; sermon
Rev. John C. Smyth.

WFBH—NEW YORK CITY—273
5 p. m.—104th Field Artillery Band,
6 p. m.—Masonic news.
6 p. m.—Bossert Lumber Jacks.
7 p. m.—Perfection Pete.
7:30 p. m.—Franklin Four,
7:50 p. m.—Limericks.
7:55 p. m.—Franklin Four. WBBR-STATEN ISLAND, N. Y.—273

ford.

1 a. m.—Tenor and orchestra.

9 p. m.—Choral singers; violin duets.

9:15 p. m.—Bible lecture.

9:45 p. m.—Choral singers; violin duets.

10:05 p. m.—Choral singers; violin duets. WGBB—FREEPORT, N. Y.—244 10:40 a. m.—Church services.

WGOP—NEWARK—252

7 p. m.—Daddy Dingle.

8 p. m.—Leslie McLeod, tenor.

8:15 p. m.—Bernard Share, violinist.

8:30 p. m.—Madeline Freeman, soprano.

9 p. m.—Strickland's Orchestra. WIP—PHILADELPHIA—508

p. m.—"Passing the Buck." Re
talk by Josephus Daniels.

WOO-PHILADELPHIA-508 WEI-PHILADELPHIA-395 4:30 p. m.—Chapel service; mu: 7:30 p. m.—Services.
9:15 p. m.—Atwater Kent Honr.

WLIT—PHILADELPHIA—395 WCAU-PHILADELPHIA-278 WCAU—PHILADELPHIA—278
5:20 p. m.—R. Floyd Fox, basa.
5:35 p. m.—Radio church service.
5:55 p. m.—Recital; talk.
6:30 p. m.—Clarence Seaman's Orchestra.
7:30 p. m.—Cathay Concert Orchestra.
8:30 p. m.—Concert.
9 p. m.—Potash & Perlmutter; "Topics of the Day."

WHAR-ATLANTIC CITY-275 10:45 a. m.—Morning service, 2:15 p. m.—Short sacred recital, 2:45 p. m.—Sermon, Rev. Walter Brugge-

man. 7:50 p. m.—Evening service, 9 p. m.—Seaside Quartet. 11:15 p. m.—Strand organ recital. WPG—ATLANTIC CITY—300

WPG—ATAMARAN

3:15 p. m.—Organ recital.

4:15 p. m.—Community vocal and from mental recital.

9 p. m.—Concert orchestra.

10 p. m.—Organ recital, soloista. WRW-TARRYTOWN, N. Y.-273 8 p. m.—Services. 10:30 p. m.—American Novelty Orchestr 11:30 p. m.—Rialto Theater Orchestra. WGY-SCHENECTADY-380 II a. m.—Service 12:30 p. m.—Theater symphony orchestra.

12:30 p. m.—Theater symphony orchest 5 p. m.—Organ recital.
7 p. m.—Carillon program.
8 p. m.—First Unitarian Church servip p. m.—WJZ studio program.
10 p. m.—Godfrey Ludiow, violinist.
WGB—BUFFALO—319
3 p. m.—Vesper services.
7:45 p. m.—Evening service.
9:15-10:15 p. m.—Program same as WEL 10:15 p. m.—Program same as WEAF. WMAK—LOCKPORT, N. Y.—266

10:30 a. m.—Morning service. 7:30 p. m.—Evening service. WJAR—PROVIDENCE—306 7:20 p. m.—Capitol Family. 9:15 p. m.—Atwater Kent Radio Hour. 10:15 p. m.—Golden Rule, "Red" Grange. WNAC—BOSTON—280

11 a. m.—Memorial services.
1:30 p. m.—Concert.
3:15 p. m.—Meeting House Forum.
7:20 p. m.—Evening service.
8:45 p. m.—Mason & Hamlin concert.
WEEL—BOSTON.—349

WEEI-BOSTON-349

10:50 a. m.—Morning service.

2:30 p. m.—Organ recital.

3:45 p. m.—Dr. S. Parkes Cadman.

7:20 p. m.—Capitol Theater Family.

9:15 p. m.—Atwater Kent Hour.

10:15 p. m.—Golden Rule, "Red" Grang

WEZ-SPRINGFIELD, MASS.—333 WBZ—SPRINGFIELD, MASS.—333
10:50 a. m.—Church services; music.
7 p. m.—Sunday evening concert.
8 p. m.—Holy Cross College program.
WTAG—WORCESTER, MASS.—268
1:45-3:30 p. m.—"Resolved, that the U. S.
own and operate anthracite coal mines,"
St. Joseph College, negative; Holy Cross
College, affirmative.
3:45-5:30 p. m.—Men's Conference from
WEAF.
7:20

KDKA-PITTSBURGH-309 WCAE-PITTSBURGH-461 WADC-AKRON, OHIO-258

6.30

m.—Dinner music. WEAR—CLEVELAND—390 -Organ recital.
WLW-CINCINNATI-326 m.—Songs and services, m.—Classical program by artists. WJR—PONTIAC, MICH.—517

m.—Radio Frolic. WWJ—DETROIT—352 m.—Church services.
KYW—CHICAGO—536 KYW—CHICAGO—536

8 p. m.—Club services.
10:30 p. m.—Classical concert.
WLS—CHICAGO—345
7:30 p. m.—Organ solos; Little
Church.

WGN-CHICAGO-370 10 p. m.—Master artist concert, WHT—CHICAGO—400 11:30 p. m.—Request program. 11:30 p. m.—Back home hour. WOK—CHICAGO—217 7:30 to 9:30 p. m.—Concert a

music.
2 a. m.—Musical program.
WQJ—CHICAGO—447 9 to 11 p. m.—Rainbow Orchestra WENR—CHICAGO—266

9 to 11 p. m.-

9 p. m.—Mixed quartet; orbitial bells.
WOC—DAVENPORT—484
WOC—DAVENPORT—484 7:30 p. m.—Church services.
9:15 p. m.—Program from WEAF.
10:45 p. m.—Symphony Orchestra.
WSUI—10WA CITY—484
—Familiar hymns. 10:15 p. m.—Familiar hymns. KFMX—NORTHFIELD, MINN.—337

KTHS—HOT SPRINGS—375

MONDAY WEAF-NEW YORK CITY-492

WEAF—NEW YORK CITY—492

1:45 a. m.—Health exercises.

0:45 a. m.—Home service talk.

1:05 a. m.—Musical program.

1:15 a. m.—Talk.

1:30 a. m.—Columbia University lecture.

2 noon—Market and weather reports.

1:30-4:15 p. m.—Government Club meeting.

1:5-5 p. m.—Columbia University lecture-recital: Dorothy Scarborouch and Ole recital: Dorothy Scarborough and Ola Gulledge; Negro folk songs. p. m.—Dinner music. p. m.—Music.

1.15 p. m.—"Theater Guild," Theresa Helburn.

25 p. m.—Music. 30 p. m.—'Lullaby Lady." 7:30 p. m.—"Lullaby Lady."
8 p. m.—"Pop" concert.
8:30 p. m.—David Berend, banjoist.
8:45 p. m.—Health talk.
9 p. m.—Music by Gypsies.
10-11 p. m.—Grand Opera "Rigoletto."
11-12 p. m.—Ben Bernie's Orchestra.

WJZ-NEW YORK CITY-455

WJZ-NEW YORK CITY—200

10 a. m.—Women's hour.

1 p. m.—Meyer Davis's music.

2, 4, 5; 30, 7; 30 and 11 p. m.—News.

4:20 p. m.—Emiline Bosse, soprano.

4:20 p. m.—Dr. Daniel Goodwill, barytone.

4:30 p. m.—Tric Concert.

5:32 p. m.—Market quotations.

5:50 p. m.—Financial summary.

6:30 p. m.—New York University course

"How to Be Happy," Professor Charle
G. Shaw.

7 p. m.—Bernhard Levitow's Orchestra.

8 p. m.—Revelers.

9 p. m.—Larry Siry's Orchestra.

9:36 p. m.—St. Nicholas Society banque

Bishop William T. Manning, James Elde

11 p. m.—Harry Leonard's Orchestra.

WGBS—NEW YORK CITY—316

WGBS-NEW YORK CITY-316 10 a. m.—Timely talks with Terese. 10:10 a. m.—Jack Cohen, planist. 10:20 a. m.—"Truth in Advertising Talk" piano. 10:40 a. m.—Fashion talk; piano. 1:30 p. m.—Scripture reading.

10:40 a. m.—Fashion talk; plano,
1:30 p. m.—Scripture reading.
1:35 p. m.—Rosalie Blanchard, Walter
Croft, duets.
2 p. m.—Bob Platz, Murray Miller, duets.
3 p. m.—Interview with Evelyn Wight.
3:10 p. m.—Dorothea Aber, soprano.
3:40 p. m.—League of Women Voters.
3:50 p. m.—Dorothea Aber, soprano.
6 p. m.—Uncle Geebee.
6:30 p. m.—Premier Orchestra.
7 p. m.—The New Astrology."
7:10 p. m.—Premier orchestra.
WNYU—NEW YOUR CHIVE FOR

6:10 p. m.—Market bigh

6:20 p. m.—Plano selections.
6:30 p. m.—Elementary German lesson.
6:30 p. m.—Elementary German lessons.
7:30 p. m.—Police alarms.
7:35 p. m.—Castle Orchastra.
8:10 p. m.—Chris Meehan, tenor.
8:30 p. m.—Josephus M. Daniels,
Challenge of Peace"; Arthur Skr
violinist.
10:30 p. m.—Police alarms; weather.

WMCA—NEW YORK CITY—341
6 p. m.—Olcott Vail's String Ensemble.
6:30 p. m.—Talk on "Lacquer."
7 p. m:—Ernie Golden's Orcehstra.
7:30 p. m.—Edward French, planist.
8 p. m.—Eamly Circle.
8:30 p. m.—The Harmony Boys.
8:45 p. m.—Radio program.
9 p. m.—Lecture on Christian Science.
10:15 p. m.—Dance orchestra.
11:15 p. m.—Elliott Pfionin, barytone.
11:30 p. m.—Jack Cohen, planist.
WHN—NEW YORK CITY—261

WHN—New YORK CITY—361
2:15 p. m.—Marion Smith, planist.
2:30 p. m.—Harry Stone's Orchestra.
6 p. m.—Dinner music.
6:30 p. m.—Daddy Dingle.
6:45 p. m.—Dinner music.
7 p. m.—Trio concert.
7:30 p. m.—Joe Ward's Entertainers.
8 p. m.—'Storage Batteries," H. Shontz.

songs.
0:30 p. m.—Frivolity Orchestra.

midnight—red Levis.

WFBH—NEW YORK CITY—273

. m.—Bernard's N. Y. Six.

5. m.—Volley Endriss, contralto.

15. p. m.—Studio program.

30. p. m.—Orchestra.

p. m.—Orchestra.

p. m.—Tracy and Moore, songs.

115. p. m.—Katherine Adolphe, soprano.

1245 p. m.—Maerican Legion news.

125 p. m.—Judith Roth, songs.

125 p. m.—Bert Dixon, tenor.

126 p. m.—Abner Silver, composer.

11:30 p. m.—Abner Silver, composer.

11:30 p. m.—Alvin Hauser's "At FParty."

9 p. m.—Musical. 9:30-11 p. m.—Fight between Goodrich and Rocky Kansas.

WRNY-NEW YORK CITY-259 p. m.—New books in review. p. m.—Orchestra. :15 p. m.—Daddy Dingle. p. m.—"Whose birthday to-day?"

m.—"Whose birthday to-day?"
p. m.—Telegraph sportflash.
p. m.—Commerce of the day.
p. m.—Commerce of the day.
p. m.—Captain D'Arte.
p. m.—Major Dent Atkinson, "Travel."
m.—Ferrucci's Orchestra.
p. m.—"Evolution of Jazz."
p. m.—Celeanor Dugas, "Painting."
p. m.—Ferrucci's Orchestra.
p. m.—Ferrucci's Orchestra. WNAC—BUSTUN—260

9:15 a. m.—Christmas carols.

10:30 a. m.—Bible readings; club talks.

12:15 p. m.—Organ recital.

1 p. m.—Shepard Colonial concert.

4 p. m.—Copley Plaza Trio.

6 p. m.—Kiddies Klub. p. m.—Ferrucci's Orchestra.
p. m.—"Jazzing Sonate Pathefique.'
n.—"Stellar Space," Hugo Gernsback
o. m.—Music travelogue.
p. m.—Svanhilde.
p. m.—John Agostini, violin dances.
m.—Poetry nost

10 p. m.—Poetry post. 10:10 p. m.—Bob Schafer and Fred Fisher WEEL—BOSTON—349
6:45 a. m.—Health exercises,
10:45 a. m.—Home Service talk,
2 p. m.—Happy Hawkins Orchestra,
6:50 p. m.—Lost and found; weather,
7 p. m.—Big Brother Club.
7:45 p. m.—Santa Claus,
8 p. m.—Carter's program,
8:30 p. m.—Talk on "Business Education,
8:45-10 p. m.—Program same as WEAF,
10 p. m.—Scotty Holmes Orchestra; ban
concert. songs. m.—Rose Dreeben, poet peasant. 10:35 p. m.—Florence Gerringer, planist. 11:15 p. m.—Radio Theater Players. WOKO-NEW YORK CITY-233 7:45 p. m.—Rigley's Versatile Sere 8:15 p. m.—Martha Welss, pianist. 8:35 p. m.—Jeanie A'Dair, soprano. 8:50 p. m.—Frank Galassi, pianist. 9:05 p. m.—University Orchestra.

p m.—Irene Kleinpeter, soprano, 10 p m.—World news digest, 20 p m.—Vocal duets, 30 p m.—Bible instruction, 40 p m.—Fred Franz, tenor; duets. WAHG-RICHMOND HILL, N. Y.-316

7:30 p. m.—Maurice E. Connolly.
7:45 p. m.—Broadway Harmony Kings.
8:15 p. m.—Martha Brauninger, soprano.
8:30 p. m.—Horace Taylor, recitations.
8:45 p. m.—Synchrophase Trio.
9 p. m.—Radio Santa Claus.
9:15 p. m.—Doris Sheldon, contralto.
9:30 p. m.—Synchrophase Trio.
10 p. m.—Doris Sheldon, contralto.
10:15 p. m.—Joe Zimmerman's Orchestra.
12 midnight—Dance music.

WCRR\_URFERPORT N. V. 244 WGBB-FREEPORT. N. V -- 244 m.—Crescent City Trio.
p. m.—Arthur Henley, barytone,
p. m.—Jack McAllister, ukelele.

9 p. m.—Talk. 9:10 p. m.—Frank Marone's Orchestra 10 p. m.—Bob Hildenbrand's Orchestra WOR.—NEWARK—405
6:45-7:15-7:45 a. m.—Gym class
2:30 p. m.—Oreste's Queensland Orch
3:15 p. m.—Jack Smith, barytone.
3:30 p. m.—Phil Cook, songs.
3:45 p. m.—Beauty talk.
6:15 p. m.—Beauty talk.
6:15 p. m.—Weard Santa Claus.
6:25 p. m.—Words misproneused

p. m.—Words mispronounced. p. m.—"Sports," Bill Wathey, p. m.—Jacques Jacobs's Ensemble, p. m.—Dance orchestra, m.—"Current Topica," H. V. Kalte; born. 8:30 p. m.—"Al Reid's Hour." 9:45 p. m.—"Carthage," Edward Blerstadt 11 p. m.—The Banjo Boys. 11:15 p. m.—Oklahoma Red, hobo storie: 11:30 v. m.—Irving Aronson's Crusaders. WAAM-NEWARK-263

m.—Happy hour program.
m.—Ben Goldfarb's Orchestra; talk.
m.—Joe Chickene's Orchestra. 1.50 p. m.—The Sport Oracle.
1.45 p. m.—Alice Downs, contraite.
1.50 p. m.—Alice Lowers, contraite.
1.50 p. m.—Jimmie Lowery, xylophe.
1.50 p. m.—Alice Laurie, soprana.
1.50 p. m.—Talk, Horace E. Beaver.
1.50 p. m.—Bouts from the ringside at

WGCP-NEWARK-252 3 p. m.—Piano solos; race results (half hourly),
3:30 p. m.—Pendleton and Moore entertainers. m.—Jack Davis, Shirley Herman.

1:46 p. m.—Jack Davis, Shirley Herman.
4:80 p. m.—Uncle Robert's pals.
5 p. m.—Joe Sherman, Lew Pollack.
5:15 p. m.—Judith Roth, soprano.
6:15 p. m.—Schwartz's Orchestra.
6:50 p. m.—Schwartz's Orchestra.
6:50 p. m.—Perry Bradford entertainers.
8:30 p. m.—Perry Bradford entertainers.
8:45 p. m.—Mohr and Tracey, songs.
9 p. m.—Carl Guenther's Orchestra; song
9:40 p. m.—Bob Ward's Little Wards.
10 p. m.—Strickland's Orchestra.
11 p. m.—Connie's Orchestra. WIP-PHILADELPHIA-505

WOO-PHILADELPHIA-508

m.—"Your Hour."
p. m.—David Berend, banjoist,
p. m.—"The Radio Dream Girl."
m.—Music by gypsies,
m.—Grand opera, "Rigoletto."
m.—Dance music. WEI-PHILADELPHIA .........

WFI—PHILADELPHIA

10:30 a. m.—Solos; service tall

1 p. m.—Tea room ensemble.

3 p. m.—Talk and solos.

3:45 p. m.—Fashion feature.

6:30 p. m.—Concert orchestra.

7 p. m.—Dance orchestra.

WLIT-PHILADELPHIA-395 2 p. m.—Organ rectat, sciences, cert orchestra.
2 p. m.—Concert orchestra.
4:30 p. m.—Talk, the Rev. A. Spe :30 p. m.—Dream Daddy.

WEAF—NEW YORK CITY—499 6:45-7:45 a. m.—Health exercises. 11 a. m.—May Breen and Peter de Rose, songs.

11:35 a. m.—Motion picture forecast.

11:55 a. m.—Songs.

11:10 a. m.—Lecture.

11:25 a. m.—May Breen, Peter de Rosse 11:25 a. m.—may Breen, 12:2 noon—Market and weather reports.
12 noon—Market and weather reports.
4 p. m.—New York Society Trio.
4:30 p. m.—Women's program.
6 p. m.—Dinner music.
7 p. m.—Walter Preston, barytone.
7 10 p. m.—Columbia University French
lecture. WCAU-PHILADELPHIA-278 lecture.
7:30 p. m.—Davis Saxophone Octette.
8 p. m.—"Financial Events," DudlFowler.
8:10 p. m.—Ritz Male Quartet.
8:30 p. m.—Gold Dust Twins.
9 p. m.—"Eveready Hour."
10 p. m.—Radio auction bridge game.

3 p. m.—Recital.
9:10 p. m.—Nokol Man.
9:30 p. m.—Delaware County Serenaders.
10 p. m.—Tom Houston, James Loughrey,
Don Travaline, songs.
10:30 p. m.—The Parodians WPG-ATLANTIC CITY-300 30 p. m.—Afternoon tea music.
45 p. m.—Organ recital.
p. m.—Trio dinner music.
p. m.—Children's hour.
45 p. m.—Studio program. m.—Dance orchestra.
WHAR—ATLANTIC CITY—275

p. m.—Theater orchestra. m.—Eastman Theater organ.

Hayner, contralto. :30 p. m.—Concert Recital.

p. m.—Theater orchestra.

WHAZ—TROY, N. Y.—380
p. m.—Calvin Dater, barytone; Gladys

45 p. m. — "Purification of Stream Water," Dr. William Masdn. p. m.—Kalteaux's Kollegians Orchestra WMAK—LOCKPORT, N. Y.—266

30 p. m.—Song recital. 9 p. m.—Murray Whiteman Serenaders p. m.—Musical.

Dance Orchestras for This Week p. m.—Seaside Trio.
30 p. m.—Fashlon review.
p. m.—Seaside Trio.
WGY—SCHENECTADY—380 p. m.—Asia Orchestra.
0 p. m.—Music; household talks.
0 p. m.—Dinner program. 2:30 p. m.—Music; household talks.
6:30 p. m.—Dinner program.
7 p. m.—WGY agricultural program.
7 p. m.—WGY agricultural program.
7 p. m.—Wargaret DeGraff, harpist;
Earl Hummel, violinist; "Literary Appreciation," William Diddemer.
WGR—BUFFALO—319
6:30 p. m.—Dinner music.
8:30 p. m.—Dinner music.
9 p. m.—Symphonic Saxophone Band.
10 p. m.—Concert.
11 p. m.-1 a. m.—Supper music; organ recital. Station Length Orchestra WGCP 252 Strickland's WHN 361 Janssens's cital. WHAM—ROCHESTER, N. Y.—278

MONDAY, DECEMBER 7

WNYC 526
WHN 361
Dance music
Guenther's
WEEI 349
WGCP 252
WJZ 455
WEEI 349
WGCP 252
WJZ 455
WGCP 252
WJZ 455
WGCP 252
WJZ 455
Unance music
Strickland's
VGCB 244
VAHG 316
Dance music
Dance music
LAT 395
IT 395
IT 395
Archie Slater's
Dance music
AF 492
Ben Bernie's
Ben Bernie's
WEEL 349
WGCP 252
WILL 2000 Archie Slater's
Dance music
WGCP 252
WGCP 252
WGCP 252
WILL 2000 Archie Slater's
Dance music
WGCP 252
WGCP 252 11-1 am WGR 11:30 WOR

WHN 361 Dance music WAHG 316 Dance music TUESDAY, DECEMBER 8 Arrowhead Candadians Highland 316 526 273 405 455 492 316 800 492 361 273 469 Highland
Paul Specht's
Mayflower
Vincent Lopez's
Arrowhead
Dance music
Dance music
Dance music
Ernie Golden's
Fordham
Meyer Davis's WEDNESDAY, DECEMBER 9 Ramblers
Eisenhuth's
Dance music
Arcadia
Glenn Smith's
Dance music
Virginians
Dance music

THURSDAY, DECEMBER 10 Dance music Orlando's Cinderella Palisades Larry's Band Joe Ray's Wanderbilt Dance music Meyer Davis's Ernie Golden's Jacques Green's Vincent Lopez's Dance music WGBS 316
WRNY 259
WMCA 341
WGCP 252
WOKO 233
WIP 333
WGBS 316
WHN 361
WRC 469
WMCA 341
WJZ 455
WEAF 499
WHO 300
WHN 361 Dance my FRIDAY, DECEMBER 11 WGCP 252 WJY 405 WAAM 263 WHN 361 WHYC 526 WRNY 259 WLIT 395 Cheatham's
I. Abrams
Stewart's
Bance music
Colonial
Ed Berlin's
Dance music

11-12 WEAF 492 11:30 WHN 861

WAAM 263 WAHG 316 WJZ 3616 WOO 508 WGBB 244 WJAR 806 WEAF 319 WTIC 476 WHN 861 WFBH 273 Clockmakers Dance music Fordham SATURDAY, DECEMBER 12 Amphions
Ben Bernie's
Cinderella
Homaker's
Dance music
Arrowhead
Paul Specht's
Vincent Lopez's
Ernie Golden's
Dance music
Strickland's
Dance music
Dance music

WCAE-PITTSBURGH-461

WADC-AKRON, OHIO-258 WTAM-CLEVELAND-390 WEAR-CLEVELAND-390

WGCP-NEWARK-252

3 p. m.—Songs; race results (haif hourly)
3:15 p. m.—Charles Phillips, Osborne and
Meredith, Isabelle Henderson and One
Welsh, songs.
4:15 p. m.—Ukulele Bob McDonald.
4:30 p. m.—Leslie McLeod, tenor.
5 p. m.—Herbert Polesie, recitations.
5:15 p. m.—songs.
7 p. m.—Daddy Dingle.
8 p. m.—Studio program. WAAM-NEWARK-263 1 a. m.—Happy Hour; cooking school.
3 p. m.—Al Makon's Orchestra; talk.
4 p. m.—Joe Brown, tenor.
4 p. m.—Haurice Greenburg, tenor.
5 p. m.—Fefie Hanson, soprano.
5 p. m.—113th Infantry Band.
6 p. m.—West Orange Night. WSAI—CINCINNATI—326
7:30 p. m.—Davis Saxophone Octet.
8 p. m.—Orchestra.
9 p. m.—Program from WEAF.
10 p. m.—"Auction Bridge Games."
10:30 p. m.—Concert from studio. WLW-CINCINNATI-422

WOO-PHILADELPHIA-508 1 a. m.—Grand organ; 2 noon—Luncheon music. 1:45 p. m.—Grand organ; trumpeta 1:30 p. m.—Davis Saxophone Octet. WIR-PHILADELPHIA-508 11 p. m.—Dance music; songs. 12 midnight—Alvin Roehr's Orchestr. WJR—PONTIAC, MICH.—617

p. m.—Artist recital.

105 p. m.—Joe Ray's Night Hawks.
p. m.—Roll call and birthday list.
p. m.—Elliott Lester, dramatic critle.
115 p. m.—Musical Club opera class.
p. m.—Dr. Harvey Dee Brown.
110 p. m.—Musical Club opera class.
10:05 p. m.—'Emo's Movie Broadcast.'
10:30 p. m.—Joe Ray's Night Hawks.

WEIT\_PHILA DEE PHIA 2016 WFI—PHILADELPHIA—395

1 p. m.—Tea Room Ensemble.
3 p. m.—Music Club Chorus.
6:30 p. m.—Concert orchestra.
7 p. m.—Dance orchestra.
8-11 p. m.—Program same as WEAF.

WLIT-PHILADELPHIA-395 11 a. m.—Organ Recital. 12:05 p. m.—Organ; religious services orchestra.

2 p. m.—Concert orchestra; recital.

4:30 p. m.—Republican Women of Penn

regivania; recital.
7:30 p. m.—Plays reviewed.
WCAU—PHILADELPHIA—278 7:30 p. m.—Recital.

8 p. m.—Bulding and Loan talk,
8:10 p. m.—School of Oratory Players,
9:25 p. m.—School of Oratory Players,
9:15 p. m.—Robert Fraser, singer,
10:30 p. m.—Billy Hayes' Orchestra,
WGP—ATLANTIC CITY—300

WGP—ATLANTIC CITY—
1:30 p. m.—Luncheon music,
8:45 p. m.—Organ recital.
7 p. m.—Trio dinner music,
8 p. m.—Fashion Flashes,
8:15 p. m.—Plaza Artists,
9 p. m.—Trio concert,
10 p. m.—Lyric Male Quartet,
11 p. m.—Dance prophetts. m.—Dance orchestra.
WHAR—ATLANTIC CITY—273 p. m.—Strand Organ Recital, WGY—SCHENECTADY—380

p. m.—Music; address. 30 p. m.—Organ recital. 30 p. m.—Dinner progra: 30 p. m.—Address. Larrabee.

Larrabee.

15 p. m.—WGY Orchestra.

15 p. m.—WGY Orchestra; songs.

0 p. m.—WGY Orchestra; songs.

10 p. m.—The Grand Tour—Norther Italy.

10:30 p. m.—Mayflower Orchestra.

WGR—BUFFALO, N. Y.—319

0 p. m.—Eastman Theater Orchestra p. m.—Theater orchestra. WTIC—HARTFORD, CONN.—476 10 p. m.—Dinner music.
p. m.—Frances Nearing, contralto.
p. m.—Symphonic Ensemble.
30 p. m.—A Musical Travelogue.

m.—Organ recital.
WJAR—PROVIDENCE—306 WJAR-TRUVIDENCE
1:30 p. m.—Concert orchestra.
1:30 p. m.—Mayflower Quintet.
8:05 p. m.—Mayflower Quintet.
8:05 p. m.—Gold Dust Twins.
9 p. m.—Eveready Hour.
WEEI-BOSTON—349.

WEEF-BOSTON 349.
6:45 a. m.—Health exercises.
2 p. m.—Eugene's Orchestra.
6:50 p. m.—Lost and found; weather.
7 p. m.—Big Brother Club.
7:45 p. m.—Harvard Observatory talk.
8:11 p. m.—Program same as WEAF.

15 p. m.—Boston American Orchestra. WBZ—SPRINGFIELD, MASS.—333

p. m .- Broadcast of profess p. m.—Broadcast of Legion program.
game.
0.005 p. m.—American Legion program.
WTAG—WORCESTER, MASS—268
10.30 a. m.—Musical selections; talk.
12 noon—Market and weather reports.
12.05-2 p. m.—Luncheon music.
5.15 p. m.—Story Teller.

—Program same as WEAF.

110 p. m.—Story Teller,

1-11 p. m.—Program same as WEAF,

WRC—WASHINGTON—469

0 a. m.—Women Hour frim WJZ,

2 noon—Organ recital,

p. m.—Washington Orchestra,

p. m.—Hamilton Orchestra,

50 p. m.—'Show Shopping," Leon

Hall. p. m.—Lee House Trio. :30 p. m.—"Political Situation ington." ington."
p. m.—N. Y. Edison Hour.
10 p. m.—"The Grand Tour."
10:30 p. m.—Mayflower Orchestra.
11:30 p. m.—Organ recttal.
12 midnight.—Meyer Davis's Band.
WBAL—BALTIMORE, MD.—375

m.—Wormack's Singing Syncopa n.—Studio concert. n.—Loew vaudeville and music. m.—Opera, "Marthe."

p. m.—Trirdyn Trio; Mary Barbara p. m.—Military band concert.

7 p. m.—Orchestra; soloists. 9 p. m.—Serenaders; soloists. WWJ—DETROIT—353 6 p. m.—Dinner concert. 8 p. m.—Program from WEAF. WREO—LANSING—286

6 p. m.—Dinner concert. 8:15 p. m.—Band; glee club; artists. WHT—CHICAGO—400 p. m.—Classical recital. 345 p. m. (238 meters)—Alamo Orci

10:30 p. m.—Entertainers.

WMAQ—CHICAGO—448
7 p. m.—Organ; La Saile Orchestra.
9 p. m.—Book talk; music.
10:20 p. m.—Travel talk; university lectricized by m.—Metropolitan Glee Club.

WLS—CHICAGO—345
7:15 p. m.—Organ; WIS—Trio.

WLS-CHICAGO 345
7:15 p. m.—Organ: WLS Trio.

8 p. m.—Dinner concert.
8:33 p. m.—American farm speeches.
9 p. m.—Musical program.
10 p. m.—Concert program.
11 p. m.—'Evening at Home.\*
2 a. m.—Insomnia Club.

WEBH—CHICAGO 370
8-9 p. m.—Dinner concert somes talk 8-9 p. m.—Dinner concert; songs; talk, 10 p. m.—Dance selections; theater bits, 12-2 a. m.—Dance music; song.

WGN—CHICAGO—370

7:30 p. m.—Dinner music.
9:30 p. m.—Classic hour.
11:30 p. m.—Dance music.
11:30 p. m.—Dance music.
WOK—CHICAGO—217

6-8 p. m.—Concert hours.
11 p. m.—Musical features.
WIBO—CHICAGO—226 WHO—CHICAGO—220
7-9 p. m.—Songs by artists,
1-4 a. m.—Midnight Jamboree.
WENR—CHICAGO—266
7 p. m.—Dinner concert.
9-11 p. m.—All-American Ploneera.
WQJ—CHICAGO—448

8 p. m.—Dinner concert.
11 p. m.—Rainbow Skylarks.
2 a. m.—Ginger Hour.
WCRD—ZION, ILL.—345

9 p. m.—Ladies' chorus and artists WBBM—CHICAGO—226 m.—Orchestra; artists.
m.-1 a. m.—Concert and orchestra.
WJJD—MOOSEHEART—303

1 a. m.—Sitting-up hour.

WOC—DAVENPORT—484

8 p. m.—Educational farm talks.
8:30-10:30 p. m.—Program from WEAF.
10:30 p. m.—Travel lecture.
11:15 p. m.—Girla Glee Club.

#### WEDNESDAY

WJZ-NEW YORK CITY-455 WJZ—NEW YORK CITY—455

10 a. m.—Women's hour.

1 p. m.—Irwin Abrams's Orchestra.

2, 4, 5:30, 7:30 and 10:25 p. m.—News.

4:30 p. m.—Sarah Case, soprano.

4:30 p. m.—Joseph Knecht's music.

5:32 p. m.—Market quotations.

5:50 p. m.—Financial summary.

6:30 p. m.—Penancial summary.

6:30 p. m.—New York Course—"Psychoogy of Study," Prof. James Lough.

7 p. m.—Bernhard Levitow's concert.

8:30 p. m.—Lewisohn Free Chamber Musconcert.

10 p. m.—Alexander Brachocki, planist. 10:30 p. m.—Virginians.

WEAF—NEW YORK CITY—492
6:45 a. m.—Health exercises.
10:45 a. m.—Home service talk.
11:05 a. m. Hazel Dudley, soprano.
11:15 a. m.—"The Nervous Child in Reality."
11:30 a. m.—Columbia University lecture.
12 noon—Market and weather reports.
4 p. m.—Olga Field, soprano.
4:15 p. m.—Ray Nichols's Orchestra.
4:45 p. m.—Ult Gems," Helen Ballard.
6 p. m.—Dynagogue services. 6 p. m.—Dinner music.
7 p. m.—Synagogue services,
7:30 p. m.—United States Army Band.
8 p. m.—The Beddies.
8:30 p. m.—Pooley concert.
9 p. m.—Troubadours.
10 p. m.—Roxy's Gang.

11-12 p. m.—Ben Bernie's Orchestra. WNYC—NEW YORK CITY—526 6:10 p. m.—Market high spots. 6:20 p. m.—Plano selections. 6:30 p. m.—Elementary Spanish lessons.

7:35 p. m.—Walter Scott, VALL...
8:30 p. m.—Walter Scott, VALL...
Dowd, tenor.
9:30 p. m.—Pyramid Entertainers.
10:10 p. m.—"Glory of Work," Winte Russell.
Police alarms; weather.

Jos. Chickene's Eisenhuth's

(Harlem Night)
p. m.—"Growth of Harlem," Curtis
Reard Eeard.
8:10 p. m.—Bill Brown's Brownies.
8:20 p. m.—Songs and band.
9 p. m.—Address, H. R. Hartley.
9:05 p. m.—George Meyers's Orchestra.
9:15 p. m.—Songs and orchestra.
9:45 p. m.—Hilson Sisters, songs.
9:55 p. m.—George Meyers's Orchestra.

WHN-NEW YORK CITY-361 WHN-NEW YORK CITY-361
2 p. m.—Jimmy Clarke, planist.
2:10 p. m.—Nehmia Jacobson, barytone.
2:20 p. m.—Wolly Endrise, contralto.
2:30 p. m.—William Rietz, tenor.
6 p. m.—Dinner music.
6:30 p. m.—Daddy Dingle.
6:45 p. m.—Dinner music.
7 p. m.—Ted Lewis's Orchestra.
7:30 p. m.—Eve Darlon, songs.
7:40 p. m.—Robert Leland, charact stories.

stories.
7:50 p. m.—Eva Rothenberg, pianiste.
9 p. m.—Versatile Serenaders.
10:30 p. m.—Frivolity Orchestra.
11 p. m.—Orchestra.
11:30 p. m.—Melody Orchestra.

12 p. m.—Cotton Orchestra. 12:30 a. m.—Harry Richman's Entertain-WMCA—NEW YORK CITY—341 6 p. m.—Olcott Vail's String-Ensemble.
6:30 p. m.—Ernie Golden's Orchestra.
7 p. m.—'The Uses of Lacquer."
7:10 p. m.—Ernie Golden's Orchestra.
7:30 p. m.—Spanish lesson.
7:45 p. m.—Jose Bohr, songs.
8 p. m.—'The Florida Boom."
8:15 p. m.—Dr. King's Northminster services.

9:15 p. m.—"Your Job," Frank Wadsworth.
9:30 p. m.—Audubon Theater.
11 p. m.—Entertainers.
11:30 p. m.—Jack Smith, barytone.
8 p. m.—Young Men's Hebrew Associati
9:30 p. m.—Musical program,
WBZ—SPRINGFIELD, MASS.—333
6:30 p. m.—Leo Reisman's Ensemble.
7 p. m.—Market reports WRNY-NEW YORK CITY-259

WEST-NEW YORK CITY-259
12 (noon)—Luncheon music.
1:30 p. m.—Dr. Block, "Paralysis."
1:45 p. m.—Fred Wandschneider, monica.
6 p. m.—Orchestra.
6:15 p. m.—Waddy Dingle.
7 p. m.—"Whose Birthday To-day?"
7:05 p. m.—Telegraph Sportflash.
7:10 p. m.—Commerce of the day.
7:15 p. m.—Opera notes.
7:20 p. m.—Merryle Rukeyser "Finance"
7:45 p. m.—Merryle Rukeyser "Finance"
7:45 p. m.—Merryle Rukeyser "Finance"

WCAP—WASHINGTON—469
7-11 p. m.—Market summaries;
States Army Band from WEAF;
dies;" "Ipana Troubadours," "Gang."
KDKA—PITTSBURGH—309 9:20 p. m.—Francine Vyde, repertoire. 9:30 p. m.—Leon Simon, barytone; Wymar

Miller, cello.

p. m.—Chevalier de Lancelletti's concert.

WFBH—NEW YORK CTTY—273 8:30 p. m.—Dinner concert. 8:30 p. m.—Plectrum Trio. WCAE—PITTSBURGH—461

wffh-New York CITY-273
p. m.—Orchestra.
p. m.—Orchestra.
p. m.—Orchestra.
p. m.—Orchestra.
p. m.—Original Indiana Five.
p. m.—Grace Strassburger, contraction of the p. m.—Concert. WADC—AKRON, OHIO—258 6:30 p. m.—Dinner concert. WTAM—CLEVELAND—300 WAHG-BICHMOND HILL, N. Y .- 316

WAHG—BICHMOND HILL, N. Y.—31
12 noon—Musical program.
7:36 p. m.—Helen Krentzlin, soprano.
7:45 p. m.—Reo Ramblers.
8:15 p. m.—Banjo Eddie.
8:45 p. m.—Raymond Maher, barytone.
9 p. m.—Radio Santa Claus.
9:15 p. m.—Alfred Wertheim, violinist.
9:30 p. m.—Arthur Cole, tenor.
9:45 p. m.—Alfred Wertheim, violinist.
10 p. m.—Herman Fisher, readings.
10:15 p. m.—Glenn Smith's Orchestra.
WGRR—FREEFPORT N. W. 244 p. m.—Dance music. WEAR—CLEVELAND—390 p. m.—Dinner concert. WKRC—CINCINNATI—422 9 p. m.—Book review. 9:15 p. m.—Dance music; popular 10 p. m.—Symphony orchestra. WSAI—CINCINNATI—326 8:45 p. m.—Art talk.
9-11 p. m.—Program from WEAF.
11 p. m.—Quartet and soloists.
WLW—CINCINAIT—422
m.—Dinner concert; Farm Cou

WGBB-FREEPORT, N Y-244 8:10 p. m.—Hollis Smith, barytone.
8:10 p. m.—Helen Pearsall, pianist.
8:25 p. m.—Frances Kiernan, soprano.
8:40 p. m.—Cora Griffen, contraito.
8:55 p. m.—Helen Pearsall, pianist.
9:15 p. m.—Cherie Harrison, soprano.
9:30 p. m.—Royal Trio.
10 p. m.—Billy Eisenhuth's "Lynbrocklyne."

lyns."

WOR—NEWARK—405
6:45, 7:15, 7:45 a. m.—Gym class.
2:30 p. m.—Children's Theater program.
3 p. m.—Bessie Brown, songs.
3:15 p. m.—Bessie Brown, songs.
3:15 p. m.—Archie Slater's Orchestra.
6:15 p. m.—Words Mispronounced."
6:27 p. m.—"Words Mispronounced."
6:27 p. m.—"Sports," Bill Wathey,
6:37 p. m.—Jacques Jacobs's Ensemble,
7:30 p. m.—Zit's Casino Orchestra.
8 p. m.—Topics of the Day."
8:15 p. m.—The Royal Trio.
8:36 p. m.—Sam Siegel, mandolin.
8:46 p. m.—The Royal Trio.
9 p. m.—Ballin and Race, piano duo.
9:15 p. m.—"Familiar Words and Phrases
9:30 p. m.—Intercity Meet Rotary Clul
Don Adams, speaker.

12-2 a. m.—Dance music; songs.
12-2 a. m.—Dance music; recital.
8 p. m.—Dinner concert.
8:33 p. m.—Talks.
9 p. m.—Musical program.
11 p. m.—Midnight revue.
11 a. m.—Organ; 2 a. m., Insomnia Club.
WIBO—CHICAGO—226 11 p. m.—Popular program. WGN—CHICAGO—370

30 p. m.—Intercity Don Adams, speaker WAAM-NEWARK-263 8 p. m.—Rainbow Orchestra,
11 p. m.—Rainbow Skylarks,
2 a. m.—Ginger Hour,
WOK—CHICAGO—217

WAAM—NEWARK—263

11 a. m.—Happy hour.

3 p. m.—Gus Steck's orchestra; talk.

7 p. m.—Xay Nichols's orchestra.

7:30 p. m.—The Sport Oracle.

7:45 p. m.—Ben Friedman, Dick Finch.

9 p. m.—Alice Rinck, violinist; Florence Yordy, soprano; Flora Benson.

1 p. m.—Naborhood Merchants' Program.

1:30 p. m.—Helena Parrill, soprano.

1:45 p. m.—Fanny Horowitz, pianist.

0 p. m.—Bill McWalters, tenor.

WGCP—NEWARK—252 11 p. m.-2 a. m.—Musical features. WLS—CHICAGO—345 1:15 p. m.-1 a. m.—Organ; story; Rode

p. m.—Bill McWalters, tenor.

WGCP—NEWARK—252
p. m.—Piano; race results (half hourly 45 p. m.—Morris Zimmerman, violinist. 15 p. m.—Good news party. 30 p. m.—Songs by artists. p. m.—Harmony group. 30 p. m.—Streger Character Players. p. m.—Hock and Jerome, songs. 15 p. m.—Charol de Thomee, planist. WIP-PHILADELPHIA-508 145 a. m.—Setting up exercises.

10:30 a. m.—Reducing exercises.

11. p. m.—Luncheon music.

p. m.—Artist recital.

05 p. m.—Dinner music.

35 p. m.—'Farm Boy Makes Good."

p. m.—Bedtime story; songs. WOO-PHILADELPHIA-508 noon—Luncheon music.
45 p. m.—Grand organ; trumpets.
30 p. m.—Dinner music.
p. m.—United States Army Band.
30 p. m.—Pooley concert.
p. m.—American Male Quartet.
p. m.—Theater Studio Program. WFI-PHILADELPHIA-395 0:30 a.

30 a. m.—Solos; Home Service
p. m.—Tea Room Ensemble,
p. m.—Songs and book chats,
15 p. m.—Fashion feature,
10 p. m.—Concert orchestra,
p. m.—Dance orchestra, WLIT-PHILADELPHIA-395 m .- Organ; religious service chestra. D. m.—Arcadia Concert Orchestra.

30 p. m.—Talk; artist recital,
30 p. m.—Talk; artist recital,
30 p. m.—Concert music.
30 p. m.—Chorus, Henry Hols.
30 p. m.—Playlet.
0 p. m.—Arcadia Dance Orchestra. WCAU—PHILADELPHIA—278 :45 p. m.—The Parodians, p. m.—"Prevention of Diphtheria."

WGY-SCHENECTADY-380

Melgier, organist.

WHAM—ROCHESTER, N. Y.—278

30 p. m.—Eastman Theater Orchestra.

p. m.—Theater organ.

p. m.—Theater orchestra. p. m.—Weather; market report. WMAK—LOCKPORT, N. Y.—266 7:30 p. m.—Musical program. 8 to 9 p. m.—Musical program. WCAC—MANSFIELD, CONN.—275 p. m.—Music; market report, p. m.—"How Plants Live."

Writers of Comedy," Professor Ralph Magoffin.

7 p. m.—Judge Jr.

7:20 p. m.—Shoreham Concert Orchestra.

8 p. m.—United States Army Band.

9 p. m.—Royal Salon Orchestra.

10 p. m.—"Europe and Ourselves," Herbert A. Gibbons, at dinner of Military Order of Foreign Wars.

11 p. m.—Jacques Green's Orchestra.

with Colonial Aces. p. m.—Music. WTIC—HARTFORD, CONN.—476 WJY-NEW YORK CITY-405
7:30 p. m.—Vanderbilt Concert Orchestra,
8:15 p. m.—"The Horse in Literature,"
Harry Smith.
8:25 p. m.—Gordon James, barytone;
Edith Rudolph, contralto. WJAR—PROVIDENCE—306

1:05 p. m.—Stud o program.
7:30 p. m.—U. S. Army Band.
9 p. m.—Musical program.
10 p. m.—'Roxy's Gang.'
3 p. m.—Johnnie Bowles's Orchestra.
6:50 p. m.—Lost and found; weather.
7 p. m.—Big Brother Club.
7:45 p. m.—Talk.
8 p. m.—Buddies.
8:30 p. m.—Musical program.
10 p. m.—Musical program.
10 p. m.—Trov sadours.
WNAC—BOSTON—280
9:15 a. m.—Christmas carols.

p. m.—Dinner concert; Farm Council. p. m.—"Pep" concert. :30 p. m.—Zither players; trio; quarter

m.—Dance orchestra.
WJR—PONTIAC. MICH.—517

30 p. m.—Jesters. WREO—LANSING, MICH.—286

m.—Dinner concert. m.—The classic hour.

wmAQ—CHICAGO—448

meters).
10:30 p. m.—Organ recital,
1 a. m.—Your Hour.
WBBM—CHICAGO—226

6:45 p. m.—Chime concert. 10 p. m.—Musical program.

9-11 p. m.—String trio; song; orchestra. 1-3 a. m.—Artists and orchestra selection WOC—DAVENPORT—484

THURSDAY

linist.

8 p. m.—Oakland's Chateau Shanley.

8:30 p. m.—Guardian Entertainers.

9 p. m.—Jimm' Clarke, planist.

9:10 p. m.—Hartnedy Trio.

10:30 p. m.—Kentucky Orchestra.

1:30 p. m.—Bob Murphy's Orchestra.

2 midnight—Ted Lewis's Orchestra.

WEBH—CHICAGO—370

n.—Goldkette's Orche n.—Burroughs Hour.

Edith Rudolph, contraito.

WGBS—NEW YORK CITY—316

10 a. m.—Timely Talks with Terese.
10:10 a. m.—Mrs. H. Byles, contraito.
10:20 a. m.—Household talk; songs.
10:40 a. m.—"Better Homes" talk; songs.
1:30 p. m.—Scripture Reading.
1:35 p. m.—John Warman, harmonica.
1:45 p. m.—Anna Seeley, soprano.
2 p. m.—Ben Hyams, pianist.
3 p. m.—Woman in the Home Hours tenor solos.
6 p. m.—Unde Contraited.

3 p. m.—Woman in the Home Hours tenor solos.
6 p. m.—Uncle Geebee.
6:30 p. m.—Bob Davis' Novelty Trio.
6:50 p. m.—What the World Le Doing."
7 p. m.—Voltaire Hour of Music.
8 p. m.—Dance orchestra.
8:30 p. m.—Book and Play Review.
9 p. m.—Irving Argay, wiolinist.
9:30 p. m.—Y. M. C. A. program.
10 p. m.—Andrades Lindsay, Lydia.
Mason, pianists. m.—Kiddies Klub.
p. m.—Checker Inn Dinner Dance.
p. m.—Boston Federation of Churci
m.—Young Men's Hebrew Associat.
n. m.—Musical Engaran 7 p. m.—Leo Reisman's Enseman's p. m.—Market reports.
7 p. m.—Market reports.
7:05 p. m.—Don Ramsay's Four.
7:30 p. m.—Radio Nature Story.
8 p. m.—Piano recital.

Mason, pianists.

10:10 p. m.—Josephine Harris, soprano.
10:20 p. m.—Andrades Lindsay, Lydis
Mason.
10:30 p. m.—Vanderbilt Orchestra. 8 p. m.—Piano recital. 8:15 p. m.—Pauline Clark, concert. 9:30 p. m.—Dean Works Quartet. WTAG—WORCESTER, MASS.—268 WNYC—NEW YORK CITY—526
6:50 p. m.—Market high spots,
7 p. m.—Jean Cireno's Orchestra,
7:30 p. m.—Jean Cireno's Orchestra,
7:35 p. m.—Jean Cireno's Orchestra,
8 p. m.—Jean Cireno's Orchestra,
8 p. m.—Cantor Solomon Binhorn;
Birdie Zlotolow, violinist.
6:40 p. m.—Josef Wohlmann, pianist,
9:20 p. m.—"Goff" interview, Eddie Sullivan, Johnnie Farrell,
9:35 p. m.—Hilda Reich, soprano; Joseph
Wiesner, barytone, WTAG—WORCESTER, MASS.—200 10:30 a. m.—Musical selections; talk, 12 noon—Market and weather report. 12:05-2 p. m.—Luncheon music. 4:45 p. m.—"Story Teller." 7:40 p. m.—Spanish lesson. WRC-WASHINGTON-469

tra. 2, 4, 5:30, 7:15 and 10:30 p. m.—News. 4:05 p. m.—Ethel Rea. 50075.

tra.
5:32 p. m.—Market quotations.
5:50 p. m.—Financia

Wiesner, barytone.
10:15 p. m.—"Trend of the Times."
10:35 p. m.—Police Alarms; weather. WFBH-NEW YORK CITY-273

2 p. m.—Studio program.
3 p. m.—Gerhart's Orchestra.
4 p. m.—Radiovues, Mrs. Owen Kildare.
4:30 p. m.—Billy Cohen's Hottentots.
5:30 p. m.—Tracy and Moore, songs.
5:45 p. m.—Ralph Giannattassio.
6 p. m.—Elizabeth Heslop, contraite.
6:15 p. m.—Sammy Wilson, pianist.
6:45 p. m.—Philip Wolfe, talk.
7 p. m.—Tremont Radiophone Entersitalners.
7:30 p. m.—The Pinewalders.
WMCA—NEW YORK CITY—341 WMCA-NEW YORK CITY-341

WMCA—NEW YORK CITY—341
6 p. m.—Olcott Vail's String Ensemble.
6:30 p. m.—Frank Gobbia's Orchestra.
7 p. m.—Violet Kaye, stories.
7:15 p. m.—Pace program.
7:17 p. m.—Violet Kaye, stories.
7:30 p. m.—Lanson's Orchestra.
8 p. m.—Samuel Heller, readings.
8:30 p. m.—Cinderella Dance Orchestra.
9 p. m.—Regalbuto Sisters, duets.
9:30 p. m.—Ensedden Weir, barytone.
10 p. m.—How to Drive Automobiles.
10:03 p. m.—To be announced.
11 p. m.—Ernie Golden's Orchestra.
12 midnight—Cast of "Merry Merry," special performance.
WRNY—NEW YORK CITY—259

WRNY-NEW YORK CITY-259 1:30 p. m.—Mrs. Rose Berry, "Painting." 

7:30 p. m.—Jerome Alexander; Deyie Sisters.
7:45 p. m.—Madeleine Hulsizer, soprano.
8 p. m.—Orlando's Orchestra.
8:30 p. m.—Radio questions and answers.
8:45 p. m.—Life's jokes.
9 p. m.—Jerome Lama, musical saw,
9:15 p. m.—Lorna Lee, song girl,
9:30 p. m.—Essay on philosophy,
9:35 p. m.—Bill Rietz, songs.
9:45 p. m.—Classic Theater.
10 p. m.—Velga Trio.

9:45 p. m.—Classic Theater. 10 p. m.—Volga Trio. 11:15 p. m.—Radio Art Players. WLWI.—Nedo Art Players.

WLWI.—NEW YORK CITY—288

p. m.—Duet: Rhea Leddy, William J.
Flusk.
9:30 p. m.—Talk.
9:50 p. m.—Musical program.
10:15 p. m.—Marriage and Divorce, Joseph H. McMahon.
10:35 p. m.—Willy Stahl, violinist.

WOKO-NEW YORK CITY-233 der, songs.

WAHG—RICHMOND HILL, N. Y.—316 12 noon—Musical program. WOR—NEWARK—405 6:45-7:15-7:45 a. m.—Gym class. 2:30 p. m.—Frances Pehl, planist. 2:45 p. m.—"English Bulldog,"

Little.

3 p. m.—Bernstein Sisters Trio.

3:30 p. m.—Al Wilson's Playmates.

6:15 p. m.—Aerial Santa Claus.

6:25 p. m.—Words Mispronounced.

6:27 p. m.—'Sports,' Bill Wathey.

6:37 p. m.—Jacques Jacobs's Ensemble.

7:20 p. m.—News Bulletin. WAAM-NEWARK-263

11 a. m.—Happy Hour. 6 p. m.—Tom Cooper's Orchestra; talk. WGCP—NEWARK—252

3 p. m.—Race results (half hourly). Bert
Dagmar, Doris Freeman, Ramos, Helen
Dalzell, songs.

1:15 p. m.—Frank Gallasi, ukelele.

4:30 p. m.—Gertrude Greenblatt, vicilnist.

4:45 p. m.—Sylvia Schatz, Harry Spear,
songs.

4:45 p. m.—Sylvia Schatz, Harry Spear, songs.
5:15 p. m.—Joe Kahn's Orchestra.
8:30 p. m.—Eva Rothenberg, pianologue,
8:45 p. m.—Bert Dixon, barytone.
9 p. m.—Palisade Dance Orchestra.
9:30 p. m.—Judith Roth, soprano.
19:45 p. m.—O'Brien Bros., guitars.
10 p. m.—Osborne and Meredith, songs.
10:10 p. m.—Hughie Woolford, planist.
10:20 p. m.—Piotti and Val, songs.
10:35 p. m.—Constantine Ramos, same-phonist.

WEAF—NEW YORK CITY—492
6:45-7:45 a. m.—Health exercises.
11 a. m.—Harriet Spink, soprano.
11:10 a. m.—Harriet Spink, soprano.
11:25 a. m.—Harriet Spink, soprano.
11:25 a. m.—Harriet Spink, soprano.
11:30 a. m.—Columbia University lecture.
12 noon—Market and weather reports.
4 p. m.—Madeleine Hulsizer, soprano.
4:15 p. m.—Mildred Silverman, pianist.
4:30 p. m.—Leslie Arnold, barytone.
4:45 p. m.—"Feed the Birds," Mrs. Mabel
Applebaum.
6 p. m.—Dinner music.
7 p. m.—Mildweek Hymn Sing; Herbert
F. Laflamme, field secretary.
7:30 p. m.—Serenaders.
8:20 p. m.—Pop Concert.
9 p. m.—Cliquot Eskimos.
10 p. m.—Goodrich Zippers.
11-12 p. m.—Vincent Lopez's Orchestra.
WHN—XEW WOKK CITY—361
2 p. m.—Charles Coleman, pianist.
2:15 p. m.—Lack Cohen, pianist.
6:30 p. m.—Jack Cohen, pianist.
6:30 p. m.—Jack Cohen, pianist.
7:30 p. m.—Dance orchestra.
7:30 p. m.—Donce orchestra.
7:30 p. m.—Denshine Talk
7 p. m.—Dance orchestra.
7:30 p. m.—Denshine Talk
7 p. m.—Denshine Talk
8 p. m.—Oakland's Chateau Shanley. phonist. 10:45 p. m.—Lulu Weyant, songs. 11 p. m.—Strickland's Orchestra. WOO-PHILADELPHIA-508

11 a. m.—Grand organ.

12 nodom—Luncheon music by Geiden's
Crystal Tea Room Orchestra.

4:45 p. m.—Grand organ; trumpets.

7:30 p. m.—Dinner music.

WIP—PHILADELPHIA—508
6:45 a. m.—Setting-up exercises.
10 a. m.—Menu.
1 p. m.—Luncheon music.
3 p. m.—The Celeste Trio.

8:15 p. m.—Pagoda Orchestra.
7 p. m.—Roll Call; hirthday list.
8 p. m.—The Sesqui-Centennial."
8:15 p. m.—Etude Hour.
9 p. m.—Penn Mutual Glee Club.
10:05 p. m.—Joe Ray's "Night Hawks." (Continued on next page)

#### Radio Engineers 500 Strong Attend I.R.E. Convention

On Monday and Tuesday of last week approximately 500 members of the Institute of Radio Engineers attended their regular annual meeting and first annual convention, which was held at the Engineering Societies Building, 29 West Thirty-ninth Street, New York City.

After the customary registration of delegates and distribution of badges, which took place Monday at 9 a. m. in the lobby, those present gathered in the auditorium on the third floor for the first session of the convention. The meeting was opened by the retiring president, Dr. John Howard Dellinger, who presented a report of the institute activities during 1925. This was followed by a report of the election of the institute officers for 1926, who are as follows: Donald McNicol, president; Dr. Ralph Brown, vice-president; Dr. J. H. Dellinger, junior past president; Dr. A. N. Goldsmith, secretary. and W. F. Hubley, treasurer. The president-elect and vice-presidentelect were introduced to the conven- N. Y. Symphony Orchestra | the orchestra, which will be heard

The board of direction prepared a

radio engineer of the Westinghouse Electric and Manufacturing Company, for the most noteworthy contribution to radio engineering during the last year. This was in recognition of his work in the development of short wave signaling.

The technical paper presented at this meeting was by Greenleaf W. Pickard on "The Polarization of Radio Waves." Mr. Pickard, who is consulting engineer for the Wireless Specialty Apparatus Company, told with the aid of slides, of his experiments and the facts about radio waves which he was able to gather

At 2 p. m. on Monday the delegates started on an organized trip of in spection of the new high-power radio broadcasting station of the Radio Corporation of America at Bound Brook, N. J. This trip required the remainder of the afternoon.

At the evening session a symposium on the results of the November. 1925, Washington Radio Conference was presented and the views of Dr. J. H. Dellinger, Dr. A. N. Goldsmith, J. V. L. Hogan and R. H. Marriott

On Tuesday morning the delegates had a choice of two tours, the first of which left the Engineering Societies Building at 9 a. m. in busses and included an inspection of the manufacturing plant of the A. H. Grebe Company, Richmond Hill, L. I.; station WHAG, Richmond Hill, L. I.; the transocean radio telegraph office of the Radio Corporation of America, New York City, and the studio of WJZ, New York City.

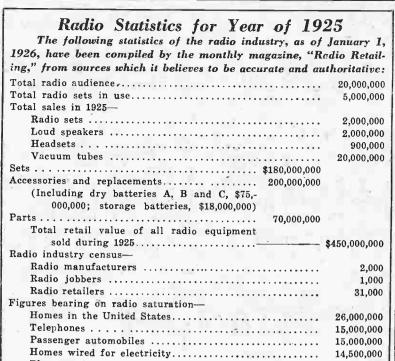
Another tour left the Engineering Societies Building at 9:30 a. m. in busses and included a visit to the transocean radio telegraph office of the Radio Corporation of America, the studio of station WEAF and the Telephone laboratories.

Both tours returned to the headquarters of the convention at 4 p. m. in time to hear the lecture by Dr L. W. Austin, which was entitled "The Present Status of Radio Atmospheric Disturbances." This paper is printed in full elsewhere in this magazine.

The convention was brought to formal close on Tuesday evening at a banquet which was held at the Waldorf-Astoria Hotel. Addresses on radio topics were made by many prominent radio engineers and executives, including Dr. M. I. Pupin, Dr. Irving Langmuir, Dr. F. B. Jewett. Dr. E. F. W. Alexanderson, Dr. A. E. Kennelly, Edward J. Nally, Professor J. H. Morecroft and A. H. Grebe.

"Miss Simplicity" Revived in Tabloid Form in Pop Concert

The audiences of two broadcasting stations, WEAF, New York, and WOO. Philadelphia, will hear the half-hour program known by the familiar title, "Pop" concert, to be broadcast at 8 o'clock to-morrow evening. On this evening the old comic opera, "Miss Simplicity," composed by Harry L. Hertz, and a favorite in the field of musical comedy less than a quarter of a century ago, will be revived in tabloid form by the quartet which i heard each week in this outstandingly popular feature of WEAF's program.



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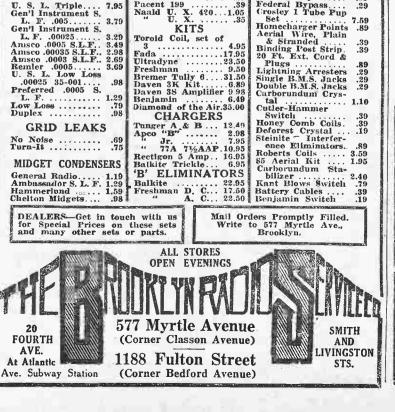
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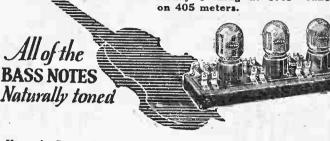




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"The Sine of Merit"



**ORANGE AND BLUE** 



# THE NEW YORK HERALD NewYork and Tribune RADIO MAGAZINE

SECTION ELEVEN

SUNDAY, JANUARY 24, 1926

## Radio Causes Downfall of 'Yellow Fangs'

Roger Wharton, the Dreamer of Hopedale, Circumvents a Wily Wolf and Thereby Earns Enough to Buy Receivers for Himself and His Chum

By CHARLES A. HARTLEY



Then a cautious forefoot came out, soon followed by another. Then the shoulders. Yellow Fangs wanted to know what was

devilish wolf, Yellow Fangs, has been at , broke in. "Drat his hide, I'd go five dolit again. He killed one of my finest heifers last night. That's enough to make a man angry from center to circumference. There's got to be something done about this destructive beast. I honestly believe he has killed five hundred dollars worth of stock in the county. I say there's got to be something done about it and that right away."

Farmer Peck stormed up and down for a few seconds he was so agitated.

"I agree that there ought to be an end put to the depredations of this beast. We exterminate the brute. So far as I am Fangs.

lars on a reward pot for his capture."

Roger Wharton, eighteen, the dreamer of the village of Hopedale, sat on a keg of nails back in a corner and listened to this tale of woe. He had heard about the wolf before. For three years it had been roaming up and down over two or three townships and living off the fat of the herds. Attempts had been made to run it down with dogs. It rended the dogs. Some one saw it one day in the act of slaying a sheep and its fangs were reported to be two inches long and yellow. might get in some experienced hunters and | That is the way it got the name of Yellow

Dogs were afraid of it; that is, the ones which were not killed or so badly mangled that all the fight had been taken out of them. Hunting parties were organized and armed and searched the woods for miles around. Yellow Fangs had a nose too acute to be caught in that way. He did not come out from his hiding place when there was snow on the ground. He was wise and wilv.

This boy dreamer, Roger Wharton, was also wise in woodcraft and in the ways of woodfolk generally. He had a pretty good knowledge of the animal family, wild and

He knew, for instance, that the ringing

Peck got to his feet and was in the act of shaking hands, when the dreamer boy (Continued on page seven)

things in the world to happen to Yellow

Fangs, went to talk the matter over with

County Agent Whitely of the local Farm

Bureau. He was determined to bring

about some organized effort to get rid of

Yellow Fangs was a stray. There had

not been a wolf in Dodge County for years.

It was generally believed that he had

escaped from a traveling managerie or

had drifted in from the mountain county

from the north and found things so well to

his liking that he had decided to take up

his residence in Dodge County as long as

Farmer Peck strode off cracking his

heels on the ground like he was in deep

earnest. Young Wharton followed along

after him, whittling a pine sliver he had

picked up. He slipped into the Farm

Bureau office without attracting especial

attention. Agent Whitely nodded to the

boy when he entered and took a seat in

Farmer Peck stated his grievance in few

and emphatic words. He wanted that wolf

killed and no more foolishness about it.

As a member of the organization he was

willing to stand his share of \$100 reward

Agent Whitely fell in with the idea and

it was agreed that the reward should be

published in the county paper that week.

When the two were about to separate,

after further discussion of the matter, to

which Wharton listened carefully, Farmer

for the capture of the night prowler.

things came his way.

the rear of the room.

Additional Radio News Will Be Found in Section Two of To-day's Herald Tribune

#### Radio Engineers 500 Strong Attend I.R.E. Convention

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After the customary registration of delegates and distribution of badges, which took place Monday at 9 a. m. in the lobby, those present gathered in the auditorium on the third floor for the first session of the convention. The meeting was opened by the retiring president, Dr. John Howard Dellinger, who presented a report of the institute activities during 1925. This was followed by a report of the election of the institute officers for 1926, who are as follows: Donald McNicol, president; Dr. Ralph Brown, vice-president; Dr. J. H. Dellinger, junior past president; Dr. A. N. Goldsmith, secretary. and W. F. Hubley, treasurer. The president-elect and vice-presidentelect were introduced to the conven- N. Y. Symphony Orchestra the orchestra, which will be heard

The board of direction prepared a testimonial which was presented to stations will send out as the eve- be the second time since the "At-Dr. Goldsmith. It his speech of ac- ning's "Atwater Kent Radio Hour" a water Kent Radio Hour" began on ceptance he told an interesting story program by the New York Sympnony Sunday, October 4, that an orchestra about how the institute was organ- Orchestra, under the direction of the has been heard, for it will be recalled ized sixteen years ago and of the famous Walter Damrosch. Radio that on the evening of Sunday, Nogreat struggle to keep it going during listeners will be particularly inter- vember 22, the New York State

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At the evening session a symposium on the results of the November. 1925, Washington Radio Conference was presented and the views of Dr. J. H. Dellinger, Dr. A. N. Goldsmith, J. V. L. Hogan and R. H. Marriott were given.

On Tuesday morning the delegates had a choice of two tours, the first of which left the Engineering Societies Building at 9 a. m. in busses and included an inspection of the manufacturing plant of the A. H. Grebe Company, Richmond Hill, L. I.; station WHAG, Richmond Hill, L. I.; the transocean radio telegraph office of the Radio Corporation of America. New York City, and the studio of WJZ. New York City.

Another tour left the Engineering Societies Building at 9:30 a. m. in busses and included a visit to the transocean radio telegraph office of the Radio Corporation of America, the studio of station WEAF and the Bell Telephone Isboratories.

Both tours returned to the headquarters of the convention at 4 p. m in time to hear the lecture by Dr L. W. Austin, which was entitled "The Present Status of Radio Atmospheric Disturbances." This paper is printed in full elsewhere in this magazine.

The convention was brought to formal close on Tuesday evening at a banquet which was held at the Waldorf-Astoria Hotel. Addresses on radio topics were made by many prominent radio engineers and executives, including Dr. M. I. Pupin, Dr Irving Langmuir, Dr. F. B. Jewett, Dr. E. F. W. Alexanderson, Dr. A. E. Kennelly, Edward J. Nally, Professor J. H. Morecroft and A. H. Grebe.

#### "Miss Simplicity" Revived in

Tabloid Form in Pop Concert The audiences of two broadcasting stations, WEAF, New York, and WOO Philadelphia, will hear the half-hour program known by the familiar title, "Pop" concert, to be broadcast at 8 o'clock to-morrow evening. On this evening the old comic opera, "Miss Simplicity," composed by Harry L. Hertz, and a favorite in the field of musical comedy less than a quarter of a century ago, will be revived in tabloid form by the quartet which is heard each week in this outstandingly popular feature of WEAF's program.

#### Radio Statistics for Year of 1925

The following statistics of the radio industry, as of January 1, 1926, have been compiled by the monthly magazine, "Radio Retailing," from sources which it believes to be accurate and authoritative: Total radio sets in use...... 5,000,000 Total sales in 1925-Loud speakers ...... 2,000,000 Vacuum tubes ..... 20,000,000 Accessories and replacements...... 200,000,000 (Including dry batteries A, B and C, \$75,-000,000; storage batteries, \$18,000,000) Total retail value of all radio equipment sold during 1925..... - \$450,000,000 Radio industry census-Radio manufacturers Radio jobbers ..... 1.000 Radio retailers ..... 31,000

Homes in the United States.....

Passenger automobiles .....

Homes wired for electricity.....

Farms in the United States.....

Radio sets now in use on farms.....

igures bearing on radio saturation-

Under W. Damrosch To-day direct from the well known Waldorf This evening fifteen broadcasting Astoria in New York City. This will the first few years of its existence. ested in knowing that Mr. Damrosch Symphony Orchestra broadcast direct The Liebmann Prize and \$500 were will make brief explanatory remarks from the Astor Galleries of the Wal-

14,500.000

10.000.000

6.500.000

#### GREATEST SALE EVER HELD **AERO-**CROSLEY

\$60.00 SUPER TRIRDYN SPECIAL

LOOP Silencer of Static and Interference. Sturdily built, compact and very portable. Will Fit Any Set.

\$10.50 Performance Master

\$90.75 In original carton.

**BARGAINS** PRICE PRICE
... \$8.00 \$3.98 17-in. Bell \$30.00 \$15.95

|                                                                                                                                                                           | Factory<br>guarantee                              | Add 1                            | 21-in. Bell \$35.00 \$15.95<br>0% on Mail Orders            |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|----------------------------------|-------------------------------------------------------------|
| PHONES, LOUD SPEAKER UNITS randes Superior 2.98 over Spitflers 1.95 orrison Unit 3.40 tach No. 10. 2.39 twater Kent 6.95 da 6.49 letograph Unit 8.95 romberg Carlson 7.00 | DIALS—\ Select, 3 in., Kurtz Karse Bell, 3 in., P | /ERNIER plain29 h, 4 in49 lain25 | "B" ELIMINATOR PARTS General Radio No. 366 Trans            |
| aldwin Type H 4.98 immons 2.98                                                                                                                                            | Lincoln Tap<br>Lincoln Tap<br>R.C.A. Loop         | ned 4.98                         | RATHEOSTATS  De Jur, all sizes. 3.89  Stasco, all sizes. 49 |
| SPEAKERS                                                                                                                                                                  | Gee                                               |                                  | Bradleystats 1.49<br>Amperites, all sizes79                 |
| yder No. 18 13.50<br>arrand Sr 32.50<br>arrand Jr 16.50                                                                                                                   | Comsco Dou                                        | ble 49c                          | SOCKETS<br>Bell U. X                                        |
| rofessional, 50 List 9.49<br>ew Radiola in stock                                                                                                                          | TRANSFO                                           | Tics 5.95                        | Benjamin 69c<br>Triple                                      |
| rosley Musicone 11,98<br>osch Ambotone 24,50<br>barm Cone 12,50                                                                                                           |                                                   | 65A 2.98                         | Eby U. X 49c                                                |

RESISTANCES VOLTMETERS Sterling 0-50 volts 1.79
Sterling 0-120 volts 2.49
Sterling 0-35 amps, 0-50 volts .... 2.49
Sterling 0-35 amps ... 79
Sterling 0-35 amps ... 69
Yankee Voltmeter ... 69 Leak
Cutler Hammer Grid
Leak
Bretwood
1.

MISCELLANEOUS
Acme Ratheon Kits37.00
Fada Pot, 200 Ohms .39
Aerovox 6 Ohm Rheo .29
Call Books .39
Talking Tape .69
Federal Bypass .29
Crosley 1 Tube Pup Set .759
Homecharger Points .89
Aerial Wire, Plain & Stranded .39
Binding Post Strip .39
20 Ft. Ext. Cord & Plugs .89 **ADAPTERS** KITS Foroid Coil,

U. S. L. Triple.... 7.95 Gen'l Instrument S. L. F. .005..... 3.79 Gen'l Instrument S Gen'l Instrument S.
L. F. 90025 ...
Anisco .0005 S.L.F.
Anisco .0003 S.L.F.
Amsco .0003 S.L.F.
Kemler .0006 ...
U. S. L. Low Loss
.00025 35-001 ...
Preferred .0005 S.
L. F.
Low Loss
Duplex Bremer Tully 6...3
Daven 3K Kit....
Daven 3S Amplifier enjamin ....... 6.49 iamend of the Air.35.00 CHARGERS GRID LEAKS " Jr. ...... 7.95
" 77A 7½AAP.10.95 MIDGET CONDENSERS Rectigon 5 Amp. 16.95
Balkite Trickle 6.95
General Radio 119 B' ELIMINATORS

DEALERS-Get in touch with us

FOURTH

At Atlantic

CONDENSERS

Mail Orders Promptly Filled. Write to 577 Myrtle Ave.,

SMITH



# At WOR Last Night

educational with not one second of "drag." Mr. Marriott, past president of I. R. E., spoke to you in your own language and told you a story that most of you are not acquainted with—the story of Radio's "lost notes."

The Daven Amplifier is the Unit That Enables You to Hear ALL the Music—Base and High Notes with Equal Distinctness

> This was clearly demonstrated last night from WOR and will be continued every Saturday evening at 8:45—tune in

All of the BASS NOTES Naturally toned

Have the Daven Service Dealer Install Daven Amplification for you

Ace Electric Co., Inc., 204 W. 34th St. Ferris Radio Supply Co., Inc., 3180 B'way Willis Radio Stores, 362 Willis Ave Ressiter, Tyler & McDonell, Inc., 136 Liberty St. Wireloss Egert, 179 Greenwich St. Holns & Bolet, 44 Park Place Charles W. Downs, 711 Eighth Ave. Interstate Radio Manufacturing Co., 1909 Ams.erdam Ave.

Imperial Economy Radio Co., 81 Cortlandt St. Brown Radio Laboratories, 82 W. B'way Haynes-Griffin, Inc., 41 W. 43d St. Radio Hospital, 39 Eighth Ave. Radio Construction 71 W. Broadway Orr Sport Shop, 112 Chambers St BROOKLYN, N. Y.

Stores of Brooklyn Radio Service Co.: 577 Myrtle Ave. 20 Feurth Ave. 1188 Fulton St. 573 Myrtle Ave. NEWARK. N. J.

Empire Light Co., Inc., 52 Springfield Ave. Ace Radio Shop, 217 Washington St. Dreher Radio, 315 Amsterdam Ave.

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Resistor Specialists





# THE NEW YORK HERALD NewYork RADIO MAGAZINE

SECTION ELEVEN

SUNDAY, JANUARY 24, 1926

### Radio Causes Downfall of 'Yellow Fangs'

Roger Wharton, the Dreamer of Hopedale, Circumvents a Wily Wolf and Thereby Earns Enough to Buy Receivers for Himself and His Chum

By CHARLES A. HARTLEY

ARMER HIRAM PECK, from out | concerned I am in favor of the Farm on Stony Point Creek, came into | Bureau offering a reward of one hundred the store of John Hoskins at Hopedollars for his capture," acquiesced Merdale with anger oozing from every pore chant Hoskins, going on and his chin whiskers bristling.

"Howdy, neighbor," saluted the merchant, just then in the act of weighing out a pound of nails for Sarah Smith, who dry good counter by that stood across at another counter fingering a bolt of gingham goods. "Hope you are feeling as fine as usual this morning; how's everything out about the Five Roads Settlement?"

"Huh, bad enough," snorted Farmer

"What's wrong?" asked the merchant, pausing with the nails dribbling from his hand into the scale scoop.

"Plenty," was the response. "That

Then a cautious forefoot came out, soon followed by

it again. He killed one of my finest

heifers last night. That's enough to make

a man angry from center to circumference.

There's got to be something done about

this destructive beast. I honestly believe

he has killed five hundred dollars worth

of stock in the county. I say there's got

to be something done about it and that

a few seconds he was so agitated.

Farmer Peck stormed up and down for

exterminate the brute. So far as I am Fangs.

right away."

devilish wolf, Yellow Fangs, has been at , broke in. "Drat his hide, I'd go five dol-

"I agree that there ought to be an end | slaying a sheep and its fangs were re-

put to the depredations of this beast. We | ported to be two inches long and yellow.

might get in some experienced hunters and | That is the way it got the name of Yellow

lars on a reward pot for his capture."

Roger Wharton, eighteen, the dreamer

of the village of Hopedale, sat on a keg

of nails back in a corner and listened to

this tale of woe. He had heard about the

wolf before. For three years it had been

roaming up and down over two or three

townships and living off the fat of the

herds. Attempts had been made to run

it down with dogs. It rended the dogs.

Some one saw it one day in the act of

tention diverted from the conversation. "I bet that is what killed my geese," she

with his nail weighing.

Mrs. Smith had her at-

of a sharp-toned bell, the blowing of a whistle or horn, near a common house dog, would make him sit up on his haunches and howl. When he howled he thrust his nose into the air and closed his

> "So much for common dogs," he reasoned in half whispers. "Ditto Yellow Fangs. What will hurt a dog's ears will hurt Yellow Fangs'. He is just a wild dog; that's

eyes until the noise ceased. He accounted

for this on the theory that a dog's ear

drums are very sensitive and shrill noises

Farmer Peck, after wishing all the evil things in the world to happen to Yellow Fangs, went to talk the matter over with County Agent Whitely of the local Farm Bureau. He was determined to bring about some organized effort to get rid of

Yellow Fangs was a stray. There had not been a wolf in Dodge County for year It was generally believed that he had escaped from a traveling managerie or had drifted in from the mountain county from the north and found things so well to his liking that he had decided to take up his residence in Dodge County as long as things came his way.

Farmer Peck strode off cracking his heels on the ground like he was in deep earnest. Young Wharton followed along after him, whittling a pine sliver he had picked up. He slipped into the Farm Bureau office without attracting especial attention. Agent Whitely nodded to the boy when he entered and took a seat in the rear of the room.

Dogs were afraid of it; that is, the ones Farmer Peck stated his grievance in few which were not killed or so badly mangled and emphatic words. He wanted that wolf that all the fight had been taken out of killed and no more foolishness about it. them. Hunting parties were organized As a member of the organization he was and armed and searched the woods for willing to stand his share of \$100 reward miles around. Yellow Fangs had a nose for the capture of the night prowler. too acute to be caught in that way. He

Agent Whitely fell in with the idea and it was agreed that the reward should be published in the county paper that week. When the two were about to separate, after further discussion of the matter, to which Wharton listened carefully, Farmer Peck got to his feet and was in the act of shaking hands, when the dreamer boy

(Continued on page seven)

Additional Radio News Will Be Found in Section Two of To-day's Herald Tribune

domestic.

Yellow Fangs wanted to know what was

did not come out from his hiding place

when there was snow on the ground. He

This boy dreamer, Roger Wharton, was

also wise in woodcraft and in the ways of

woodfolk generally. He had a pretty good

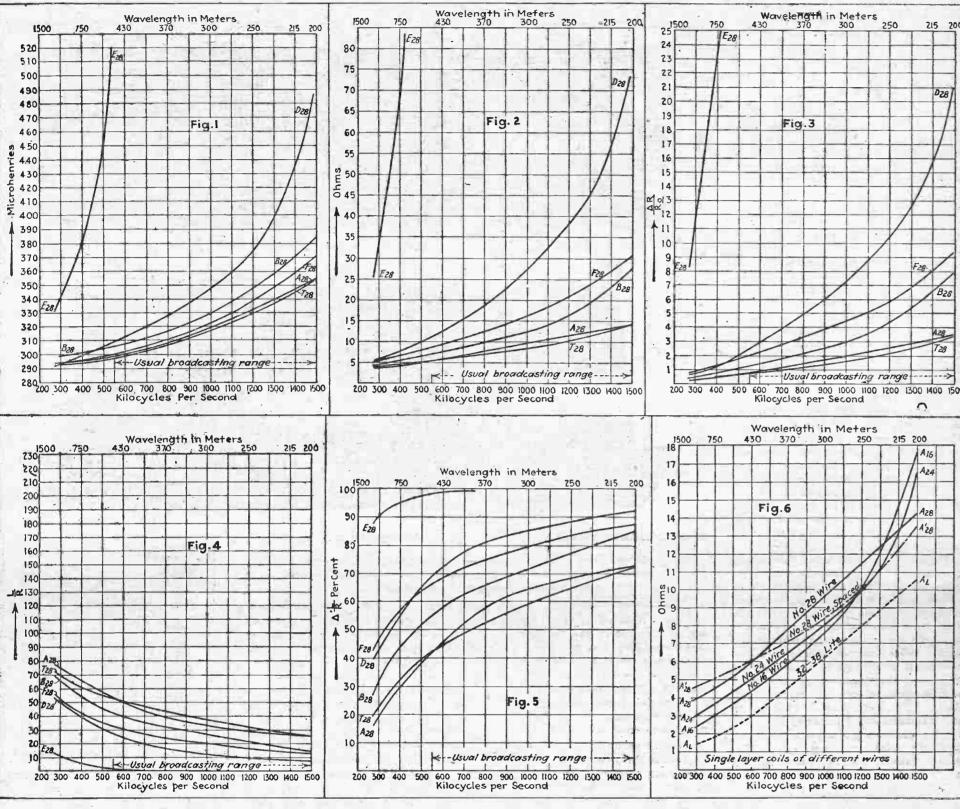
knowledge of the animal family, wild and

He knew, for instance, that the ringing

### Radio-Frequency Resistance and Inductance Of Coils for Broadcast Receivers

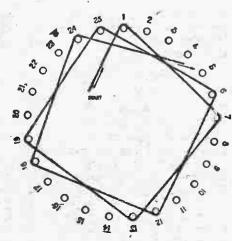
Tests Conducted by the U.S. Bureau of Standards Give Interesting Data on Inductances

By FULTON H, CRAWFORD

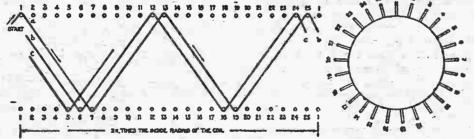


Five graphs prepared by the United States Bureau of Standards to show the electrical characteristics of different types of inductances used for broadcast reception, and one graph showing how the radio frequency resistance of single layer coils varies with the size of wire. Figure 1—The apparent inductance at different frequencies. Figure 2-Radio frequency resistance at different frequencies. Figure 3-Ratio of increase of resistance over its direct current value to its direct current value. Figure 4-Ratio of inductance to resistance. Figure 5-Percentage decrease in the ratio of inductance to resistance below the value of 1 kc. Figure 6-Radio frequency resistance of single layer coils with different sizes of wire. In figures 1 to 5, inclusive, A-28 is a single layer coil, B-28 is a radial basket-weave coil, D-28 is a honeycomb coil, E-28 is a two-layer coil, F-28 is a narrow basket-weave coil, T-28 is a loose basket-weave coil. All coils are wound with No. 28 wire and have a minimum inductance value of 291 microhenries.

JRING the last two years much has been written about the relative merits of various designs of socalled low loss coils and about the disadvantages of the standard single layer solenoid. Every writer and manufacturer has designed at least one type of radio inductance for which he claims the lowest radio frequency resistance, distributed capacity, etc. However, due to the fact that the same claims have been made for each coil the radio public has been at a loss for information on which type is really the most satisfactory.



form for narrow basket



Winding forms for spiderweb and honeycomb coils

layer narrow basket weave, loose basket

weave, two-layer bank wound, three-layer

bank wound and four-layer bank wound.

As it is known that bank-wound coils are

entirely unsatisfactory they will not be

fully discussed in this article. The two-

layer coil, however, will be considered, as

it is a typical example of poor coil con-

strate the importance of using good coils.

coils of each type were constructed, some

with different insulating varnishes or

were adjusted to the same self-inductance

For the purpose of the tests several

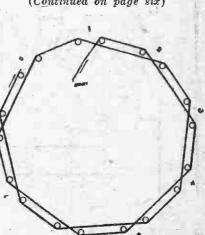
Some of the much desired information | radial basket weave on cardboard, radial on coils is now available to the public for basket weave on rubber, honeycomb, twothe first time. In Technologic Paper No. 298 of the United States Bureau of Standards (part of Volume No. 19), entitled "Radio-Frequency Resistance and Inductance of Coils Used in Broadcast Reception," by August Hund, electrical engineer, and H. B. De Groot, junior aid, the United States Department of Commerce releases many interesting data on various struction, and it will be used to demontypes of coils used for the reception of radio broadcasting. Tests conducted in the radio laboratory of the Bureau of Standards formed the basis of the paper, with different sizes of wire and others and as the data which it contains are of great value to the radio experimenter, a | binders. In each case, however, the coils summary of the results of the tests is given here.

at a frequency of kc per second, namely, Ten types of coils, six of which will be | 291 microhenries, which is of the order found illustrated on page six, were com- of magnitude common in receiving equippared in the tests. They were single-layer | ment for tuning to broadcast wave lengths.

quality of a coil can be considered in terms of a number of different properties, each of which is of importance in the use of the coil. For use in the tuned circuit of a radio receiver the important characteristics of a coil are:

- (1) The apparent inductance.
- (2) The radio-frequency resistance. (3) The ratio of the increase of resistance over its direct current value to the direct current value.
- (4) The inductance resistance ratio.

(Continued on page six)



#### Service and Parts News and Notes of the Radio Trade

To Build New Factory

Jerome Avenue, New York City.

In the new Fada plant there will

ette, the Neutrola, the Neutroceiver

All the Fada sets are tuned radio

Sales Report

known GR line of radio parts.

Battery Eliminator Exhibit

with the many various types of re-

These manufacturers have secured

the two stores of Haynes-Griffin, Inc.,

for the exhibition, starting Saturday,

January 23, and continuing from 8:30

ceivers on the market to-day.

Recognizing the widespread public

Dr. Gordon C. Sleeper, president

new loudspeaker.

rodyne principle.

Hammarlund Koberts FIVE-TUBE RECEIVER

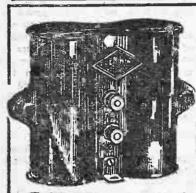
As Advertised

We are prepared to supply complete parts—tested and guaranteed. We are ready to check your wir-ing, locate your troubles and make your receiver operate efficiently. Completed receivers on demonstrathe manufacturing activities that are

vidual types or forms of cabinet.

Authorized Hammarlund-Roberts Service Laboratory PHONE RECTOR 2538

An organization of competent engineers with the personnel and equipment to render quick and inexpensive radio service of any character or scope ROSSITER, TYLER & McDONELL, Inc.



guaranteed.

Kit of 3 Matched Lemnis-Coils \$12 with wiring diagram At All Dealers or Direct From Factor; Write for Descriptive Circular GENERAL WINDING CO., Inc 214 Fulton St. New York



EROSLEY TRIRDYN SPECIAL



acorporating the famous \$00.95 brings in stations, sharp, clear and mellow. In scaled cartons; List Price \$60 The New PARAGON Three



**EUROPE** Broadcasting! Special Programs All This Week MOUNTFORD DISTANCE

GETTER WILL HELP YOU TO Hear Them CLIPPED TO YOUR SET IN A SECOND

Only 50c AT ALL DEALERS stpaid Upon Receipt of Price C. E. MOUNTFORD

, its kind ever held in New York City. The Davidson Radio Corporation, Every well known type of battery manufacturers of the Rasla Products, eliminator and battery substitute will

has moved to 134 Livingston Street, be on demonstration and in actual sets during the entire period of the exhibition. Each manufacturer will F. A. D. Andrea, Inc., manufactur- have a separate booth where his ers of the Fada receivers, have pur- product will be displayed to the pub-

chased more than an acre of ground lic. in one of the best business sections | Manufacturers' representatives and of the Bronx, New York City, for a engineers, as well as the Haynesnew plant which is to be devoted ex- Griffin technical staff, will be availclusively to the manufacture of radio able to answer questions and give inapparatus. The new plant will be dividual problems careful attention ocated at 138th Street and will ex- Complete information with data on tend from Mott Avenue to Walton the operating cost of various elimina-Avenue. Here will be concentrated tors will be available.

The program for the exhibition in now being conducted in four fac- cludes a series of talks and demon-Special assemblies made to fit indi- tories located at and near the main strations by men who have figured division of the company at 1581 prominently in the development of battery eliminators and socket de-The company reports the cost of vices. Among those who will speak the property to be about \$250,000 during the week are Harry W. Houck and expects an outlay of \$750,000 by development engineer of the Dubilies the time the buildings are erected. Condenser and Radio Corporation; RADIO R 5 FRVICE The \$150,000 laboratory of the firm, Grant A Layng, of the Mayolian Corwiden which contains some of the finest which contains some of the finest poration; Major R. A. Clark, of the and most delicate instruments for Gould Storage Battery Company, and testing purposes known to science, A. J. Haynes, vice-president and en-

will be moved from its present site gineer of the Haynes-Griffin Company. One section of the exhibition wil be ample space for the volume production of such sets as the Neutro- down eliminators. Step by step construction and wiring of a practical B and the various art furniture models battery eliminator will be visualized manufactured by Andrea. By the in an exhibit showing the various time the plant is in operation the stages of construction. The exhibicompany will be in production on its tion is open to the general public without charge.

#### frequency receivers using the neu- Alphabet Code Prevents Misunderstood Calls

(Continued from page six)

of the Sleeper Radio Corporation, of stations get around this situation in Long Island City, has announced a way by announcing the name of the record breaking December shipments city in which the station is located: that the corporation ended 1925 with amounting to \$174,068. The total "Radio Paris," "Radio Madrid," and shipments for the last quarter again, "Radio Geneve." But this amounted to \$457,247. This business would be a difficult thing to arrange compares with \$51,769 for December, in cities like Chicago and New York, 1924, and \$202,560 for the last quar- where there are a dozen stations or

special efforts to make distinct their call letters.

Of course, it is possible to identify \$6.75. cal battery eliminators during the past year, nearly a dozen prominent manufacturers are co-operating in a stations through their special broadspecial exhibition and demonstration initials. But how about making it designed to show radio owners the most satisfactory and successful types of battery elimination for use types of battery elimination for use with the many various types of re-

#### WANTED Radio Program Director

January 23, and continuing from 8:30 to 6 daily for the period of one week.

No effort has been spared to make the exhibition the most complete of the exhibition the exhibition the most complete of the exhibition the exhibition the most complete of the exhibition that exhibition the exhibition the exhibition that exhibition the exhibition that

ADDITIONAL RADIO NEWS AND **ADVERTISEMENTS** 

will be found in the

SECOND NEWS SECTION TO-DAY

Hammarlund

Tune In On \$7.90 The World This Week

The international broadcast tests this week will mean something to the fan who owns a Hammarlund-Roberts Receiver. Here is a circuit that stands in the very forefront with the

It makes five tubes do the work of eight (without reflexing), and

you can build your Hammar-lund-Roberts Receiver in a few hours and be all ready to tune in on the world. Your dealer sells the Foundation Unit, containing drilled and engraved panels, brackets, etc.and all other parts specified in the instruction book. The receiver complete will cost you only \$60.80, without cabinet.

IT'S BEEN DONE
THE NEW PATENT PENDING
"SUR-LOC" CONNECTOR.
The missing link of the Alkaline type
storage "B" Batteries. Admitted the
greatest improvement to date. 15% to

Hammarlund Manufacturing Co. 424-438 West 33rd St.,



### Radio Exchange

Rate, 40 cents a line. Ads. accepted until 12 o'clock noon Friday.

PHONE PENNSYLVANIA 4000

compares with \$51,769 for December, 1924, and \$202,560 for the last quarter of that year—an increase of more than 100 per cent.

In it were possible for our Ameritan 100 per cent.

If it were possible for our Ameritan 100 per cent.

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If it were possible for our Ameritan 100 per cent.

If it were possible for our Ameritan 100 per Parts and Equipment DON'T BE MISLED

RECHARGEABLE B BATTERY 100-VOLT KNOCKED-DOWN UNIT.
\$6.75, INCLUDING OAK CABINET.
EDISON ELEMENTS WITH NEW TYPE
CONNECTOR.
SEND FOR OUR LITERATURE.
ROMCO STORAGE BATTERY CO., 146
65 WEST 18TH ST., DEPT. H.

WE WILL WIRE OR REWIRE ANY 5,
4 or 5 tube set for \$5.
AUTHORIZED AMBASSADOR SERVICE
For real selectivity build the famous
4-tube Ambassador, using all genuine
Ambassador parts.
Our complete kit, 4-tube set, \$17.00.
RADIO SERVICE SHOP
762 MELROSE AVE,
OPEN EVENINGS MELROSE 4662

Mail orders filled.
ROBERTS BATTERY CO.,
1122 Myrtle Ave., Brooklyn, N. Y.

BUILD rechargable B battery, 100-volt unit, \$5; assembled, \$10. ROYAL STOR-AGE BATTERY CO., 124 West 34th. B battery wire, No. 20, for building storage B batteries. Bolser & Co., 101 ELECTRODYNE CO., 2378 3d Ave., specializing Mica: By-Pass Condensers. Harlem 2048.

pled amplification, clearest reception possitle, \$40, money back, guaranteed, JEFFERSON RADIO CO., 676 Saratoga av., Brooklyn, Louisiana 3358.

CROSLEY Radios, \$9.75 up; Stromberg Carlson, time payments. Radio Rite Service. 18 13th av., Newark. Market 8574.

Model, will sell complete, reasonable. Call evenings, 128 St. Edwards St.,

\$16.95. Five-tube tuned radio frequency. Bakelite panels, dials, low loss coils and codensers. Mall orders filled. Edzin Radio, 675 Sixth Ave. Caledonia 2618.

ONE, three, four, five tube sets: \$2.95 \$14.95; \$17.95; \$16.95; \$27.50. EDZIN RADIO, 675 Sixth av. Caledonia 2618.

Super-Heterodyne Specialists
711 8th Ave. Pennsylvania 7779 Cabinets

WHY NOT let Radio Doctor remedy all allments of your radio set? Address TRAVIS, 52 Macon St., Brooklyn. RADIO CABINETS and emasoles made building, repairing G. E. to order, also in stock; prices reason Johnson Ce., 151 Gates av., Brooklyn to order, also in stock; prices reasonable. J. Iglesias, 911 6th av.

WE WILL WIRE OR REWIRE ANY S,

ERLA SERVICE STATION

Authorized by Electrical Research Lab.
A limited number of factory built
Erla Sets at special prices.
REPAIRING, REMODELING, REWIRING
all circuits. Also carry Erla parts.
APEX RADIO SERVICE
123 Liberty St. Rector 3176

ROY'S: PHONES, LOUD SPEAKERS repaired, remagnetized; sets repaired. Super-Heterodynes especially; weak tubes that light rewired. 50c. Roy's, 100 W. 46th St. Bryant 0985.

AUTHORIZED AMBASSADOR SERVICE

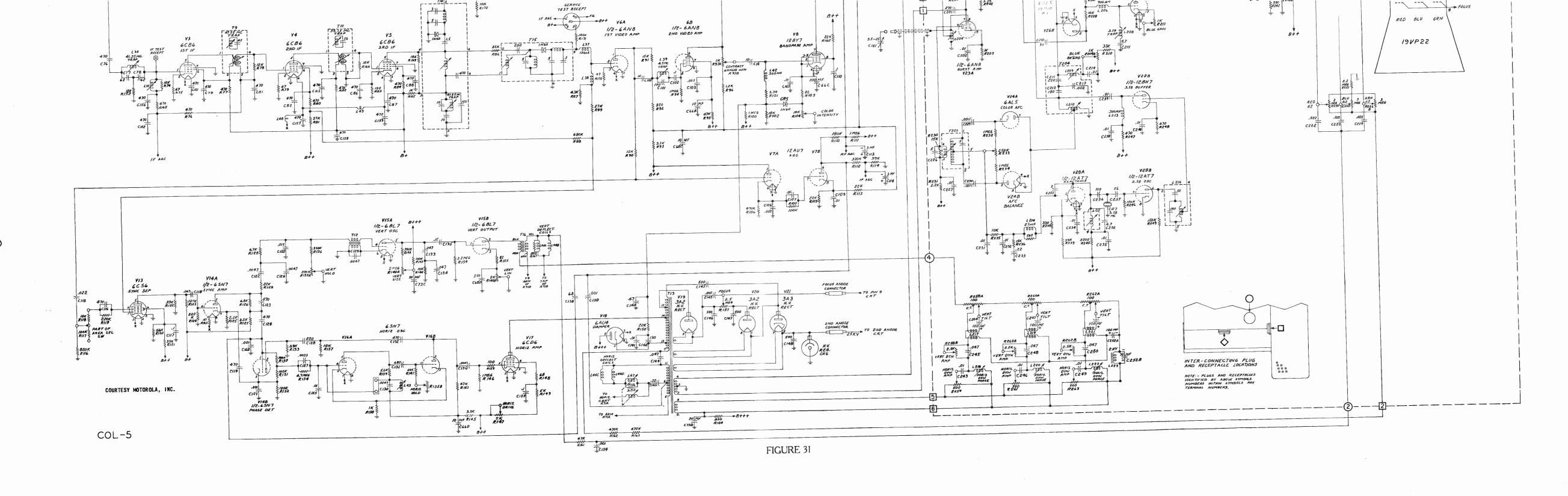
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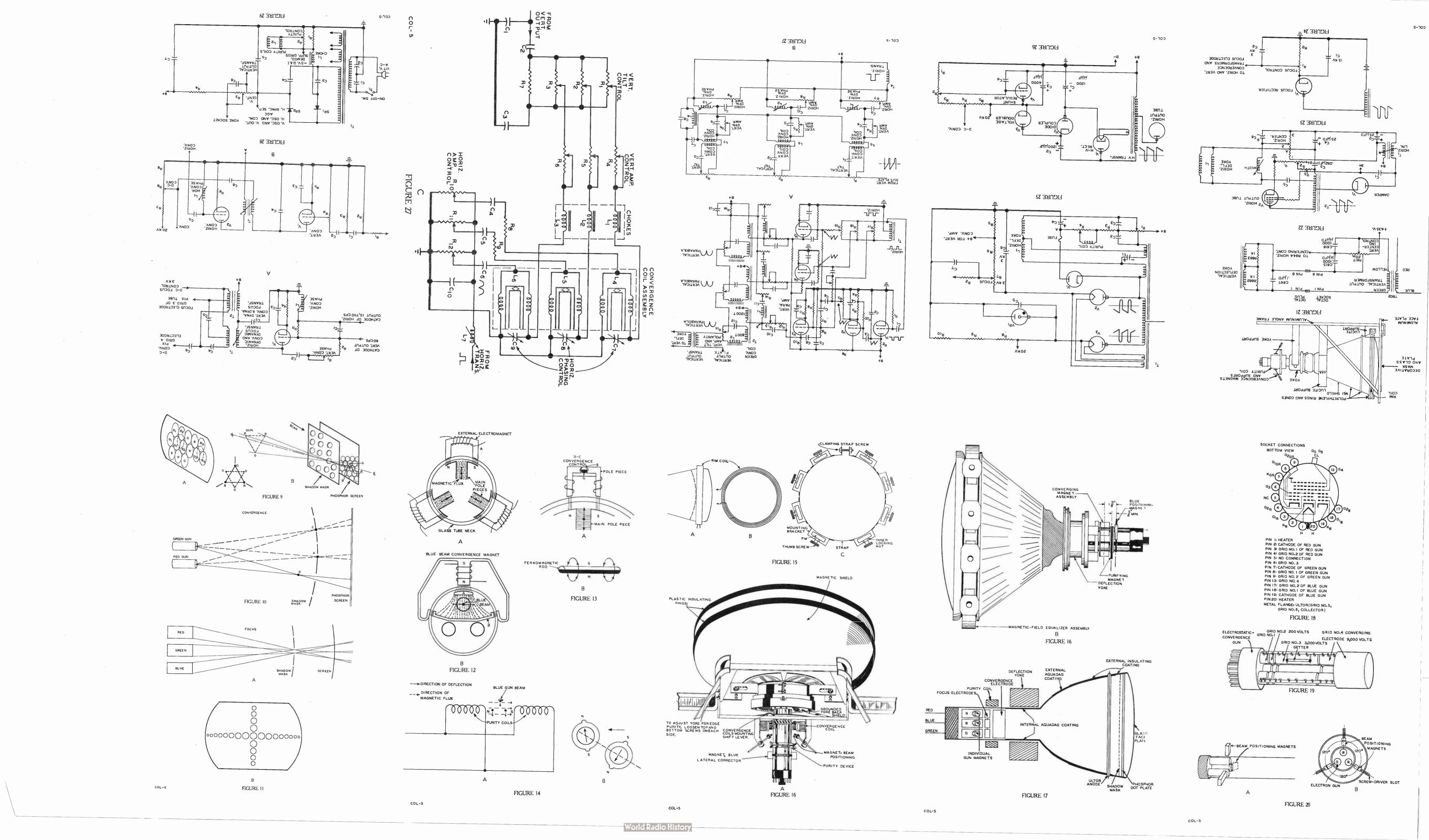
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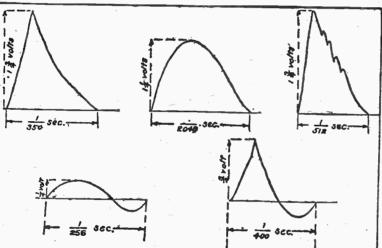
### The Present Status of Radio Atmospheric Disturbances in Europe by the counting method is the same thing that is being meas-

Thunder Storms Have Been Known to Cause Inter-strength, or by measuring the strength of signal which can be read ference in Receivers Located 1.500 Miles Away; Most Static Is Directive

The following is a paper presented by L. W. Austin, of the United States Bureau of Standards, before the annual convention of the Institute of Radio Engineers in New York City January 19, 1926.

longer wave lengths. (2) Except for would be understandable if the the more southerly origin. the effects of local storms, they are lightning discharge curves were of Unfortunately, very few triangulanearly always stronger in the afteris confined usually to the night. Possible that the small deflections that is known. (3) They are stronger in summer from the lightning flashes were due Observations made at Madison. than in winter, (4) in the South than to a paralysis of the detector tube, Wis., by Professor Terry, of the Uniin the North, and (5) on the land a phenomenon which often occurs versity of Wisconsin, covering the portion of them appear to be direct- high electro-motive forces. It must, ive; that is, to come from definite therefore, be concluded that the conturbances travel along the earth with listen to the atmospheric crashes a practically vertical wave front, like from thunder storms in the neighthe signals; (8) that a considerable borhood. wave lengths; and (9) that disturb- of thunder clouds to the upper con- Wis., is about the same as from Yuances sometimes occur simultane- ducting region of the atmosphere. catan to Washington.

ously at stations thousands of miles His calculations indicated that thunling disturbances (grinders) has a conducting layer at a height of been the subject of many conjec- sixty to eighty kilometers, since the tures. Eccles believed at one time electric force required to produce that he had found the source of this discharge decreases even more rap-



type of disturbance, as far as Eng- idly with the height than the eleccosmic dust. The idea that this type Mr. Watson Watt, in analyzing the their work the atmospheric disturbup to about 1,500 miles.

There is still much difference of ranges.

land was concerned, in distant thun- tric force of the thunder cloud. Dis- tion of their wave form is of much der storms, especially in Western charges of this kind, probably nonder storms, especially in Western charges of this kind, probably non-luminous, may possibly furnish the the grinders are due to the bombardment of the upper atmosphere by electrons from the sun or charged lectrons from the sun or c

of disturbance comes in some way records of European direction-finding ance, after being received on an from above has also been held by stations, concluded that in only about aperiodic antenna and amplified by Weagant. Mosler, while ascribing the disturbances to thunder storms, concluded, in contradiction to the ideas of Eccles, that thunder storms could be about 75 per cent of the source of 60-cycle current was constituted that in only about appendix appendix appendix appendix appendix and amplified by an aperiodic antenna and amplified by an aperiodic antenna and amplified by an aperiodic resistance-coupled amplified by an aperiodic antenna and amplified by an aperiodic resistance-coupled amplified by an aperiodic antenna and amplified by an aperiodic antenna and amplified by an aperiodic resistance-coupled amplified by an aperiodic antenna and amplified by an aperiodic antenna and amplified by an aperiodic resistance-coupled amplified by an aperiodic resistance-coupled amplified by an aperiodic resistance-coupled amplified by an aperiodic antenna and amplified by an aperiodic resistance-coupled amplified by an aperiodic antenna and amplified by an aperiodic antenna and amplified by an aperiodic resistance-coupled amplified by approximate and amplified by an aperiodic resistance-coupled amplified by an aperiodic resistance-coupled amplified by an aperiodic resistance-coupled amplified by approximate and amplified by an aperiodic resistance-coupled amplified by approximate and amplified by approximate and amplified by approximat of Eccles, that thunder storms could cases the identified sources were rain nected to the other pair of plates

limitation in distance was very prob- | Captain Bureau, of the French Melimitation in distance was very probably due to insensitive apparatus. A teorological Office, has recently publication in distance was very probably due to insensitive apparatus. A very systematic study of thunder lished papers in which he shows that movement of the spot of light could storms and atmospherics, undertaken by the British Meteorological Office and the Admiralty, has apparently with the advance of meteorological observed and sketched with some accordance to the state of storms and atmospherics, undertaken many of the atmospheric disturband the Admiraity, has apparently with the settled the fact that thunder storms cold fronts and that the atmospherics shown in the figures. Most of these ments come in contact with mounted appear to be aperiodic, though some are feebly oscillatory.

opinion as to the proportion of at- For the determination of the direcmospherics which is due to thunder tion from which atmospheric disturbmospherics which is due to thunder them item which achieve the main curve. It will be noted that storms. Professor Appleton, at a since come, Mr. Watt has invented an the period of the main oscillation is, storms. Professor Appleton, at a antes come, at the period of the main oscillation is, symposium on atmospheric ionization automatic recording apparatus in in all cases, of audio frequency; and and radio-telegraphy, November 28, which a radio compass coil, tuned to Ecklersley has pointed out recently and radio-telegraphy, November 20, about 30,000 meters, is rotated slowly that the relatively prolonged imtically all atmospheric disturbances and continuously by clockwork, the might be produced by thunder storms atmospheric crashes being recorded account for the observed intensity of

It is undoubtedly true that thun- It should be said in this connection der storms produce many atmospher- that it has been very common in Eu- enced in radio reception. He suggests ics, but it is not by any means cer- rope to estimate the strength of at- that possibly the ripples, such as are tain that lightning flashes themselves mospherics by the number of dis- shown in Figure 3, may be the actual are always the actual sources. There turbances occurring in a given time. atmospheric waves. Mr. Watt in the is a widely prevailing idea among This method, of course, would hardly symposium cited accepts this view radio operators that the lightning seem to be applicable to our Wash- and adds that more recent experiflash often produces only a harmless ington summer conditions, or to the ments in Egypt and elsewhere in the click in the telephone receivers. I conditions during the disturbance tropics show that there the fine ripple have made some observations during season in the tropics, where often in structure is much more common and thunder storms, using a coupled cir- the afternoons and evenings the noise of much greater amplitude than in cuit with rectifying vacuum tube in the telephones form an almost England. Professor Appleton, on the and galvanometer, which indicated continuous rumbling through which other hand, holds that the low-frethat lightning flashes, even within no signal can be heard unless it is quency wave forms shown in the three or four miles, were not as pow- strong enough to rise above the back- figures are capable of producing the Recter 3268 erful in their effects on the receiving ground of disturbing sounds.

Recter 3268 observed disturbances at a physical difference in a physical difference between the control of the disturbances at a physical difference in the control of the disturbances at a physical difference in the control of the disturbances at a physical difference in the control of the disturbances at a physical difference in the control of the disturbances at a physical difference in the control of the disturbances at a physical difference in the control of the disturbance in the control of t

ference between the atmospherics, crashes, grinders, etc., it is not at all certain that what is being measured ured in America, either by direct esthrough the disturbances. On the Atlantic and Pacific coasts

of the United States, except for occasional local thunderstorms, very little certain connection has been noticed between the direction of the atmospheric disturbances and rain areas. On the Atlantic coast the main dis-Our knowledge concerning the at- | turbances which occurred when no | the southwest, but it seems uncertain turbances seem to come roughly from mospheric disturbances is still very flashes were apparent. This compar- whether the sources are in the Allemeager. The observed facts may be atively feeble effect of the flashes is gheny Mountains or much farther recataloged as follows: (1) In general, rise at the beginning of the flash is ments reported by the Navy Departdifficult to understand if the current moved, perhaps in Yucatan. Experiatmospherics are stronger at the as steep as is often assumed, but ment in New Orleans have indicated

the form and duration of the atmospheric disturbance curves observed America for fixing the exact positions noon and night, while for the higher by Appleton and Watt (Figures 1 to of sources of atmospherics. In most frequencies this increase in strength 5). On the other hand, it is quite cases, therefore, the direction is all

than on the ocean. (6) A large pro- when the tube is exposed to very last two years, show conditions in the Middle West which are similar to regions, or centers, as mountain nection between lightning and atranges, rain areas, or thunder storms. mospherics is still not clear, and val-It is also reasonably certain that (7) uable work can be done by any one no single prevailing direction of the at least most of the long-wave dis- who will watch the lightning and atmospherics, but a more or less defiand other rain areas. This absence of any prevailing southerly source of portion are oscillatory in character, At the London Physical Society of the country casts doubt on the atmospherics in the central portion though a certain portion are non-symposium already mentioned, Pro- Mexican origin of those observed in oscillatory and give rise to shock fessor C. T. R. Wilson discussed the the Atlantic Coast region, since the oscillations in the antenna at all probability of there being discharges distance from Yucatan to Madison,

der clouds of common electric mo-States it is pretty well established On the Pacific Coast of the United The origin of the ordinary rumb- ment might very readily discharge to that at least at San Francisco and are largely local, lying in the moun-These centers seems to be permanently fixed, resulting in very constant

It seems to be pretty well settled, in all parts of the world where observations have been made, that there is a very definite connection between the intensity of the disturbances and the position of the sun. In the Northern Hemisphere during the winter. when the sun is far in the south, the disturbances are generally moderate even as far south as Panama, within 9 degrees of the equator. But as the sun comes north in the spring there is often a rapid and, sometimes, very sudden increase in strength, and it is reported that stations close to the equator experience two disturbance maxima, corresponding to the two periods when the sun is nearly

In addition to the study of the sources of the disturbances, the quesimportance. Messrs. Watt and Apray oscillograph (Braun tube). In for the purpose of drawing out the

In Figure 3 it is seen that there pulses of Watt and Appleton cannot the atmospherics ordinarily experi-

### Constructional Data on a Simple, Efficient Two-Control Six-Tube Receiver

Although a Siamese Variable Condenser Is Used the Set Is Not Difficult to Build

By ROBERT HERTZBERG

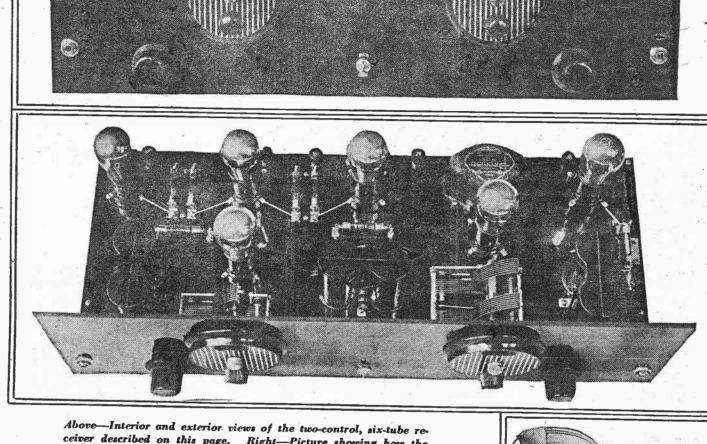
HERE is something about a twodial radio receiver, any two-dial receiver, that endears it immediately and everlastingly to every man, woman or child who acquires one. The appeal is a definitely physical one, and has no superficial psychological aspects. The simple fact is that all human beings, circus sideshow characters excepted, are equipped with two hands; therefore, it follows quite naturally that any machine which requires manual manipulation will afford the greatest satisfaction to its operator, with the expenditure of the least physical and mental eort on the latter's part, if it has a maximum of two continuously variable controls. The logic is irrefutable.

Well, then, why not make two-dial sets instead of three-dial outfits, which keep their owners' hands in a constant state of movement between the knobs? We have some very nice double and triple variable condensers all ready for us, so all we have to do is to select a circuit and some tuning coils, choose an audio amplifier system and decide on the mechanical arrangement of the composite unit. It sounds easy and it is easy; just to prove it the writer will describe a highly effective two-dial receiver which he designed on a tablecloth at a luncheon table at noon, which was built during the afternoon, and which was supplying sweet music that same evening. The set is proving to be so gratifyingly satisfactory in every respect to the untechnical members of his family that he thinks even the most sophisticated constructor will find its description interesting.

The set is a six-tube affair, comprising two stages of tuned radio frequency amplification, detector, one stage of transformer coupled and two stages of resistance coupled audio amplification, with one of the new power tubes in the last socket to handle the strong output without distortion. This combination is by no means new, but it is indisputably a good one, for it displays the blessed characteristics of sensitiveness, selectivity, volume and clarity. The front panel is of standard and reasonable size, 7 inches by 24 inches, and the whole outfit presents a simple but strikingly attractive appearance. The striped bakelite dials in particular aid in the effect.

#### Parts Required

The exact parts used were as follows: 7 by 24 inch bakelite front panel, 9 by 23 inch back panel; three Gen-Win "Lemniscoils" (radio frequency transformers); two Bruno micrometer dials; Cutler-Hammer toggle-type battery switch; Precise 21/2 to 1 audio transformer; Dubilier grid condenser and leak; two No. 112 (1/2 amcouplers, and the following Amsco instruments: one single .00035 mfd. straight line frequency and one Siamese condenser consisting of two .00035 mfd. straight line frequency sections; one 10 and one 15 ohm rheostats; one single



ceiver described on this page. Right-Picture showing how the radio-frequency transformers are constructed.

Editor's Note.—The various pieces of apparatus referred to in this article were actually selected by the author and employed in the construction of the receiver described. This does not imply their superiority over equally efficient standard apparatus of other manufacture, which may be substituted with discretion.

jacks; six UX-type tube receptacles; ten | L-shaped bracket is screwed to the front binding posts. Other makes of corresponding electrical and mechanical features may be employed.

As clearly shown in the accompanying photographs the panel holds the variable condensers, rheostats, battery switch and phone jacks. The condensers are mounted seven inches in from the sides of the panel and three inches down from the top. The rheostats are spaced in four inches from the sides and one and oneeighth inches up from the bottom, with the 10 ohm on the left. The switch fits evenly between the condensers and just above the bottom edge of the panel.

The three-spring jack is fastened in pere) amperites; two Daven resisto- the right-hand corner of the panel, the other behind the do other in the left corner, about an inch in. | the second R. F. bulb; a third in the They are raised 1% inches above the upper right-hand section of the subpanel bottom edge, with their frames facing | for the detector; the fourth, fifth and upward, so that the 9 by 23 inch sub- | sixth along the back edge in the left-hand panel rests comfortably on them and section. clears the edges of the two rheostats. The audio transformer occupies the closed circuit (three spring) and one The jack frames are heavy and act as space behind the second R. F. socket and

panel and subpanel, just above the battery switch, to support the center section of the subpanel. Short machine screws passed through the latter into the jacks hold the bakelite in place.

The lay-out of the parts on the subpanel is practically self-explanatory, the photograph being very clear. One Lemnis coil is fastened next to the single condenser by means of the brackets supplied with it; a second fits between the single and the double condensers, being turned as shown; while the third fits on the righthand side of the double condenser. One socket for the firsts R. F. tube is placed directly behind the single condenser; an-

couplers fall naturally between the last three sockets. The grid condenser goes in its natural position between the third Lemnis coil and the detector receptacle. One amperite is screwed down between the center Lemnis coil and the socket to the left of the audio transformer, while the other fits in front of the left-hand resistocoupler. The ten binding posts are disributed along the extreme back edge of the subpanel in this order from left to right: aerial and ground; C battery; 135, 90, 22½, minus B battery; A battery.

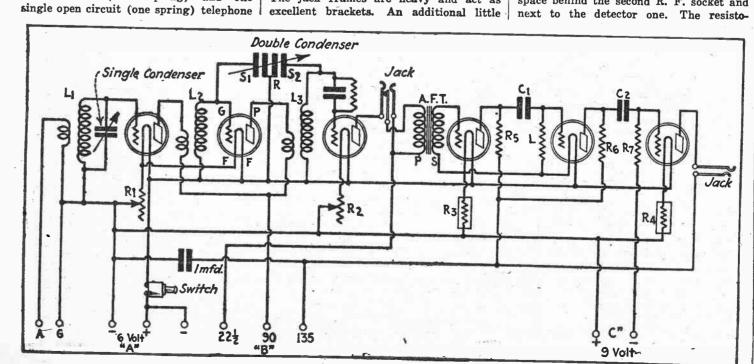
The Bruno micrometer dials, just brought out, require no mounting screws, but fit simply over the protruding ends of the variable condensers. On the under side of each disk there is a little bakelite projection, which fits into a hole drilled in the panel about two inches directly above the condenser shaft openings. This holds the device firmly in place and prevents it from twisting around when the control knob is turned. The dials use a friction system of reduction drive and provide what the writer considers exceedingly smooth regulation of the variable condensers.

#### Drilling the Panel

These directions are given in detail for the benefit of the inexperienced corstructor. If he follows them he will not have the slightest difficulty in completing the set correctly at the first attempt.

The front panel and the subpanel sub-panel and run to their various destinations on the under side of the latter. This removal of the wires from the top surface in no way affects the electrical operation of the set, but it most decidedly does in prove its appearance. In fact, all the writer's friends who saw the set comment.

(Continued on page seven)

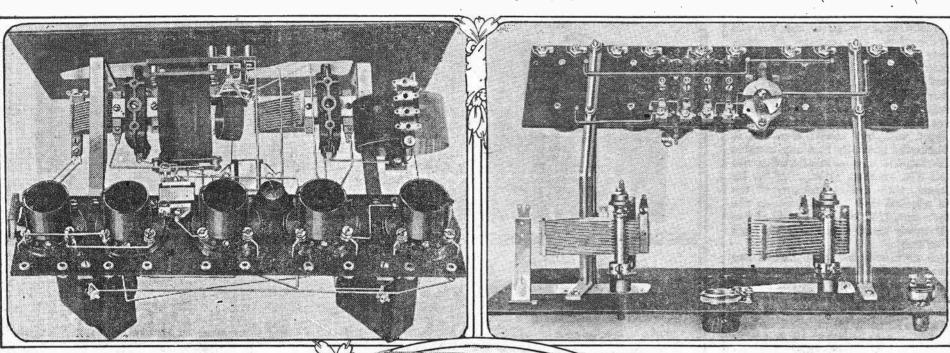


The wiring diagram of the receiver herein described

### How to Build the Improved Five-Tube Non-Radiating Roberts Receiver

This Set Employs One Stage of R. F., a Regenerative Detector and Two Radio Stages

By VEECH T. BAIRD The Hammarlund Manufacturing Company, Inc.



THEN the Roberts circuit made its first appearance about a year ago it proved an instant hit with the fan who builds his own and with the professional set builder. They found that it was selective, sensitive, easy to tune, a good distance-getter and that it gave great volume without distortion. The original Roberts was a three or four tube reflex, designed primarily for economy of tubes and current. The original set, however, had its drawbacks, due to the reflex stage, which, in some cases, caused howling, was difficult to stabilize and affected the quality of reproduction.

The designer of the circuit, assisted by a number of other engineers, has spent many months in redesigning this circuit so that the reflex feature could be eliminated and the set simplified and reduced to one stage of tuned non-oscillating radio frequency, a detector and two stages of audio, which would give faithful reproduction. The obstacles were finally overcome, and the five-tube Roberts hook-up is one of the simplest, most positive and efficient circuits offered to the set builder

The writer has just completed building a number of these sets for use under very exacting conditions and believes information on the subject will be a valuable contribution to other set builders.

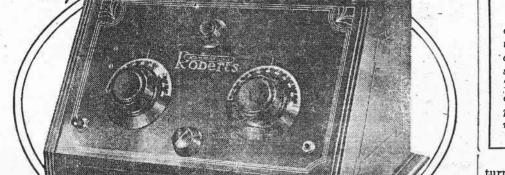
#### The Circuit

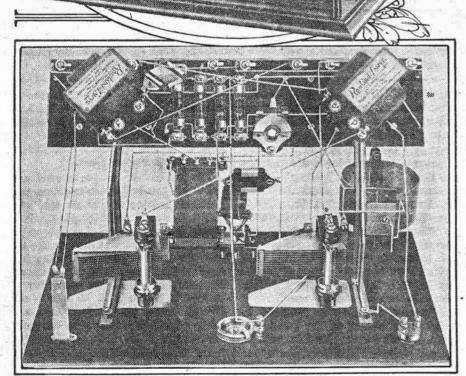
The circuit employs a stage of tuned and non-oscillating or neutralized radio frequency so arranged as to give exceptionally high amplification to weak signals. a regenerative detector, a stage of straight audio amplification and a stage of audio amplification, having two tubes arranged in a parallel on a single audio transformer. This last audio stage permits the set to give exceptional volume without distortion. On local or very strong signals one of the tubes in this last stage may be removed from the socket without sacrifice of volume.

The following parts were used in the sets constructed, but others may be substituted if desired:

Two Rauland lyric transformers, two Hammarlund .0005 mfd. model C or S. L. F. condensers, one Hammarlund "midget" condenser, one set Hammarlund-Roberts coils, two Na-ald "Super De Luxe" four-inch bakelite dials, 5 Na-ald De Luxe" sockets, one No-ald K3,843-1% 1 inch dial, one Carter 25-ohm "Imp" rheostat, one Carter single circuit No. 101 "Holt-Tite" jack, one Carter "Imp" battery switch, one Durham resistor, four amperites No. 1-A, one Dubilier type 640-G .00025 mfd. grid condenser, one Dubilier type 640 .002 mfd. fixed condenser, one Dubilier type 640 .006 mfd, fixed condenser, five pairs Union phone tip jacks, one Hammarlund-Roberts foundation unit (contains engraved bakelite panel, drilled bakelite and subpanel, metal brackets and

It was found impossible to purchase drilled and engraved panels, panel supports, etc., for this set, and by the use of these ready-made parts a great deal of



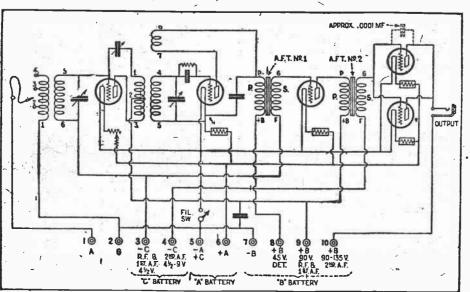


A front view of the completed receiver and three other views showing the set in several stages of construction

finished set was produced.

A glance at the diagram shows the extreme simplicity of the circuit, a large | The primary 1-4- is mounted inside part of which may be constructed at home. | and at one end of the secondary on a 2%-For the fan who wishes to wind his own in ch diameter tube and contains fifteen

the handwork was eliminated and a more | coils the following data is given: The coil 1-6-4-5- is the antenna coupling coil and tunes the grid of the R. F. tube.



The wiring diagram of the circuit herein described

Editor's Note .- The various pieces of apparatus referred to in this article were actually selected by the author, and employed in the construction of the receiver described. This does not imply their superiority over equally efficient standard apparatus of other manufacture which may be substituted with discretion.

turns of No. 28 D. S. C. wire, tapped at the fifth, tenth and fifteenht turn. It should be mounted with about one-eighthinch clearance between it and the secondary. The secondary coil 5-6 contains forty-nine turns of No. 22 D. S. C. wire on a three-inch diameter tube and is tuned by a .0005 mfd. condenser. The coils here specified were spaced twentysix turns per inch, and if any other spacing or other condensers are used allow-, ance must be made for this. If there are more than twenty-six turns per inch the total number of turns in the coil must be reduced proportionately, or if less than twenty-six turns per inch are used the coil must be made longer. The taps on the primary coil provided for increasing or decerasing the selectivity of the R. F. stage act as a volume control, and they should be arranged with some sort of a plug arrangement, or may be carried out to a top switch on the front of the panel. The detector tuning coil is rather diffi-

cult to construct. The primary coil No. 1-3 has twenty-eight turns of No. 28 D. S. C., wound close together in a 2%inch form, and is tapped at the fourteenth turn. This coil fits inside the secondary coil No. 4-5 with about one-eighth-inch clearance. The secondary coil has fortynine turns of No. 24 D. S. C. wire and is three inches in diameter. The ticker coil is 11/2 inches in diameter and has thirty turns of No. 28 D. S. C. wire closely wound, and should be so mounted that it may rotate on an axis three-quarter-inch above the top or grid end of the secondary. The secondary of this coil as used by the writer was space wound twenty-six turns per inch and was tuned with a .0005 mfd. straight line frequency condenser, and allowances must be made in the number of turns for any change in spacing or condenser capacity.

The balancing condenser connected between the grid and plate of the R. F. tube should be a variable of the midget type, having a capacity of about twenty mfds. The grid condenser has a capacity of .00025 mfds. and was used with a grid leak of two to five mebohms, depending on the tube used. The filament of the radio frequency tube is controlled by a 25-ohm rheostat, and for convenience all the other tubes were controlled with amperites. A single 10-ohm rheostat may be used to control all of them, although this makes extra and needless controls in the panel. Care should be used in selection of the audio transformers, and only those

(Continued on page seven)

#### Secretary Hoover Favors Radio plete check upon sither arbitrary, unjust or exponeous section by an appeal to the courts, by which any control and a Few of Its Bill Now Pending in Congress to the courts, by which any controverted question is determined independently and de novo. I have

Head of Department of Commerce Says It Is of Ex- granting of radio privileges was too treme Importance to the Listening Public; Radio Legislation Is Absolutely Essential

The following is the statement of Herbert Hoover, Secretary Commerce, before the Committee on Merchant Marine and Fisheries, on Radio Bill H. R. 5589.

The Radio Bill, H. R. 5589, on which this hearing is based, is the culmination of the great amount of study and consideration which regulation, such, for instance, as the the widespread misunderstanding has been devoted to conditions during the past few years. The sub-assignment of a particular wave surrounding this subject, J. Louis jectd is of the greatest importance to our people. The radio public length to a given station, which may Reynolds, chief engineer of the is now numbered in millions and embraces every class in every sec-properly be left to the judgment of a Sleeper Radio Corporation, explains tion. When we consider legislation, we deal with matters which profoundly and intimately affect the daily lives of these millions of broader and more important matters, corrects a few popular myths sur-American citizens. They are entitled to radio service on the highest such, for instance, as the determinaplane that inventive genius and mechanical progress permit. The law in force in the United States to-day does not permit of the establishment of such a system. The situation and the service can be improved a large element of discretion and in only by careful regulation under legislative authority. I consider it which it is wise to have the con- an indoor type, such as the cage-like highly important to the development of this great means of public sensus of several minds. Such de- "loop" is employed, it is not necescommunication that legislative relief be given at the present session cisions, especially where the ques- sary that the windows of the room

ject hastily. It has received ex- correction of this condition. haustive consideration from all angles. Your committee devoted time and study to a similar bill at the last as settled. First, radio legislation is session of Congress, and after lengthy absolutely and immediately essential

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#### Radio Conference

You have also before you the recommendations of the fourth national radio conference, which considered the subject at its meeting at Washing ton in November of this year. This conference was made up of some draft, which I consider of the great-600 representatives of all the numer- est importance, are as follows: ous classes who are interested in lows these recommendations.

tion in broadcasting. This situation lines. to broadcast daily becomes more other deficiencies in that law. widespread, the demand for licenses steadily increases, we have to-day

now fall into the following classes: . Amateurs ...... 15,111 Ships ..... 1,901 Land stations..... 558 Broadcasting ...... 536 broadcasting class.

#### Broadcast Wave Band

below effective use. No two statons lengths to-day, and under the procan operate at the same tme in the visions of the bill there need be no same vicinity on the same wave fear that vested interest will ever length. There must be certain override governmental control. cal separation and other expedients sedes the desire of any individual order at all in the ether. There are feature in the radio law. some 250 applications for new Fifth—It vests in the Secretary of stations before the department now. Commerce th power to grant or re-If they were allowed, and the number fuse licenses, but this power is so thereby increased by nearly 50 per limited as to obviate the possibility cent, the whole broadcasting service of its arburary exercise. The Secrewill be affectively cestroyed. From tary is required to make his deterthe viewpoint of public service we mination with public benefit as the

I think, therefore, that in discusshas already received substantial approval, and third, the principles detry and the radio public.

Features of This Draft The distinctive features of this

First-The bill affirmatively as radio development, including broad- serts and assumes jurisdiction in the cast listeners. Some of the members Federal government over all phases of this committee attended its of radio communication in so far as sessions and are familiar with its such communication constitutes or proceedings. The conference adopted affects interstate or foreign comresolutions expressing the views of merce. I believe that Federal suits rembership as to the principles premacy is absolutely essential if upon which legislation should be this system of communication is to based. H. R. 5589 substantially fol- be preserved and advanced. There can be little question of the inter-The primary condition that makes state character of this service. Every egislation necessary is the conges- word broadcasted traverses state

has existed for some time. I have Second-It provides an administrahoped that natural laws, working tive organization by which Federal with scientific and mechanical ad- control is to be exercised. It revance, would themselves solve the quires a Federal license as a preproblem without legislative interven- requisite to the operation of a transtion. But such has not been the mitting station. This license system case. Inventive genius has not been has been in effect since the passage able yet to furnish us with more of the cat of 1912, and has demonbroadcasting channels. The desire strated its soundness in spite of Third-It retains complete control

in the Federal government of all more powerful stations in operation channels of radio communication. It and more applications that cannot be declares that there shall be no owngranted than ever before. The law ership or vested right in wave lengths h asimposed the duty of providing and the period of use allowed under for every applicant so far as possible, the license shall be limited to five wit hthe result that we now have too years, subject to renewals. In so much crowding together, unscintific doing the bill carries into the law reographical distribution, overlap- the system which now exists by deing confusion. The interference be- partment practice. While the law of ween stations has become so great 1912 contains no limitation whatever as to greatly minimize their public on the license period, so that long time privileges or perpetual franchises might have been granted, the department has been heedful to prevent any such situation. It has limited its licenses to short periods. Ship and amateur licenses run for two years, land stations other than making a total of 18,096 stations, broadcasting one year and broadcast-The principal administrative probling ninety days. Due to this policy lems, however, are confined to the there is to-day complete govern mental control of air channels, and the situation is clear for your action. If the bill now under consid-The 536 broadcasting stations must eration is passed there will not be operate on a total of 89 wave lengths. autstanding a single broadcasting There are no more in the broadcst-license whose expiration outlasts the ing band. It is simply a physcal fact effective date of the law. There is and many of these wave lengths are no vested right in licenses or wave

separations between them. The prob- Fourth-It recognizes that the publem has been to try to divide 89 wave lic interest is paramount in all forms lengths among more than 500 stations, of radio activity. To that extent, the which means an average of over six bill adopts as to this service the prinstations to each wave length. Satis- ciples which has been found so effectfactory division has been a mathe- ive in the state regulation of public matical impossibility. Only by time utilities. It recognizes that the indivision, power limitation, geographi- terest of the public as a whole superhas it been possible to preserve any This is a new and highly desirable

need fewer stations rather than test and standard. There is a com-

always taken the position that unlimited authority to control the and reviews which are imposed upon

that power under the bill.

upon which the Secretary of Commerce desires their judgment. There are many ; rely administrative question of the persons who are to First of all, says Mr. Reynolds, exercise radio privileges under the radio aerial need not be entirely ex-

approbation of both the radio in ius- communications are required to ob- predominate. tain permits in advance of the construction of the stations. This is a valuable provision, since it allows the applicant to know the wave length on which the station will operate and the power which it may use before he actually begins construction, and to erect his station accordingly.

important provision.

failure to operate or for violation of law. This is another step in the recognition of the sound principle that public service is the basis for the license privilege. The exercise of this power is likewise subject to court review.

In the main, this bill accords with what I believe to be the present pub-

### And a Few of Its **Eccentricities**

The part the aerial plays in great a power to be placed in the the working of a radio receiver is hands of any one administrative offi- often the subject of inquiry among cer, ad I am glad to see the checks set owners. As some outfits require the use of outside wires and others Sixth-"ne bill provides for a na- get along with short indoor ones and tional commission of nine members to still others need no lengthy wires at which may be referred any question all, radio fans find that their usual conception of the aerial as an extions in the detail of administrative casting out of the air does not cover

rule of public interest, which involve posed to the amosphere in order to tions become controversial, should be kept open, contrary to the amus-You are not entering upon the sub- more. The present bill permits the properly be made by a board rather ing belief which many people held than an individual. To draw a legis- at one time and which many, in fact, lative line netween these two classes still do hold. The radio waves transing this bill we may take three facts of functions is difficult. It seems to mitted by a broadcasting station radime the line lies at the point of con- ate out into space, it seems, and are troversy over privileges. The judg- affected only by large bodies of metal. hearings unanimously reported a if we wish to prevent chaos in radio ment of the board is made finad and They travel practically unimpeded communications, especially broadcast binding, subject only to an appeal to through inert materials like wood, ing; second, the bill now proposed the courts. I consider this a highly brick, stone, non-reinforced cement and glass and lose little of their ef-Seventh-Applicants desiring to en- fectiveness in a passage through c'ared in this bill have received the gage in broadcasting or commercial structures in which these substances

> 2AHK is securing exceedingly good results with a single five-watt tube tually has communicated with amateurs in every part of the civilized





THE only way to bring in the foreign stations during TRANSATLANTIC TEST WEEK, January 24 to 30 is with highly sensitive head fones such as FROST-FONES. When you listen in between 11 and 12 p. m.

Eastern Time, or 10 and 11 p. m. Central Time. from Sunday to Thursday you will have a better chance to hear Europe with FROST-FONES than with any others because these famous fones are designed and built so as to be especially sensitive to weak signals. Without head fones you will not have much luck in hearing the foreign programs.

FROST-FONES No. 174-2000 ohm, \$3.00

No. 175-3000 ohm, \$3.50 Highly sensitive to weak signals

Due to our extreme carein winding coils, lapping shells, grinding magnets and testing and measuring **FROST-FONES** they are about twice as sensitive as most others. We could not be more particular of **FROST-FONE** quality if we built them to sell at ten dollars. Our vast production insures low prices. Our rigid inspection guarantees the quality. See your dealer NOW for as many pairs of **FROST-FONES** as your family will need for TRANSATLANTIC TEST WEEK.

HERBERT H. FROST, Inc. 314 West Superior Street Chicago, Illinois

The Enchantment of Distance FROST-FONES
The Joy of Clearness with

# · Attempt to Write

No corner of American life remains homes. In some of the plays subuntouched by the wizardry of radio, larly the washing machine, ironer and to judge from a preliminary survey vacuum cleaner—have been veritable the judges and the prize winners station WJZ for the New York Edison nick of time to prevent the home from near future. In addition to the \$500 the play or as invaluable servant to neglecting to bring into the home the diately after the awards have been connecting link between the transmankind. Radio as solace to the same standard of efficiency and the made. The judges in the contest, blind, as a joy to the old folks back labor-saving devices he demands in which is being watched as an interest-"flaming youth" at home and of wrights, one and all they announce world, are Cosmo Hamilton, the making the maid happy on her job, that the old regime of the slaving famous English novelist and playnot to mention it as an instrument wife is over and that from now on wright; James H. McGraw, president for spreading the gospel and even for Hiram must wake up and electrify his of the McGraw-Hill Company, pubapprehending escaped convicts-these home. are only a few of the uses the radio The changing character of radio radio magazines, and B. C. Forbes, dramatists have imagined for the audiences, not only in those who editor of "Forbes Magazine."

test. One of the teachers in Robert signature on the manuscript she dic. close with "O Sole Mio."

nr Jisher

The designer of the new Tower diaphragm, first won world fame by dis-

of the master violin

Aspiring Dramatists | College, Constantinople, wanted enter the contest.

periences in their own or neighbors' a United States Congressman.

most popular of modern miracles. | "listen in," but also in those who par-From Unadilla Falls (New York) ticipate in radio experiments, is De Muro, Italian Tenor, to to San Diego (California) and from strikingly illustrated in the list of Sing Famous Arias To-morrow Oregon to Florida, from almost every contestants who submitted manustate in the country, manuscripts scripts. It is evident that no station have been pouring into station WJZ of American life remains unaffected prizes for the three best radio plays the assistance of electricity. A illustrating electricity's contribution doctor submits the story of how he

to tated, tells how radio brought a new lease on life to her by restoring conother contestants are high school Play for Contest authors to be based on actual ex-

The plays are now in the hands of wife and young husband alike to developed into a good radio drama

### tact with the outside world. Among Includes Aerial and

Many of the plots are said by the teachers, newspaper men, professional teachers, newspaper men, professional GroundConnection cast by station WJZ at 8:30 Wednessional Connection cast by station WJZ at 8:30 Wednessional Connection cast by station wf at the description of the plots are said by the teachers, newspaper men, professional cast by station wf at the description of the plots are said by the teachers, newspaper men, professional cast by station wf at the description of the plots are said by the teachers, newspaper men, professional cast by station wf at the description of the plots are said by the teachers, newspaper men, professional cast by station wf at the description of the plots are said by the teachers, newspaper men, professional cast by station wf at the description of the plots are said by the teachers, newspaper men, professional cast by station wf at the description of the plots are said by the teachers, newspaper men, professional cast by station wf at the description of the plots are said by station wf at the description of the plots are said by station wf at the description of the plots are said by station wf at the description of the plots are said by station wf at the description of the plots are said by station wf at the description of the plots are said by station wf at the description of the plots are said by station wf at the plots are said by sta The meanings of the words antenna | York String Trio in a program of and aerial are quite often confused four selections. The trio is comwhen the radio fan attempts to dis- posed of Clarence Adler, pianist; of the manuscripts received at good fairies who came just in the they select will be announced in the cuss this part of the receiving circuit. Louis Edlin, violinists and Cornelius When speaking of antenna it means | Van Vliet, cellist. Dr. Henry T. Hour Radio Play Contest, which was going on the rocks. The radio in gold offered, Mr. Williams will also the entire system employed for col- Fleck is very well pleased with the announced in November and closed dramatists have found the young give \$100 for any play which can be lecting the radio waves from the manner in which the concerts are on January 1. More than a hundred blame for letting home life grow or may be adapted for the screen. ether or whatever the medium of instituted. Their prime purpose is aspiring dramatists "tuned in" on the irksome, the former for wearing hercontest, and in almost every manu- self out in unnecessary toil with to broadcast the prize winning plays reaching the receiving apparatus education in music necessary for real script radio figures either as hero of antiquated tools, the latter for from station WJZ will begin imme- through space. The antenna is the appreciation and enjoyment.

on the farm, as a means of keeping the office. As for the rural play- ing experiment throughout the radio includes the ground or counterpoise. in the air or above the earth. A loop is not an aerial but an antenna, as it the sole means of conducting the proceedings of the meeting of the lishers of numerous electrical and radio signals from space to the re-Bureau of Budget to be held in Wash-

Bernardo De Muro, distinguished ly different than an aerial or ground budget, concerning, as it does, tax Italian tenor, is to broadcast several connection, although when it is used reduction and economy in the operaas a result of the announcement that by radio. College professors and of his most famous numbers from a device is usually suspended in the President Coolidge has given partic-Arthur Williams, vice-president com- simple housewives in city apartment WJZ at 8:30 to-morrow evening. The air at a height of several feet and is ular concern, interest all taxpayers mercial relations, of the New York and country farmhouse agree that concert will last until 9 o'clock. It entirely insulated from the earth. It and citizens. Edison Company, would give \$500 in modern life is unthinkable without will include the famous "Ridi, Pag- acts as a capacity between the aerial, to modern home life. Even from far cured a serious disease with his liacci," and the "Improviso" from than receiving and is usually emoff Turkey came a request for in- electric heater, and a blind woman, Giordano's "Andrea Chenier." By ployed in the receiving circuit when formation concerning the play con- who is not able even to write her special request Mr. De Muro will it is impossible to obtain a low re-

Meistersinger

\*Little Spitfire 4.96
Midget Speaker
Phonograph Attachment 3.95
\*Scientific Headset 2.96
\*Little Spitfire Headset 1.95

The next of the Lewisohn free chamber music concerts, to be broadday evening, will present the New

mitting station and the receiver and President Coolidge to Address Washington Budget Meeting

On Saturday evening radio listeners of WEAF and a chain of stations will have the opportunity of hearing the ington, during which President Cool-The ground of an antenna system | idge will deliver an address. This is the connection to the earth, as the important meeting should be of out-A counterpoise is something entire- ers because the subject of national it takes the place of the latter. Such tion of government, matters to which





Ferris Radio Supply Co., 3180 Broadway, 1 Block So. of 125 St. Tel. Morningside 5613

Netson Radio Co., Inc.

Keystone Radio & Music Shop 221 Seventh Ave., 101 West 43d St., cor. 6th Ave.

Murray Radio Service
7 East 14th Street

TOWN TO THE

Reliable Hardware Store 303 Canal Street, New York City. Tel. Canal 6763.

Perfection Radio Co.. 58 Cortlandt Street.

Broadway Radio Co., 148 Pearl Street, New York City. Tel. Bowling Green 5961.

## for the wonderful new Jower Diaphrasm TOWER DIAPHRAGM—THE MOST IMPORTANT DISTRY in OVER 50 YEARS of EXPERIMENTATION of Experimental File of the persons submitting names of me. Graham Bell invented " Graham Bell invented " Graham Rell invented receiver with its all-metal Diaphgram. Until now the world's greatest acoustical experts have been unable to effect any radical improvements on this type. Now-after exhaustive experiments, Dr. Herman Fisher, the eminent Russian Scientist and acoustical expert of the Tower Co., has perfected a marvelous new Diaphragm, revolutionary in principle and unparalleled in performance. The Diaphragm consists of two different materials, one of which reproduces the upper register of the scale, and the other, the lower, making it a veritable double Diaphragm

officials will be final. In event the winning name is suggested by more than one person, the prize will be divided equally. TOWER MFG. CORP., BOSTON, MASS.

WORLD'S GREATEST SPEAKER VALUES

which brings out ALL the notes with an amazing mellowness of tone, increased volume and COMPLETE absence of distortion, hitherto never attained in a radio loud speaker.

The name "HIGH-LOW TONE" has been suggested but we

believe some one can suggest a better one. Let us have yours

—it may win the \$500 prize or one of the 1000 additional

YOUR CHANCE TO WIN AS GOOD

AS ANYONE'S

Names must be submitted on U. S. postcards with name and address of sender clearly printed-no others will be con-

sidered. Send as many names as you wish. Contest closes

February 15th, so act promptly. Decision of Tower Company

### Up-to-the-Minute News of Radio in Pictures



Rufus P. Turner, Washington D.C. High School Student, operatito Station 3 JF.

Henry Ford's Oldtimers' Dance Orchestra.

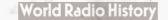
broadcasting through WEAF.

POTO CRAMS

Rabbi Lyons Monsionor) Belford, nd Dr.S. Parkes Cadman broadcast through WAHGat banquet of Parents and Teachers Assn. of Adelphi

Academy,

Brooklyn



### R. F. Resistance and Inductance of Coils

(5) Percentage decrease in the ratio of inductance to resistance below the value

In Figures 1 to 5 inclusive the curves show the extent to which these different characteristics exist in the six coils under discussion. In these graphs curve A represents the single-layer coil. B the radial basket-weave coil, D the honeycomb coil, E the two-layer coil, F the narrow basketweave coil and T the loose basket-weave coil. The figure 28 after the letter indicates that the coils were wound with No. 28 AWG d. c. c. wire.

In Fig. 1 the inductance in microhenries of the coils is plotted against frequency in kilocycles, and the curves indicate the apparent inductance of the coils at different frequencies. The value of the apparent inductance of a coil should not be too large at the frequency at which it is used, as a large percentage of the increase in its value is due to the distributed capacity of the coil. From the curves it is therefore easy to see that Coil T proved to be the most satisfactory and that A runs a close second. The twolayer coil is very poor, as it acts similar to a condenser in the circuit; the same also applies to the honeycomb.

The radio-frequency resistance of the six coils at different frequencies is indicated by the curves in Fig. 2. The value of this resistance, it is hardly necessary to say, should be as low as possible overthe range of frequencies on which the coil is to be used. Again it is easy to see that Coils T and A have the lowest resistance and are therefore the most satisfactory.

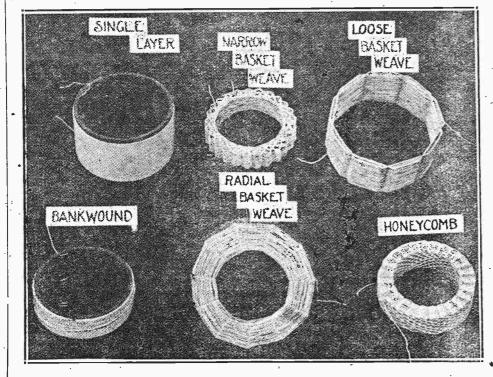
The ratio of the increase of resistance over its direct current to the direct current value of each of the six coils is shown by the curves in Fig. 3. As the value of this ratio should be as low as possible, again Coils T and A best answer the requirement.

The value of the ratio of inductance to resistance should not be small on the oprating frequencies as compared with the value obtained at 1 kilocycle, and, therefore, the curves in Fig. 4 indicate that Coils T and A are most efficient in this respect. This ratio predetermines the sharpness of the resonance point which a circuit containing the coil will have.

Again in the last method of comparing coils, Fig. 5, where the percentage decrease in the ratio of inductance to resistance of the six coils is shown, Coils T and A remain the best, for this value should not be unreasonably large if maximum efficiency is to be had.

By examining all of the curves it can

(Continued from page two)



Courtesy of the United States Bureau of Standards

The six types of coils tested in the radio laboratories of the United States Bureau of Standards. From left to right (above)-Single layer solenoid, narrow basket weave coil, loose basket weave coil; (below)-Two layer bank-wound coil, radial basket weave coil, honeycomb coil.

coil T, the basket weave type, is the best in-every instance, and that coil A, the single-layer coil, is the next best. Coils B, the radical basket weave, and F, the narrow basket weave, almost tie for third place, but coil B is slightly better. In every instance coil D, the honeycomb, comes in fifth, and coil E, the two-layer coil, sixth. It also will be noted that on wave lengths above and below the broadcast band coil A is either equal or slightly better than coil T.

Another interesting fact brought to light by the tests is the effect of different sizes of wire on the radio-frequency resistance of a coil. The curves in Fig. 6 show how the resistance of a single layer coil changes when different sizes of wire are used. It will be noticed that in all wave lengths between 1.500 and 200 meters No. 32-38 Litz wire has the lowest resistance. Of the solid wires No. 24 is probably the most satisfactory. These curves are very similar to those obtained with other types of coils. However, in most cases the résistance of coils wound with Litz wire increases enor-

vicinity of 1,500 kilocycles (200 meters) In the past, the chief argument against the use of Litz wire has been that its resistance increases enormously if any of the strands are broken. This statement has also been disapproved by the tests. In the case of No. 32-38 Litz wire there are thirty-two strands of No. 38 AWG enameled wire braided together. If a piece of this wire having a resistance of 3.1 ohms is taken and six strands are broken, the resistance increases about .3 ohm. As it is seldom that the experimenter would break more than 6 strands, it can be seen that the increase in resistance is not serious. It also is interesting to note that even if half of the strands are broken the resistance does not double, but increases to 5.4 ohms.

The increase in the radio-frequency resistance of a coil caused by the use of insulating varnishes or binders was also measured by the tests. Five different types of binders were compared. They were collodion, commercial insulating varnish B, commercial insulating varnish A, cross section. If solid wire is used it is shellac and paraffine. It was found that | not necessary to use larger than No. 24 be seen that on the broadcast wave band | mously on the high frequencies in the | on wave lengths in the vicinity of 1,000 | AWG gauge.

meters the insulating varnish did not affect the resistance of the coil, but that as the wave lengths increased the effect was much more noticeable. On 200 meters, for example, the resistance of a coil coated with paraffine increased from 14.2 ohms to 18.5 ohms. Collodion is found to be the. most satisfactory binder for coils, due to the fact that it has less effect on the resistance of the con and that it dried very much quicker. In the 14.2 ohm coil previously mentioned collodion increased the resistance to 14.4 ohms on 200 meters, commercial insulating varnish B to 15.9 ohms, commercial insulating varnish A to 16.4 ohms, shellac to 17.2 ohms and paraffine to 18.5 ohms. On wave lengths below 300 meters a material increase in resistance of coils could not be noted when insulating varnish or binders were applied.

The results of the tests may be summarized as follows:

(1) The various experimentally obtained curves that appear on this page can be used as a design basis for comparing coils of the six types for any frequency in the broadcast range.

(2) The curves shown in figures 2 and 5 give the changes of resistance and of the ratio of inductance to resistance with frequency. High values of these ratios do not in all cases correspond to high values of radio-frequency resistance.

(3) The curves in figures 2 and 4 give the actual radio-frequency resistance and the ratio of inductance to resistance as various frequencies.

(4) Of all the coils measured the loose basket weave coil and the single layer coil and next to them the radical basket weave coil wound on hard rubber, have the lowest radio-frequency resistance. The two-layer coil, the four-layer bank wound coil and the honeycomb coil have the highest resistance. This, however, cannot be generalized to other frequencies. For instance, for low frequency sets (20 to 100 kilocycles) the multi-layer bank wound coil and the honeycomb coil have a relatively low resistance and are good mechanically, while other types have no special advantage

(5) There appears to be little reduction of resistance at low frequencies in spac-

(6) All insulating materials which were used as binders caused very slight increase in the resistance of coils. Cellodion was the most satisfactory.

(7) The use of No. 32-38 Litz gives coils a somewhat lower resistance than coils wound with solid wire of the same

### If Announcers Used an Alphabet Code Calls Would Not Be Misunderstood

Famous Calls in Their New Dress?

"This is Station Watch-Joy-Zed broadcasting. You have just heard a

number given by the Philharmonic Quartet." . . . Or it may be Station

King-Dog-King-Able on one of its international tests, and then W-Get-Yaw

Are You Able to Recognize These

will probably fill your room with voices of a radio playlet.

ROADCAST fans whose radio sets ! and ears were sensitive enough to "catch" the mysterious long-distance sounds of the battle fleet in winter maneuvers have had a thrill which the runner after highbrow opera music and common jazz have missed.

It is indeed a mysterious thrill to hear such a message as this: "Hello Cast Oboe \ Eight: Watch King Five calling, Answer please!" And the comeback: "This is Cast Oboe Eight answering Watch King Five. What is your QRA? Answer, please!" And so on.

But it gets far more thrilling when quick, flash-like phrases and snapping sentences: "Dog-Able-Easy-George!" "King-Item-Nan-Boy!" "Squadron M-Pup-Unit-Love . . . Squadron O-Quack-Tare-Vice . . . King!" One with imagination can well understand what is taking place, especially if he has been at sea. on one of Uncle Sam's fleet destroyers or massive battleships.

#### The Mystery of the Code

Those spoken signals are nothing more than code groups by means of which the evolutions of the squadrons are directed. Radio adapts itself particularly to this work because it is swift, sure and efficient. It beats the flag and halvard signals every time, and isn't in the race for visibility.

The Navy Radio Service is justly proud of its radio system. During the war it developed an alphabet code which was to be used for the new radio-telephone apparatus installed on some of the finest units of the navy. This was long before broad-

Even at that time the problem of pro-

There will be no mistake in your identification of the call letters. Those stations will be using one or the other of these codes to make it easy for you to tell the one you have at the time: Able, Boy, Cast, Dog, Easy, Fox, George, Have, Item, Joy, King, Love, Mike, Nan, Oboe, Pup, Quack, Rush, Sail, Tare, Unit, Vice, Watch, X-Ray, Yacht, Zed.

Or, as the English would have it, Ac, Beer, Ced, Don, E, F, Get, Ash, 1, J, Kur, L, Emma, N, O, Pip, Q, R, Esses, Tot, Up, Vic, W, X, Yaw, Zig.

radio. Every navy man will remember | Sugar, Orange calling. Switching on and the Able, Boy, Cast, Dog Easy lessons which attempted to fix in his memory the whole new alphabet for use in all of the signalling work.

It was made up of words of one or two syllables, easy to pronounce, and still easier not to confuse. Each one had a distinct sound, and such letters as "e." which has a similar sound to "p" and "d" cannot be taken for one another with this system. The letter "E" is "Easy" in navy code; "P" becomes "Pup" and "D" is "Dog."

#### **Another Code**

The navy of H. M. the King of England had also adopted a system of code alphabet which is still more mystifying than the American one.

It is indeed disconcerting to hear such nunciation was a big one, specially for a | talk as this while listening to some Engservice with the military significance of "lish broadcasting: "Hullo, Croydon Pip,

over!" Croydon, of course, is the great aviation field near London, and this is an airplane's signals.

This talk is going on at about 900 meters wave lengths, and consequently does not interfere with the usual broadcasting. Once in awhile one will hear an airship asking for a position, and the signals will sound more comprehensible: "Hullo, Croydon! Hullo, Croydon; Imperial Beer Ink speaking. Please give me position?"

It should be explained that the Imperial-Beer-Ink appelation refers to a ship of the Imperial Airways, the call letters of identification being "B'I." French ships are denoted by the make of the machine, such as "Bleriot," while the ships of the Dutch Company are identified by the "KLM" group of letters.

Only occasionally does the airship send cut a call for help. And the radio fan

would hardly recognize it as such. "Mayday Mayday Mayday. Imperial Ash Emma. Broken propellor six miles east of Dover."

The American way would be a little more humorous, for the radio listener would hear the following register at his receiving station: "Sail Oboe Sail. . . . . . . Sail Oboe Sail! Engine trouble develop-

ng. Sail Oboe Sail.". However, air "S O S" signals are very rarely recorded and are used only in cases of extreme necessity. In most cases the ships "make port" at the nearest air field without further difficulty.

#### Messages Foolproof

So proficient have the operators become in the use of these alphabet signals that they use them with great ease. They make the dangerous business of handling messages absolutely foolproof, and give the message itself a flavor it would be lacking if transmitted in the old flat codeletter style.

It would be interesting if our American broadcasting stations took to the fad of using these special code alphabet letters to denote their own call letter signals.

It is a fact that many broadcast listeners are confused by the similarity of sound between not a few letters of the alphabet. When doing long-distance receiving this deficiency of our tongue is specially to be regretted by the die-hard fan-he who stays up the night to hear some elusive station.

In fact, such call letters as WGY. KDKA, WEAF and KSD have been understood by American as well as foreign listeners to be variously, "WCY," "KTKA," "WCAF" and "KST." At least European

(Continued on page fifteen)

#### 500 Radio Stations To Be Silent To-night for International Tests

Fourth Annual Radio Week Will Be Marked With Programs of Popular Flavor; Listeners in Seventeen Countries To Be at Sets

VERY broadcasting tation in Cuba, Mexico, Canada and the United States will be silent for a full hour this evening, and for four days thereafter, according to officials of the fourth annual International Radio Week Committee who have headquarters here, while three-fourths of the broadcasters in the United States, Canada, gram to celebrate its fourth anni-schedule and arrange for American stations to "shut down" in order Mexico and Cuba will be silent in the same hour on the last two days of versary. the week when broadcasters in North America conduct the first North American distance test.

stations will give their call letters listeners. in several foreign languages in this and listeners will soon grow familiar casters regularly scheduled to operthe voices of foreign announcers who schedule at 12 midnight, eastern time, both plan special musical programs shield and reflect the radio waves. the "beat note" method should never will come on the air in special pro- or 9 p. m. Pacific Coast time. grams for American fans will have a familiar ring.

#### British Broadcasters To-night

In the first night of the tests, Brit ish broadcasters will fill the air with their programs, some of the foremost radio stars of England being scheduled to appear before the microphone in special programs. When it is understood, that while 11 o'clock in New York is only 8 o'clock in California, it is 4 in the following morning in London, and 5 at Berlin American listeners will realize that the foreign stars are inconvenience effort to entertain Yankee listeners. Monday night stations scattered be heard, while on the three follow- to test their sets in advance, counting nights both English and Conti- ing on the wave length adjustment nental stations will be on the air, to bring in the desired distant station with the possible addition of stations the minute the local broadcaster on in Scandinavian countries as well, the same wave has become silent. Station OAX, of Lima, Peru, South Special programs are being ar-America, will also be on the air in ranged by the station which will parthe International Tests, transmitting ticipate in the North American tests. at the same period as the foreign with frequent announcements of call stations.

work in charge, has arranged to re- tion. few days after the tests are completed. They will also be available for checking claims of distant reception by local radio fans.

On Friday and Saturday the plan of broadcasting will be varied. In the North American continent that in the Atlantic City High School. have perhaps never come into the listener's set before because of con-

#### Local Tests

ary 29, all broadcasters in the United and Marathi, the language used in States, Cuba, Mexico and Canada will Southern India.

| Circuit—which is similar to the ordinary regenerative receiver—and comfrom WBOQ on Monday evening. The listeners. shut down as usual, except the broadcasters in the Atlantic and Eastern standard time zones. These stations will have the North American air free for them for fifteen minutes. when it is expected that many Pacific Coast listeners will log Eastern stations for the first time.

Following the first fifteen-minute period the Eastern stations will shut down with the broadcasters of the central time zone-occupying the air. At listeners in South Africa will be able Orchestra Under Jos. Knecht tenna circuit. This means that the S. S. Paris Orchestra in Special promptly 11:30 Eastern time the cento hear Tuesday evening's program tral time stations will shut down, of WOC, Davenport, which is being ches ra, which is heard in an unusual with the mountain stations filling the air with their programs. At 11:45 Eastern time, or '8:45 Pacific time, the mountain stations will sign off and broadcasters on the Pacific Coast will take up the programs, occunving the air exclusively for the fifteen minutes remaining of the silent period.

North and South Programs

On Saturday, January 30, at the WEAF is the controlling link,

The test hour will come at 11 when the Canadians sign off for the o'clock, Eastern standard time, to- rest of the silent period, while night. In the hour preceding this, broadcasters in the southern half of international tests, and plans to cult feat to accomplish than the rebroadcasters in the United States the United States will occupy the air canada, Cuba and Mexico will trans- in the third quarter of the hour. At mit special programs for the benefit 11:45 eastern time, all broadcasters of radio listeners in foreign coun- will be silent except those in Cuba tries, extra power being used in and Mexico, where special programs many cases. Announcers at American have been arranged for Canadian speakers in seven different languages as many barriers to retard the pas-plate coil or "tickler" correctly inter-

first period, 10 to 11 Eastern time, the international test period broad- European reception on Sunday. with the languages used, so that on ate will come on the air in their the entry of the American silence regular programs, picking up the 300 meters, Buenos Ayres, Argentina, est in the United States, tend to tion with a regenerative receiver

In order that there will be no con- to 12 Eastern standard time. fusion on the part of broadcasters and station directors, every operator in charge of a radio station particition of the country with sufficient tests. volume to bring in the time signal on a single tube set without difficulty.

Setting Receivers In view of the fact that many ing the week of the test. broadcasters in widely separated sec-

letters and station location. In most In view of the late hour at which cases the programs presented will be the broadcasters will face the micro- of the type that has in the past phone overseas the Radio Week Com- proved itself best for long-distance mittee, who have the details of the reception to the operator of the sta-

ceive from the broadcasters overseas | International Radio Week, now in who are active, complete logs of their its fourth year, has the indorsement fifteen radio trade bodies.

Executive headquarters for the 20,000 watts of power, respectively. radio week committee and the international tests are maintained at 1133 Broadway, New York City.

French, German and other foreign cert played on the Grand Midmer- Daventry, 1,600 meters. announcers the listeners will have an Losh Organ, reputed to be the largest opportunity of hearing stations on organ in the world, which is located 2LO, London, will broadcast.

enable fans in foreign countries to carry excellently in radio. Beginning promptly at 11 o'clock identify the station. Included in Eastern time on Friday night, Janu- these are Chinese, Japanese, Arabic

> Consuls from at least three dif- intervals. ferent foreign countries, perhaps more, will appear on the program of language of the consul.

It is expected that many radio Goodrich Silvertown Cord on 41.9 meters from 379.5 meters.

United States will come on the air, calling on radio officials and promi- popular dance organization.

Schedule to be followed by the European stations participating in the International Radio Week tests will be found on the radio pages, Section 2, of to-day's Herald Tribune

nent stations in England and Europe to arrange final details in connection

On the fourth day of the test (Wednesday) WLW, Cincinnati, will

Eric Palmer, member of the in-

will be a feature of the program to sage of radio waves. For instance, ference will be reduced to a minimum. Each night after the conclusion of be broadcast by KFUO. St. Louis, for the radio wave coming from a station In the first place, the detector tube

every evening of the tests from 11 Then, too there are a number of be used. When tuning in this manner,

editor, sailed January 20 on the signals. On the other hand the radio the carrier wave of the station he pating in the American tests will set steamship Laconia on an around-the- wave that passes over a water route desires. This means the set is in the his watch each night by the Arling- world cruise and has been appointed has practically no obstacles to over- oscillating state during the entire ton time signal, which is broadcast official observer by the international come, and therefore reception of time the set is in operation. Instead not only from Arlington but re- radio week committee to listen for European broadcasting stations ought the operator of this type of receiver broadcast by several American sta- American, European and South Amer- not to be difficult. tions covering practically every sec- ican broadcasting stations during the

> KHTS, Hot Springs, Ark., will feature special French programs dur-

same wave length, it is more than James J. Walker, will broadcast his radio frequency receiver. With a set throughout Continental Europe will possible that fans will find it possible greetings to Europe through WNYC of this type 3,000 miles over water

> grand opera "Martha" on Monday evening during the test period. WJZ plans to provide Europe with

jazz music from George Olsen's dance

orchestra on Tuesday evening.

Frank Tower, of Boston, left for type of set caused considerable inter- radio frequency receiver is not so Bermuda on January 21, where he ference during the reception of Euro- apt to radiate, because it is neutralwill remain during the International pean broadcasters last year. A num- ized to prevent oscillations of any Radio Test to make observations.

On Sunday evening between 11 p. programs, showing how they differ of radio trade bodies in every section m. and midnight three English sta-barely audible, when a "blooper" izing the circuit. If this happens to from the advance programs. These confirmation programs, as they are United States being under the direct America. They are 2LO, London, 365 spoiled reception. Other fans restyled, will be prepared and edited tion of an executive committee commeters; 6BM, Bournemouth, 368 me- ported hearing carrier waves of sta- this type of receivers should examine by the committee and published a posed of representatives of more than ters, and 5XX Daventry, 1,600 meters. tions, rather they thought they did, them before the tests, to determine The stations use 3,000, 1,500 and and tuned around for several min- whether or not they radiate. All in

English stations will broadcast: 5WA, WPG, the municipal radio station, Cardiff, Wales, 353 meters, 500 watts, the customary silent hour, instead Atlantic City, will open its test 1,500 watts; 2BD, Aberdeen, Scotland, of hearing the voices of English, program on January 24 with a con- 495 meters, 1,500 watts, and 5XX,

On Thursday evening it is expected

During their test program WOC. programs from Daventry will feature gestion caused by local transmissions. Davenport, will broadcast announce- cornet solos and cornet accompani-Davenport, will broadcast announcements in fifteen foreign languages, to ments as this instrument is known to ordinary receiving vacuum tube, ap-

The international test program

from WBOQ on Monday evening. The municate with stations several thou-Bel Canto Mixed Quartet will sing at

Mr. L. A. Nixon, secretary of the Station WIP, Philadelphia, during the International Radio Week Committee, the "single circuit." This type of re-other distant points, cannot be special broadcasts for overseas lis- has established his headquarters at ceiver is slowly but surely becoming heard. The fan who lives in the teners on January 28. These ad the Hotel McAlpin. Communications extinct, but there are a large number Middle Western states will have just dresses will be given in the native relating to the tests may be sent to still in existence owned by fans as much chance of hearing these him at that address.

The Goodrich Silvertown Cord. Orrebroadcast by WGY, Schenectady, hour's program of dance music each is the ideal condition for transmit-A. Atwater Kent will attempt to WFI, WTAG, WOO, WCCO, KSD, radiator, it is also true that it is by WOR when the orchestra of the of American radio development and WLIB from 10 to 11 o'clock, renders cast signals because of its natural musical achievement by broadcasting its selections before WEAF's micro- tendency to be non-selective. a concert of the New York Symphony phone under the musical direction of Another type of regenerative re- Pier 57, North River, New York. Of-Orchestra on Sunday through a Joseph Knecht, who is well known to ceiver which radiates an interfering ficials of WOR and the French Line chain of fifteen stations, of which the radio audiences through his serv- wave is the well known three-circuit have made elaborate plans to present ing as director of music at the famous tuner. However, when a receiver of a program interesting to both Amer-Waldorf-Astoria Hotel. Mr. Knecht this type is in the hands of a good ican and French radio fans, and betions will have the air free in an all Thornton Fisher, famous sport is the organizer and leader of the operator it will not cause a great Canadian period, broadcasting from writer and radio speaker, is now in Silvertown Cord Orchestra and has deal of interference to other listeners. lieve that through such programs a 11 to 11:15 eastern time. The broad- Europe as an envoy of the interra- lent his wide knowledge of the best It is inductively coupled to the an- greater feeling of goodwill can be casters in the northern half of the tional radio week committee. He is music to the development of this tenna and is called the three-circuit established between the French and

#### European Reception Should Not Be Difficult With a Good Set

Radiation Interference Will Be Chief Drawback to Satisfactory Results; Regenerative Receivers Are the Worst Offenders

HIS, as every ardent radio fan knows, is International Radio Week, during which, it is hoped, many foreign broadcasting stations will be heard in this country. A great deal of care has broadcast a twenty-three hour pro- been exercised by members of the committee to organize a broadcasting to facilitate reception.

During the last few years many namely, antenna circuit, grid circuit listeners have reported transcon- and plate circuit. ternational radio week committee, ex- tinental reception. This, in the To prevent a receiver of this type pects to return to America during the writer's opinion, is a far more diffi- from radiating adjust the coupling

Last year's tests were fairly suc-Last year's tests were fairly successful. Many fans located along the tion control may be advanced to a Atlantic seal oard reported receiving English, French and Spanish stations. This year it is hoped the tests will be even more successful. Listeners are be remembered that with a set of better equipped, as a large majority this type, if it is allowed to oscillate tions of the country operate on the . The Mayor of New York City, of them now boast of a "five-tube" should be easy, providing the proper ceivers will not cause interference. conditions prevail. Advanced weather

> week of the tests. find out later that it was some other caused by such receivers.

On Tuesday evening the following listener with a radiating receiver. The owner of the "blooping" radio and is capable of being an excellent receiver, little realizes that he is the radiator is the super-heterodyne. possessor of a minature transmitting This type of set should never be used set, and that it is capable of trans- with an outdoor antenna, as it is apt mitting over a distance of five or six to cause serious interference. It has miles. As a matter of fact, licensed what is termed an "oscillator," which amateurs have been able to communi- is nothing more than a miniature It has been announced that the programs from Daventry will feature cuit of their receiver. Other amainst the cuit of their receiver. ply several hundred volts to the been implied, is to show that any plate and connect it in a transmitting type of releiver, if properly operated, sand miles distant.

worst offender is without a doubt well as those in South America and ignorant of their radiating character- stations as those located along the istics. The single circuit type of re- Atlantic serboard. ceiver is directly coupled to the anoscillatory part of the circuit has Program Through WOR Wed. direct contact with the aerial, which Thursday evening by the radio fans ting. In addition to the fact that important program in the Internaof WEAF, WEAR, WEEI, WGR, WWJ. this type of set is an excellent tional Test Week will be broadcast

ception over land is far more diffi- of the coupler should be placed as far cult than over water. This is true from the secondary coil as possible. An address delivered by seven because on the water there are not Then, if the operator controls the

on the Pacific Coast to New York has should never be allowed to "spill the Rocky Mountains to transverse. over," that is, break into audible Station LOX, 375 meters, and LOW, These mountains, which are the high oscillations. When tuning in a stalarge cities located in the Middle the receiver is allowed to oscillate West with their steel frame build- and the operator adjusts the wave Paul McGinnis, radio writer and ings which tend to absorb the radio length control of the set till he hears should tune without allowing his receiver to oscillate, and when the depoint where the loudest signal is heard without any tendency on the part of the set to oscillate. It must the quality of reception is extremely

Most types of radio frequency re-However, one must not gain the opin-Station WEAF will feature the forecasts show that the atmospheric ion that radio frequency receivers conditions will probably be of the do not oscillate, because they dobest for radio reception during the some types more than others. The type which uses a potentismeter to One problem which still exists, control the feed-back is an excellent however, and was very much in radiator. However, if properly handprominence last year, is interference led it will cause no interference caused by radiating receivers. This whatsoever. The neutralized type of ber of listeners reported that they kind in the radio frequency and dewere on the verge of hearing the tector circuits. All radio frequency call-letters of some station just receivers have some device for stabilutes trying to hear a voice, only to all, though, little interference is

Another type of radio receiver which seems to be growing popular

The purpose of this article, as has

During the tests which take place this week there is no reason why Of the regenerative circuits the European broadcasting stations, as

At 9:30 on Wednesday night, an

in the salon of the vessel docked at

The state of the first of the

m.—Organ recital.
—Musical program by artists.

m.-Children's period.

1380k-WOK-CHICAGO-217m

artists. 870k—WLS—CHICAGO—345m

5.00k—WLS—CHICAGO—345m
p. m.—Bell concert; organ; story.
560k—KYW—CHICAGO—536m
p. m.—Dinner concert.
.35 p. m.—Farm speeches.
p. m.—Good reading; musical.
p. m.—Edison hour of music.
2 midnight—"Evening at Home."
.3 p. m.—Insomnia Club.
.670k—WMAQ—CHICAGO—448m
p. m.—Ofran recital and orchestra

p. m.—Songs; chimes, 670k—WQJ—CHICAGO—448m

p. m.—Rainbow Orchestra. midnight—Dance music; artists.

p. m.—Classical program.
45 p. m. (238 meters)—Orchestra.
130 p. m.—Entertainers.
midnight—Entertainment.
a. m.—Your Hour League.
1130k—WENR—CHICAGO—266m

p. in.—Dinner concert. m.—Midnight jamboree. 1330k—WBBM—CHICAGO—226m

FRIDAY

660k-WJZ-NEW YORK-455m

660k—WJZ—NEW YORK—455m

10 a. m.—Topics for women.

11:45 a. m.—Market reports.

12:15 p. m.—Friday hoon hour of music

1 p. m.—Ambassador Trio.

2-4:30-5:30-7:15-10:30 p. m.—News.

2:02 p. m.—Madison Concert Orchestra.

2:30 p. m.—Topics for women.

3:30 p. m.—United States Marine Band.

4:30 p. m.—Market quotations.

5:32 p. m.—Market quotations.

5:50 p. m.—Financial summary.

6:15 p. m.—Talk.

6:30 p. m.—New York University course

7 p. m.—Bernhard Levitow's dinner concert.

cert.

8 p. m.—Sundial Serenaders.

8:30 p. m.—Bonnie Laddies.

9 p. m.—Victor hour.

1:30 p. m.—Lorraine Grill Orchestra.

740k—WJY—NEW YORK—405m 7:30 p. m.—Irwin Abrams's Orchestra. 8:30 p. m.—Evelyn Schiff, soprano. 8:45 p. m.—James A. Biggs. flutist. 9:15 p. m.—Samuel Polonsky, violinist.

610k—WEAF—NEW YORK—492m

7.7 a. m.—"Style" talk.
5 p. m.—"Style" talk.
6 p. m.—Columbia University lecture
10 non—Market and weather reports.
10 m.—Abraham Lipschutz, pianist.
10 p. m.—Charles Gordon, barytone.
10 p. m.—Abraham Lipschutz, pianist.
11 p. m.—Talk.
12 p. m.—Talk.

WGBS-NEW YORK-3161

:45 a. m.—Health exercises. :45 a. m.—Prayer service. 0:45 a. m.—Home service talk. 1:05 a. m.—Paul Plaisted, plan

9-11 p. m.—Artists and dance m 12 midnight-1 a. m.—Concert

p. m.—Artists' recital, p. m.-2 a. m.—Artists and orchestra 810k—WEBH—CHICAGO—370m

a. m.-Dance orchestra: new

# Additional Radio Programs for the Week

(Continued from preceding name)
1250k-WHAP-NEW YORK-240m
7 p. m.—Ruth Montgomery, soprano.
7:16 p. m.—Dari Bethmann, barytone.
7:30 p. m.—Kitty Cheatham,
8 p. m.—Phyllis Kraeuter, 'cellist.
8:15 p. m.—News digest.
8:30 p. m.—Women's Chorus.
8:45 p. m.—Cellist; soprano.
9:15 p. m.—The Rev. Joseph McComa speaker. 970k-KDKA-PITTSBURGH-309 p. m.—Dinner music.
p. m.—Farm program.
p. m.—Symphony Orchestra.
m.—Orchestra and quartet. speaker.

9:30 p. m.—Mina Hager, contralto.

9:45 p. m.—Franklin Ford, planist.

10:15 p. m.—Mina Hager, contralto.

10:30 p. m.—Hunorous stories.

10:45 p. m.—Darl Bethmann, barytone. 650k-WCAE-PITTSBURGH-461r 11 p. m .- Program same as WEAF 770k-WTAM-CLEVELAND-461m 1140k—WBPI—NEW YORK—263m a. m.—Happy Hour program. p. m.—Ernie Krickett's Orchestra. 770k-WTAM-CLEVELAND-390m p. m.—Concert orchestra.

10 p. m.—Program same as WEAF.

10 p. m.—Organ solos; artists.

1169h—WADC—AKRON, O.—258m 1430k-WBNY-NEW YORK-210m 6:30 p. m.—Dinner music. 9:30 p. m.—Artists' recital. 10 p. m.—Silvertown Orche 1040k-WLWL-NEW YORK-288m 920k-WSAI-CINCINNATI-326m 9 p. m.—Question Box. 9:15 p. m.—Rhea Leddy, William Flusk, :30 p. m.—Orchestra. p. m.—Studio concert.

duets.
9:30 p.m.—"The Play," R. Dana Skinner.
9:50 p. m.—Plano Recital.
10 p. m.—Rhea Leddy, William Flusk.
10:15 p. m.—"Psychoanalysis," Rev. C.
Bruehl. . m.—Dinner concert.
. m.—International Music Night.
p. m.—Doberty Melody Boys p. m.—Doherty Melody Boys. 920k—WKRC—CINCINNATI—326m 10:35 p. m.—Entertainers 1098k—WBBR—STATEN ISL.—273m midnight—Two-man jazz band. 580k—WCX—DETROIT—517m 8 p. m.—Josephine Locke, violinist. 8:10 p. m.—Elizabeth Paul, soprano. 8:20 p. m.—Bible lecture, J. E. Dawsor 8:45 p. m.—Soprano, violin solos. 9 p. m.—Old-time concert. 580k—WJR—PONTIAC, MICH.—517m 950k-WAHG-RICH. HILL-316m m.—Serenader's and soloists. 350k—WWJ—DETROIT—353m 2:02 noon—Matinee Trio.
p. m.—Joe Zimmerman's Orchestra.
1270k—WBOQ—RICH. HILL—236m. p. m.—Program same as WEAF. 050k—WREO—LANSING, MICH.—286: p. m.—Dinner concert. :15 p. m.—Orchestra, quartet and ar

9.15 p. m.—Joe Zimmerman's Orchestr 10:02 p. m.—Test program: "Germs Night." Night."

740k—WOR—NEWARK—405m

6:45-7:15-7:45 a. m.—Gym class.

2:30 p. m.—Anita Alva, soprano.

2:45 p. m.—The Sealyham."

3 p. m.—Anita Alva, soprano.

3:15 p. m.—Al Wilson's Playmates.

3:30 p. m.—Bessie Robeson, readings:

3:45 p. m.—Al Wilson's Playmates.

6:15 p. m.—Words mispronounced.

6:17 p. m.—"Sports." Bill Wathey.

6:30 p. m.—Jacqueš Jacobs's Ensemble.

7:20 p. m.—News Bulletin.

7:20 p. m.—New's Bulletin.

1190k—WGCP—NEWARK—252m

p. m.—Songs by Elvira Geiger; Os borne & Tucker.

3:30 p. m.—Symphony Orchestra.

1:10 p. m.—Harold Glenn. Joseph Pev ney, Davis & Gallas, Leslie McLeod.

5:10 p. m.—Sylvia Schatz, planist.

3:10-4-5 p. m.—Race resuits.

8:30 p. m.—Strickland's Orchestra.

9 p. m.—Angarolla and Collins, duets.

9:15 p. m.—Bernard Fromensom tenor.

9:30 p. m.—Eva Rothenberg, Judith Roth, Ruby Cowan, songs. 9:30 p. m.—Bernard Tourney, J. 9:30 p. m.—Eva Rothenberg, J. Roth, Ruby Cowan, songs.
10 p. m.—Max Heitt, violinist. 10:15 p. m.—Piotti and Val, songs.
10:30 p. m.—Strickland's Orchestra. 12 (noon)—Luncheon music. 4:45 p. m.—Grand organ; trumpets. 7:30 p. m.—Dinner music.

590k—WIP—PHILADELPHIA—508m 6:45 a. m.—Setting-up exercises. b. m.—Luncheon music. p. m.—Artist recital. 3 p. m.—Artist recital.
6:05 p. m.—Pagoda Orchestra.
7 p. m.—Roll Call; Birthday List.
8 p. m.—"The Sesquicentennial."
8:15 p. m.—Religious services.
10:10 p. m.—A talk.
10:10 p. m.—International Contests; Ben Stad's Symphony Orchestra; addresses. 760k—WLIT—PHILADELPHIA—395m 12:05 p. m.—Organ; religious service. 12:35 p. m.—Ben Franklin Concert

Orchestra.

2 p. m.—Concert orchestra.

4:30 p. m.—Artist recital. —Auto repairs by radio. m.—Dream Daddy. 760k-WFI-PHILADELPHIA-395m n.—Tea Room Ensemble. n.—Philadelphia Mothers' Club. 1080k—WCAU—PHILADELPHIA—278m 6:30 p. m.—Billy Hayes's Orchestra. 7:30 p. m.—Symphony orchestra. 8 p. m.—Mitchell Gondolier. 8:15 p. m.—Eddie Cox's Mask and

Wigers.
8:45 p. m.—The Kandy Kids.
9 p. m.—Barry O'Moore, tenor.
9:30 p. m.—The Musical Chefs.
10 p. m.—Sesquicentennial hour 1000k—WFG=ATLANTIC CITY—300m 1:30 p. m.—Luncheon music. 4:30 p. m.—Tea music. 3:30 p. m.—News flashes.

p. m.—Concert.
m.—Atlantic City Dance Orchestra 2 p. m.—Seaside Trio. 7:30 p. m.—Book Chat. 8 p. m.—Seaside Trio. 10 p. m.—Dance orchestra. 90k-WGY-SCHENECTADY-380m

4:30 p. m.—Charles Goldon, Val. pianist.
4:30 p. m.—Abraham Lipschutz, pianist.
4:45 p. m.—Talk.
6 p. m.—Dinner music.
7 p. m.—Gene Ingraham's Orchestra.
7:30 p. m.—Story teiler.
7:45 p. m.—Bomar, pianist.
8 p. m.—The Happiness Boys.
8:30 p. m.—Eagle Trio.
9 p. m.—Home entertainers.
10 p. m.—Chamber musicale: Gania Zielinska, soprano; Giuseppe de Benedetto, tenor. merce dinner.
10 p. m.—Male quartet; WGY Orchestra.
11 p. m.—Organ recital.
11 p. m.—Organ recital. 1100k-WRW-TARRYTOWN-273m ) a. m.—Timely talks with Terese, 1:10 a. m.—Mary Miller, planiste. 1:20 a. m.—Fashion talk; plano. 0:40 a. m.—Hazel Lee, reading; pla

1100k.—WRW.—TABRYTOWN—273m
9 p. m.—Commodore Barry Boy Scot
Jamboree.
9:30 p. m.—Songs.
10 p. m.—Test program.
10 p. m.—Palace Orchestra.
10:20 p. m.—Dick Tobin, pianist.
10:40 p. m.—Palace Orchestra.
940k.—WGR.—BUFFALO—319m
6:30 n. m.—Dinner music

10:20 a. m.—Fashion talk; piano.
10:40 a. m.—Hazel Lee, reading; piano.
1:30 p. m.—Scripture reading;
1:35 p. m.—Atlas String Trio.
3 p. m.—Interview with Helen Redding;
3:10 p. m.—Chauncey Northern, tenor.
3:20 p. m.—"Book Review"; songs.
3:40 p. m.—Piano Lessons; songs.
4:40 p. m.—Piano Lessons; songs.
5 p. m.—Uncle Geebee.
1:30 p. m.—Jule Anzel's Orchestra.
6 p. m.—"What's Your Radio problem?"
1:10 p. m.—Jule Anzel's Orchestra.
830k—WHN.—NEW WOWN 285 940k—WGR—BUFFALO—319m
6:30 p. m.—Dinner music.
8-8:30 p. m.—The Larkinites.
9-11 p. m.—Program same as WEAF.
6:30k—WTIC—HARTFORD—476m
6:30 p. m.—Chidren's hour.
6:50 p. m.—Dinner concert.
1970k—WNAC—BOSTON—280m
19:15 p. m.—Noon service. 830k-WHN-NEW YORK-361

2:15 p. m.—Hugo Angelo, tenor.
2:30 p. m.—Mugo Angelo, tenor.
2:30 p. m.—Margie Bennett, songs.
2:45 p. m.—Orchestra.
3:45 p. m.—Songs by Jack Valentine,
Herman Streger, Hock and Jerome.
4:30 p. m.—Uncle Robert's Pals.
5 p. m.—Melody Boys.
6 p. m.—Dinner music.
7 p. m.—Harry Richman's Entertainers.
7:30 p. m.—Lew Brown, Sidney Claire,
songs. p. m.—Knickerbocker Trio. p. m.—Alice Baschi, contralto; Vinc 9 p. m.—Alice Baschi, contralto; Vinciliano Trio.

10 p. m.—International Test program, 860k—WEEI—BOSTON—349m

3 p. m.—Lou Klayman's Orchestra.
5:50 p. m.—Lost and found; weather.
6 p. m.—Dok Elisenbourg's Sinfonians.
6:45 p. m.—Big Brother Club,
7:30 p. m.—Musicale.
8-11 p. m.—Program same as WEAF,
900k—WBZ—SPRINGFIELD—333m
6:30 p. m.—Little Symphony Orchestra. p. m.—Larry Herman, Belle Brooks, songs. 3:15 p. m.—Fitzpatrick Brothers, songs. 8:45 p. m.—Wolfe Gilbert, Abel Baer

8:45 p. m.—Wolfe Gilbert, Abel Bad songs. 10 p. m.—Dance orchestra. 10:30 p. m.—Anatol Friedland. 12 midnight.—Silver Silpper Orchestra. 12:30 a. m.—Bob Murphy's Orchestra. 330 p. m.—Little Symphony Orchestra. p. m.—Lenox Ensemble. 330 p. m.—Edwin McEnelly's Orchestra 1160k—WRNY—NEW YORK—258m 2 noon—Paul Hagan, tenor; Ukulek 8 p. m.—Musical program.
9 p. m.—Helen Porter, soprano.
9:30 p. m.—Philip Leveille, violinist.
10:05 p. m.—McEnelly's Orchestra.
1120k\_WTAG—WORCESTER—268n

Bob.

Bob. 10:30 a. m.—Music; talk. 12:05 p. m.—Luncheon music. 4:30 p. m.—Radio entertainment. :15 p. m.—Story teller. :45 p. m.—Nature talk. -11 p. m.—Program same as WEAF. 640k—WRC—WASHINGTON—469p

640k—WRC—WASHINGTON—469m
10 a. m.—Women's hour from WJZ.
12 (noon)—Organ recital.
1 p. m.—Maflower Orchestra.
6 p. m.—Hamilton Orchestra.
7 p. m.—Smithsonian talk.
7:15 p. m.—New Willard Orchestra.
8 p. m.—U. S. Army Band.
9 p. m.—Royal Salon Orchestra.
10 p. m.—The Political Situation Washington. 9 p. m.—Eugene Frey, singer. 9:30 p. m.—Radio Theater Players 11-11:15 p. m.—International test. 11-11:19 p. m.—International test.

110k—WEBJ—NEW YORK—273m
7 p. m.—Kenwood Orchestra.
7:45 p. m.—Sara Turits, soprano.
8 p. m.—Sal Angarola, Ed Collins, du.
8:20 p. m.—Blanche and Hugh Ramss 10 p. m.—'The Political Situation in Washington.
 10:30 p. m.—Meyer Davis's Orchestra. 8:35 p. m.—Leon H. Fox, violinist.

9 p. m.—Hardman Hour of Music. 10 p. m.—Donald Flamm, critic, and Zero. 12:30 a. m.—Jack Denny's Orchestra.

p. m.—Police alarms.
p. m.—Board of Estimate meeting.
p. m.—Idelle Nicosia, soprano.
p. m.—'The Museum, the Factory,
Store and You."
p. m.—Rudolph Joskowitz, violinist.
n.—Theater ensemble

9 p. m.—Theater ensemble.
10:10 p. m.—Emerson's "Social Life and Conduct."
10:30 p. m.—Police alarms; weather.
10:35 p. m.—Fitzpatrick Brothers.
12:50k—WHAP—NEW YORK—240m m.—Dinner music.
m.—Christine Fonteyn, soprano.
p. m.—Professor J. Duncan Spa.
p. m.—Harriet Foster, contraito.
m.—Dorothy Hoyle, violinist.
p. m.—News digest. 30 p. m.—String and wood ensemble. 30 p. m.—Contest between Jeffers and Hamilton. 45 p. m.—WHAP male quartet. 9 p. m.—WHAP listeners' variety hou

10 p. m.—WHAP listeners' variety hour.

1140k—WBPI—NEW YORK—263m

11 a. m.—Happy hour; cooking school.

6 p. m.—Ken Kitchen's Orchestra.

7 p. m.—Warner Theater: M. Turkol,
tenor; Herbert Henderson, organist;
Seymour & Bacine, songs.

8 p. m.—Agnes Trainor, soprano; pianist.

8:45 p. m.—Herman Heller's Orchestra.

9:15 p. m.—Hilda Kay, contraito.

9:30 p. m.—Vincent Cross, pianist.

9:45 p. m.—Hilda Kay, contraito.

10 p. m.—Venetians Society Orchestra.

1430k—WBNY—NEW YORK—210m. p. m.—venetians society Orcnestra. 1430k—WBNY—NEW YORK—210m

30k—WBN x—...
m.—Orchestra.
m.—Marion Thurston, soprano.
p. m.—Viedo Rollisch, violinist.
p. m.—Gypsy String Ensemble. 1100k—WFBH—NEW YORK—273m p. m.—Roehm and Richards En tainers. tainers.

3 p. m.—Roeim and Richards Enterts.

3 p. m.—Hugo Angelo, tenor.

4 p. m.—Hugo Angelo, tenor.

4:15 p. m.—Munzio Arzillo, barytone.

4:30 p. m.—Tea table talk; songs.

5 p. m.—Lou Lockett, violinist.

5:30 p. m.—Warren Peck, barytone.

6:45 p. m.—Murray Schwartz, piano.

6:15 p. m.—Joe Sherman, Jack Neil,

8ongs.

songs. 1:30 p. m.—Majestic String Ensemble. 950k-WAHG-RICHMOND HILL-316m 12:02 Noon—Musical program.

4 P. m.—Joe Zimmerman's Orchestra.
7:30 p. m.—George Getzoff, planist.
7:45 p. m.—Prof. Richard E. Mayne.
9 p. m.—Bob Ward's little Wards.
9:20 p. m.—Brooklyn Automobile Show orchestra. orchestra.

10:02-11:15 p. m.—Test program, 'Frenc Night.'

740k—WOR—NEWARK—405m 8:45-7:15-7:45 a. m.—Gym class 2:30 p. m.—Joseph Reader, planist; Virginia Richards, soprano.
3:30 p. m.—Gertrude White Trio.
3:45 p. m.—"Joyce Kilmer," B. P

dams.

p. m.—Words mispronounced.
p. m.—"Sports." Bill Wathey.
p. m.—Man in the Moon Stories.
p. m.—Jacques Jacobs's Ensemble.
p. m.—News Bulletin.
1190k—WGCP—NEWARK—252m p. m.—Samuel Weber, Sherman Neal, Hugo Angelo, Charol de Thor Marie Kalla. e Kalla.

5 p. m.—Race results.

5 p. m.—Victor Gold's Orchestra.

6 m.—Victor Gold's Orchestra.

7 m.—Clarence Profit, pianist.

7 m.—Pearl Herman, soprano.

n.—Janssen's Orchestra.
p. m.—Perry Bradford's Quartet.
m.—Eddle Geller's Orchestra.
m.—Eddle Geller's Orchestra.
m.—WIIT—PHILADELPHIA—395m 4:30 p. m.—Artist recital. 7:30 p. m.—Dream Daddy. 1 p. m.—Foreign tests.
760k—WFI—PHILADELPHIA—395m

o. m.—Mu Phi Epsilon, honorary mu sical sorority.

30 p. m.—Concert orchestra.

7 p. m.—Dance orchestra.

1080k—WCAU—PHILADELPHIA—278m. 7:30 p. m.—Clarence Seaman's Orchestra, 8:30 p. m.—Singing Groundhog. 8:45 p. m.—American Radio Trio. 9:15 p. m.—Billy's saxophone, 9:30 p. m.—Gardens Orchestra, 10 p. m.—Willie Horowitz, songs, 10:30 p. m.—Jack Myers's musical architects. 50\$k—WOC—PHILADELPHIA—508m

11 a. m.—Grand organ.
12 (noon)—Luncheon music.
4:45 p. m.—Grand organ and trumpets.
7:30 p. m.—Story teller.
7:45 p. m.—Dinner music.
8:15 p. m.—Address.
8:30 p. m.—R. C. O. Band.
9 p. m.—Hohner Harmony Hour.
9:25 p. m.—Theater Orchestra.
10:30 p. m.—Dance music by the Hotel
Ritz-Carlton Orchestra. Ritz-Carlton Orchestra. 590k—WIP—PHILADELPHIA—508m 1 p. m.—Setting-up exercises.
3 p. m.—Luncheon music.
3 p. m.—"Coal Question," Dr. Edward
Mead.
6:05 p. m.—Dinner music.
7 p. m.—Bedtime story.

p. m.—Bedtime story; songs.

1000k—WPG—ATLANTIC GITY—300m

45 p. m.—Organ recital.

p. m.—Dinner music.

p. m.—Educational series.

15 p. m.—Studio program. m.—Concert Orchestra.
m.—Boys' Dance Orchestra.
m.—Test program, Jean organist. 990k—WHAR—ATLANTIC CITY—275m p. m.—Seaside Trio. 30 p. m.—Sport talk, John Budd. p. m.—Seaside Trio. i p. m.—International test; organ

cital. <sup>7</sup>90k—WGY—SCHENE**CTADY—380**r m.—Asia Orchestra.
p. m.—Music; Health Notes.
p. m.—Sunday School lesson

1100k—WKW—TARRYTOWN—273 p. m.—Songa, 30 p. m.—'Fighting Induenza." 45 p. m.—Dez Egan, songa, 1 p. m.—Lyric Orchestra. 120 p. m.—John McGrath, songa, 140 p. m.—Lyric Orchestra. 940k—WGR—BUFFALO—319m 30 p. m.—Dinner music 9 p. m.—Winger's Crescent Entertainers
9:30 p. m.—Recital.
10:30 p. m.—Hewitt humorists.
10:80k—WHAM—ROCHESTER—278m
3:30 p. m.—Eastman Theater Archestra
5 p. m.—Eastman Theater Orchestra.
8:15 p. m.—Comedy from WGY.
9 p. m.—Victor Hour.
10 p. m.—Morality play.
630k—WTIC—HARTFORD—476m
11 a. m.—Talk; plano solos.
11:30 a. m.—Housewives' Forum.
12:05 p. m.—Luncheon music.
6:30 p. m.—Dinner concert. Balley. :15 p. m.—Robert Burns anniversary.

000k-WBZ-SP'GFIELD, MASS.-333m p. m.—Edwin 22.30 p. m.—Concert. 3 p. m.—Victor hour of music. 1120k-WTAG-WORCESTER-268m 0:30 a. m.—Musical selections; talk. 2:05-2 p. m.—Luncheon music. 5 p. m.—Tea dansant music. 7:10 p. m.—Story tellers, 7:45 p. m.—Story tellers, 7:45 p. m.—Mechanics of speech, 8 p. m.—Travel talk, 8:15 p. m.—Concert program, 8:45 p. m.—Current events,

640k-WRC-WASHINGTON-469m a. m.—Women's hour from WJZ.
noon—Organ recital.
p. m.—Meyer Davis's Orchestra.
30 p. m.—United States Marine Ba p. m.—United States
. m.—Lafayette Trio.
5 p. m.—Book talks, Nina Reed. 640k-WCAP-WASHINGTON-469m 45 a. m.—Health exercises. 9 p. m.—Mozart String Quartet; market summeries 1220k-WBAL-BALTIMORE-264m

860k—WEEI—BOSTON—349m p. m.—Health exercises.
p. m.—Joe Herlihy's Collegians
05 p. m.—Lost and found: m.—Lost and found; weather. m.—Joe Rines's Orchestra. m.—Big Brother Club. 6:43 p. m.—Big Brother Club.
7:30 p. m.—Entertainers.
8 p. m.—Sager's hospitality.
8:30 p. m.—Neapolitan Girls' Quintet.
9 p. m.—Musicale.
9 p. m.—Carter's concert.
10 p. m.—Orchestra; Imperial Marimbs

970k—KDKA—PITTSBURGH—309m 6:30 p. m.—Dance music. 8:15 p. m.—University address. 9 p. m.—Concert. ) p. m.—Concert.

650k—WCAE—PITTSBURGH—461m

3:30 p. m.—Dinner concert.

7:30 p. m.—Children's period.

8 p. m.—Chilcott Quartet.

9 p. m.—Studio concert.

1020k;—WAIU—COLUMBUS, 0.—294m p. m.—Musical concert. 770k—WTAM—CLEVELAND—390m p. m.—Dinner music. 770k—WEAR—CLEVELAND—390m m.—Singing Syncopators, m.—Children's hour; talks, m.—Studio concert. —RTL concert. ) p. m.—Singing Syncopators, 1160k—MAOC—AKRON, OHIO—258m 0 p. m.—India Owls. 580—WJR—PONTIAC, MICH.—517m p. m.—Goldkette's Orchestra; soloists. 30 p. m.—Trio concert.

p. m.—Musical program. 050k—WREO—LANSING, MICH.—286m m.—Dinner concert. 850k—WWJ—DETROIT—353m -Dinner concert.
-Orchestra and soloists. m.—Dance music. 580k—WCX—DETROIT—517m . m.—Dance music. 670k—WQJ—CHICAGO—448m o. m.—Orchestra and artists. m.—Ginger Hour. 560k—KYW—CHICAGO—536m m.—Dinner concert. m.—Hour of music. m.—Organ. m.—Organ. a. m.—Insomnia Club. 1130k—WENR—CHICAGO—266m

p. m.—Popular program. a. m.—Westphal's Pioneers. 1330k—WIBO—CHICAGO—226m 7-9 p. m.—Dinner concert. 12:15 a. m.—"Oh, Henry!" Surprise pro gram. 750k—WHT—CHICAGO—400m 45 p. m. (238m)—Alamo Orchestra. 130 p. m.—Soprano and organist. 111 p. m.—Pat Barnes, Al Carney. (midnight)—Music. a. m.—Your Hour League. 1380k—WOK—CHICAGO—217m

selections.
810k—WEBH—CHICAGO—370m
810k—WEBH—CHICAGO—370m 8 p. m.—Orchestra; songs; violinis 10 p. m.—Light opera. 12-2 a. m.—Dance orchestra; songs. 1330k—WBBM—CHICAGO—226p 869k—WLS—CHICAGO—345m 7-12 p. m.—Bell concert; organ; sto Panl Ash's Gang; Ford and Glenn. 670k—WMAQ—CHICAGO—448m

SATURDAY

610k-WEAF-NEW YORK-492m cises," to WEAF, WEEI, WCAP.
7:45 a. m.—Prayer service.
4-5 p. m.—Dance orchestra.
8 p. m.—Dinner music.
7 p. m.—YLesile Arnold.
7:15 p. m.—Paul Jelenek, pianist.
7:30 p. m.—Meetin of the Boreau o Budget; music by the United S.
Army Band; address by President vin Coolidge; General H. M. Lord, National Budget." ises," to WEAF, WEEL WCAT

10-11 p. m.—Ross Gorman's Orchestra.
660k.—WJZ—NEW YORK—455m
12:30 p. m.—Market reports,
1 p. m.—Irwin Abram's Orchestra.
2-4-5:30-10:30 p. m.—News.
2:02 p. m.—Saturday Discussion from National Republican Club.
4:05 p. m.—Alice Frances Harper, soprance. prano. 30 p. m.—Lorraine Grill Orchestra. 8 p. m.—Hamilton's Radio Novel. 8:25 p. m.—Philharmonic Society Studen

Concert. 0:30 p. m.—George Olsen's Dance Orch-950k—WGBS—NEW YORK—316m
0 a. m.—Timely Talks with Teresa.
0:10 a. m.—Kiddie K!ub program.
0:40 a. m.—The Baker Trio.
10:50 a. m.—Fashionable talk.
1:30 p. m.—Scripture reading.
1:35 p. m.—Muriel Anderson, contralto.
1:40 p. m.—Charles Reed, tenor.
2 p. m.—Martin Telcholz, violin.
3 p. m.—Ben Goldman's Entertainers.
6 p. m.—Uncle Beebee.
6:30 p. m.—Ellh Hines' Orchestra.
7:20 p. m.—Film Arts Guild.
7:30 p. m.—Twin Oaks Orchestra.
8:45 p. m.—Dana Baer, musical saw.
8:45 p. m.—Dana Baer, musical saw.
9 pm.—William McGowan, baritone.
9 pm.—William McGowan, baritone.
9:10 p. m.—Angelina Arcella, pianist
9:30 p. m.—Fark Male Quartet.
10 p. m.—Arrowhead Orchestra.
11:15 p. m.—To be announced.
570k—WNYC—NEW YORK—556m 950k-WGBS-NEW YORK-316m 11:15 p. m.—To be announced.
570k.—WNYC.—NEW YORK.—526m
7 p. m.—Altmeister Engel, ballads.
7:30 p. m.—Police alarms.
7:35 p. m.—Recital talk, Herman Neuman.
8 p. m.—Metropolitan Museum of Art
Symphonic Concert.
10 p. m.—Marie Hauth, soprano.
10:10 p. m.—Reading, Harriet Weems.
10:30 p. m.—Police alarms; weather.

tone, 1:30 p.m.—Anita Bröwne's Symposium. 6:55 p.m.—New York Neighborhoods, 7 p.m.—'Whose Birthday To-day?' p. m.—Sports; opera notes.
p. m.—John Martin, fairy tales.
p. m.—Studio concert.

7.30 p. m.—Studio concert.
8.15 p. m.—Siegfried Block, "Personality."
8.30 p. m.—Orlando's Orchestra.
9 p. m.—Norman Secon, planist.
9.30 p. m.—Studio concert.
10 p. m.—Program: Ben Bernie's Orchestra. tra.
1,290k—WOKO—NEW YORK—233m
Stovenson, sobrano

1.290k—WOKO—NEW YORK—253m
8.15 p. m.—Semalina Stevenson, soprano.
8.35 p. m.—Regalbute Sisters, duets.
9.05 p. m.—Vladimir Tobachnik, barytone.
9.20 p. m.—Wary Moody, soprano.
1.100k—WFBH—NEW YORK—273m
2 p. m.—Kismet Dance Orchestra.
3 p. m.—Bert Lowes's Entertainers.
4 p. m.—Billy Burton's Orchestra.
5 p. m.—Doris Fredeman, soprano.
5.15 p. m.—Society Orchestra.
6.15 p. m.—Arifalf Singers.
6.45 p. m.—Ahner Silver, composer.
7.15 p. m.—Investment questions.
7.30 p. m.—Congress Theater.
8.30 k.—WMCA—NEW YORK—341m
6 p. m.—Clott Vali's Ensemble.
6.30 p. m.—Carpiclo Orchestra.
8 p. m.—Current events.
8 p. m.—Current events.
8 p. m.—Robert Campbell, barytone.
12 midnight—Ernie Golden's Orchestra.
1140k—WBPI—NEW YORK—265m

1140k—WBPI—NEW YORK—263m p. m.—Tom Cooper's Orchestra. p. m.—Warner program; Betty Anderp. m.- Cathedral Choral Club.

m.—To be announced.
m.—Hartley Joy Boys. 1430k-WBNY-NEW YOR-210m 1098k-WBBR-STATEN ISL'ND-273m m.—Charles Rohner, violinist.
p. m.—Fred Twaroschik, tenor.
p. m.—"Health and Household."
p. m.—Bible discussion.
p. m.—Charles Rohner, violinist. 50k-WAHG-RICHM'ND HILL-316m

chestra.
1270k—WBQQ—RICHM'ND HILL—236m
9:15 p. m.—106th Infantry Orchestra.
10:02 p., m.—Test program: "Italian 1270k—WBOQ—RICHM'ND HILL—238m
9:15 p. m.—106th Infantry Orchestra.
10:02 p. m.—Test program: "Italian Night."
6:45-7:15-7:45 a. m.—Gym class.
2:30 p. m.—Luncheon National Board of Review of Motion Pictures. Speakers:
Milton Sills and Adolphe Menjou.
3:30 p. m.—Zit's tea music.
6:15 p. m.—Words. mispronounced.
6:17 p. m.—Bill Wathey. "Sports."
6:30 p. m.—Jacques Jacobs Ensemble.
7:30 p. m.—Jacques Jacobs Ensemble.
7:30 p. m.—Magazine review.
8:15 p. m.—Magazine review.
8:15 p. m.—Joseph Barnett, baritone;
William Lockwood, violinist.
8:30 p. m.—Freda Paster, planist. William Lockwood, violinist. :30 p. m.—Freda Paster, planist. :45 p. m.—Daven Orchestra. :15 p. m.—Gil Valeriano, tenor; Loretta

wood. 10:15 p. m.—News bulletin. 10:29 p. m.—Irving Aronson's Crusaders. 1190k—WGCP—NEWARK—252m 1190k—WGCP—NEWARK—252m
3.30 p. m.—Oriole Serenaders.
3.30 p. m.—Craser and Denniker, songs.
4 p. m.—Orichestra.
8.30 p. m.—Strickland's Orchestra.
9 p. m.—Songs.
9.30 p. m.—Ukulele Bob McDonald.
9.45 p. m.—Eanjo and guitar.

10.45 p. m.—Banjo and guitar.

10 p. m.—June Lee, songs.

10 p. m.—June Lee, songs.

10 15 p. m.—Yama Yama Boys.

10 130 p. m.—Strickland's Orchestra.

11 15 p. m.—Ukulele Bob McDonald.

1590k—WOO—PHILLAD ELPHIA—508m.

12 noon—Luncheon music.

1435 p. m.—Grand organ: trumpets.

7:30 p. m.—Grand organ: trumpets.

590k—WIP—PHILAD ELPHIA—508m.

6:455 a. m.—Setting-up exercises. 6:45 a. m.—Setting-up exercises.
10:30 a. m.—Reducing exercises.
1 p. m.—Organ recital.
3 p. m.—Dinner music.
7 p. m.—Dinner music.
7 p. m.—Bedtime story: violin solos.
8 p. m.—Sports corner.
9 p. m.—Operatic program.
9 p. m.—Donath-Mount Trio.
10:05 p. m.—Donate music. 105 p. m.—Dance music. 160k—WLIT—PHILADELPHIA—395F

3 p. m.—Organ recital.
3 p. m.—Mickey Guy's Orchestra.
30 p. m.—Bobby Lee's Cotton Pickers. . m.—Concert Orchestra. —WFI—PHILADELPHIA—395m 760k—WFI—PHILADELPHIA—395m

1 p. m.—Tearoom Ensemble.
3 p. m.—Josh Saddlers Serenaders.
4 p. m.—Ralph Leibowitz, planist.
6:30 p. m.—Concert Orchestra.
7 p. m.—Dance Orchestra.
8 p. m.—Kiwanes Club Quartet.
9:15 p. m.—Metropolitan Life Insurance Company Annual Convention.
11:15 p. m.—International test; trumpet recital, 1000k—WPG—ATLANTIC CITY—300m

1000k—WPG—ATLANTIU UITI—1000 1:30 p. m.—Luncheon music. 6:45 p. m.—Organ recital. 7 p. m.—Dinner music. 8:15 p. m.—Weekly sports lesson. 8:30 p. m.—Swarthmore Musical clubs. 10 p. m.—International test. 10:10 p. m.—Nick Nichols's Dance Orchestra. 11:16 p. m.—Test program; organ recital. 1090k—WHAR—ATLANTIC CITY—275m 2 p. m.—Seaside Trio.
7:30 p. m.—Lecture period.
8 p. m.—Seasids Trio.
11:15 p. m.—International test; Seaside

Orchestra. 799kWGY—SCHENECTADY—389m :30 p. m.—Dinner program. :25 p. m.—Philharmonic Society Stu-

8:25 p. m.—Philharmonic Society Student Symphony.

10:30 p. m.—Dance program.

11:15 p. m.—International radio tests.

1100k—WRW—TARRYTOWN—273m

9 p. m.—Jack Colton, tenor.

9:30 p. m.—Westchester County."

9:45 p. m.—Anthony Tassio, harmonica.

10 p. m.—Murin's Orchestra.

10:20 p. m.—Jack Colton, songs.

10:40 p. m.—Murin's Orchestra.

940k—WGR—BUFFALO—319m

2:30-4:30 p. m.—Buffalo Trades Association concert. ation concert. 1080k—WHAM—ROCHESTER—278m

6:30 to 1:30 p. m.—Dunner concert.
10:30 p. m.—Dance program music.
11:30k—WMAK—BUFFALO—266m
6:15 to 7:15 p. m.—Dinner music.
8-10:30 p. m.—Musical program.
11:15 p. m.—International test.
630k—WTIC—HARTFORD—476m 6:30 p. m.—Skinny's Gang. 6:50 p. m.—Skinny's Gang. 6:50 p. m.—Dinner concert. 8 p. m.—Surday school period. 8:15 p. m.—University Club; Yale Choral

6:45 a. m.—Health exercises.
8 p. m.—Gray Guil Hour.
90k.—WRZ.—SP'GFIELD, MASS.—333m
6:30 p. m.—Little Symphony Orchestra.
6:45 p. m.—Lenox Ensemble.
7:30 p. m.—Organ recital.
8 p. m.—Special feature.
6:40k.—WRC.—WASHINGTON—469m
12 noon—Organ recital 640k—WRU—WASHINGTON—469m 12 noon—Organ recital. 6 p. m.—Lee House Trlo. 7 p. m.—Washington Orchestra. 8 p. m.—Bible talk. 8:30 p. m.—New York Philharmonic So-

ciety. 11:30 p. m.—Theater orchestra. 11 : so p. m.—Interior orenestra,
12 m.—Spanish Village Orchestra,
640k.—WCAP.—WASHINGTON—469m
6:45-7:45 a. m. "Tower Exercises."
8-9:15 p. m.—Bureau of Budget meeting:
addresses by the President, General
H. M. Lord; United States Marine Radio Causes Downfall of 'Yellow Fangs'

Wharton arose and timidly approached

"Mr. Peck, do you care if I take a hand in the hunt?" he asked in a shrinking sort of manner.

Both looked at the boy a moment in bewilderment.

"Bless my soul," laughed the Farm Bureau man, "if it isn't my old friend Roger. Go to it, boy. Pit your wits against old Yellow Fangs. I look for you to give a good account of yourself."

"Do you care if I bring him in alive and exhibit him?" asked the boy. "I want to raise some money for a particular pur-

"You can make a Barnum out of yourself so far as we care," laughed Farmer Peck. "The main thing is to get Yellow Fangs into such a fix that he can't kill any more stock "

Roger Wharton went off in a brown study and was seen no more that day.

"Dreaming as usual," some one remarked. The word of the offered reward soon spread and the strange request of the village dreamer was discussed with many explosions of derision. Squads were organized and set out in many directions. Dreamer Wharton went in the opposite direction from that in which Farmer Peck's calf was killed. He knew the woods for a dozen miles around and he also knew the habits of wolves. The next day he lay on top of a ledge of rocks five miles from home. From his location ha could look down into a deep ravine, at the foot of which seemed to be a den. A leaning tree hung out over this den at an angle of nearly forty-five degrees. All

around were big bowlders and fallen timber. Roger lay there on his stomach until nearly sundown. He was so still that the timid birds and smaller animals played about in fancied security. Once a gray squirrel paused within a yard of his face and stopped to comb his whiskers and preen. He did not let the pranks of the playful woodfolk distract his attention

**Yellow Fangs Appears** 

from the mouth of that den.

Presently a splendid specimen of timber wolf, rolling fat and with shining, tawny coat, cautiously poked his nose out at the den and sniffed. Roger had observed long before that a light breeze was blowing up the ravine by the den and going on up over the bluff where he was secreted. He could feel that soothing breeze on his brow as he lay with the stillness of the stones about him. When he first lay down he moistened his finger in his mouth and held it up. The moisture on the side next to the ravine disappeared first. That told him that the breeze was coming from the direction of the den and would carry no scent of human being to that inquisitive nose.

After thoroughly satisfying himself that no danger was near, Yellow Fangs, so recognized in an instant by the watchful boy, came further out and squatted on a little earthen platform in front of his home. The wolf vawned and then licked his chops in anticipation of the feast that was in store for him that night. As Roger lay there he observed that a leaning tree, firmly rooted in the top of the bank near him, hung out far beyond the mouth of the den where Yellow Fangs sat in apparent security.

When Roger had absorbed the whole situation he crawled backward out of sight and hearing of the sharp-eyed and keen-eared creature whose haunts he had been spying upon. That night he had a long and earnest conference with his chum. "Fatty" Mosier.

Early the next morning they stole out of Hopedale loaded down with bundles and equipment for their purposes. Long before noon they had reached that high cliff and were looking down at the front door of the home of Yellow Fangs. He was nowhere in sight. After a strenuous night he would sleep late, far back in his cavern home, filled to a glutton's repletion with the best of the land.

With this knowledge of the habits of wolves. Roger carefully extracted a roll of light wire from among the packages and slowly crawled out on the leaning tree to a point beyond the mouth of the cave. There he wrapped the end of the wire around the trunk of the tree twice and twisted the end around the wire in such a way as to fasten it there. Then he went back to his partner in the undertaking and they fastened the wire which had been left in the hands of "Fatty" to a portable

(Continued from page one)

quite a long piece of wire dangling below | ture Yellow Fangs and win the hundred where the radio receiver was fastened to dollars reward. serve as a ground wire. When that was

completed a loud speaker was attached. Before leaving Hopedale Roger had arranged with a cornet player of the local band to get out on the green and toot softly a half dozen times, at intervals of fifteen minutes for an hour at about 10 a. m. In no event was he to blow a shrill

blast. When those light toots came Roger tuned in and got the right dial setting. Then the radio was lowered over the cliff by means of a light cord attached to it, the wire attached to the tree acting as a support. When it came to rest like the pendulum of a stopped clock the radio hung suspended in the air about twenty feet in front of the mouth of the den. The dangling wire below the instrument made a good ground and the wire at-

tached to the tree above made a satisfactory aerial In their equipment the boys had a long, light rope with a slip-noose in the end of it. For two yards or more above the noose the rope was wrapped with fine wire. By

The Cornet Player's Part

Arrangements had been made with the horn blower in Hopedale to get out on the village green at precisely 1 o'clock and blow until his eyes popped out and hold high and shrill notes as long as his breath lasted. Roger had a watch that his Uncle Henry had given him as a Christmas gift the year before. He now began pulling it out every few minutes and consulting it. At five minutes to 1 the stage was all set. The boys were aquiver with excitement. They had crept to the edge of the cliff where they could see Yellow Fangs's front door. Roger had the noosed rope in his

Just on the minutes sharp notes smote the air. The boys themselves were almost frightened at their distinctness. It sounded exactly like a cornet cutting up seemed weird. The boys peered over and waited. For several minutes there was were watching with straining eyes. The

noon all the plans had been laid to caphorn tooted and tooted. Its shrillness set

apartment.

Data on a Simple Two Control Receiver

(Continued from page three)

should be drilled separately and put to-, the coils and condensers seems to be a gether after each has had its respective instruments mounted. This is more sensible than the usual system of fastening the subpanel first and mounting the parts

In the extreme right and left hand back orners of the subpanel two additional holes are drilled to pass small 6-32 machine screws. The latter are screwed into short section of round brass rod. 21/2 inches long, which act as supporting feet

for the receiver.

In the photograph of the inside of the set only five short wires are visible and the outfit looks as if it has not been completely connected. It really has been. though; no wires are in sight because they have all been dropped through holes in the ed on its neatness and businesslike air. No; the writer himself did not construct the outfit; Walter J. McCord, an old-time radio operator and master naval radio expert, constructed it for him at his laboracory at 57 Dey Street, Manhattan.

The circuit employed in this two-dial set is a more or less familiar and entirely dependable one. The hook-up is shown in detail and will give no trouble.

How It Operates

The single condenser on the left tunes the left-hand Lemnis-Goil, while the double one tunes the second and third ones, representing the second R. F. and detector stages at once. The coils are respectively designated in the diagram as L1, L2 and L3. The rotary plates of the double Amsco condenser are c ommon and are connected by one wire to the filament circuit; the stationary plates are separated, one section, S1, going to the second ube: the other. S2. to the third

The ten-ohm rheostat, R1, controls the two R. F. bulbs, the 15-ohm one, R2, the detector alone. R3 and R4 are both No. 112 amperites; R5, R6 and R7 are all 100,000 ohms apiece, while resistance L is 500,000 ohms. The audio amplifier system is simple; A. F. T. represents the audio transformer, while condenser C1 and resistances R5 and L constitute one resisto-coupler unit, and C, R6 and R7 the

The first five tubes are UX- or CX-201A's, the last a UX-112 power tube. The latter is quite necessary, as a UX-201A cannot handle the output of the preceding five tubes without overloading and causing distortion. The power tube fits in conveniently, as it works on the same 135-volt B battery used with the resistance amplifier stages. The nine-volt C battery must not be overlooked

No neutralizing measures were found necessary in this set, for the simple reason that the particular radio-frequency transformers used did not require any. The Lemnis coils, wound in hour-glass shape and consisting of fifteen-turn primaries and 103-turn secondaries, seem to possess completely confined magnetic fields and give no trouble with oscillation.

The double condenser scheme works out beautifully. It was feared that an additional small vernier condenser would be necessary to bring all three R. F. stages

fortunate one; they tune together without trouble. The quality of reproduction, thanks to the heavy, low ratio transformer and the two stages of faultless resistance coupled amplification, is perfect with a cone loud speaker. The volume of the local station is a little too great for comfort in an

Data on the Improved Roberts Circuit

(Continued from page four)

giving undistorted signals over a very wide audio band should be used. Due to the very high signal strength some transformers tend to set up a high frequency squeal. If this occurs a fixed condenser having a capacity not greater than .0001 mfds. may be shunted across the plate and grid of one of the last two audio tubes. The position of this condenser is indicated by dotted lines in the diagram. The rest of the circuit is simple. The only points to be observed are that the two tuning coils are mounted in the same plane at least six inches apart, and that the grid and plate leads are not run close together.

After the wiring is completed the set must be neutralized to prevent oscillation in the radio frequency tube. To do this tune in a strong signal at about the center of the dials, then turn out the R. F. tube by adjusting the rheostat. Now vary the midget condenser until the signal entirely disappears or becomes very weak. Now relight the R. F. tube and retune the set until the signal is at maximum, then the midget condenser until the signal is at of commission. a minimum. This process should be gone through very carefully until absolute neumay be sure that your set cannot annoy the neighbors by radiation or break into uncontrollable squels while tuning. Of course, an adjustment of the tickler coil while tuning will produce a regenerative squeal, but this does not couse radiation aand is really only necessary on very weak or distant stations.

There are a few points that have been found important, the first and most important of which is the type of apparatus used. The Roberts five-tube set is a very sensitive receiver with a very great amplification of signal strength, and the apparatus must be such as to handle the signals without distortion. Pick only the very best parts and test every one of them for short circuits before mounting them in the set. If this advice is followed the set should last for years without trouble of any kind. Next, don't run grid and plate wires close together. This produces "wired-in capacity" and prevents neutralization. If it is found impossible to so neutralize the set that movements of the R. F. tuning condensers will not throw it into oscilation, check up on the grid and plate leads. Use a C battery. Voltage equal to 10 per cent of the B battery used is about correct. This gives greater purity radio set which "Fatty" owned. They left | into resonance, but the combination of | of reproduction and saves your B battery. | lars.

all the woodfolk afflutter. Crown flew overhead and cawed their disapproval; jays soaring above on restless wing scolded hoarsely and the ground denizens took it out in fussy demonstrations, but no Yellow

Fangs appeared. Presently, however, an investigating nose was thrust out. Curiosity had done its work. Yellow Fangs wanted to know what was going on outside. His nose searched in all directions for the scent that he shunned. He could find nothing. Roger had seen to that. His foot had not touched soil near the den, and the wind

was still drawing up the ravine. Then a cautious forefoot came out, soon followed by another. Then the shoulders, After a wait of a few seconds the wily night raider walked out on the earthen platform in front of his door and squatted on his haunches and looked straight at the noisy thing suspended in the air in front of him. It was plain that the shrill sounds hurt his ears. He kept shaking his jack right down in the ravine. It really | head from side to side and then pawing at his ears. Presently a blast shriller and more penetrating than the others filled not the least stir at the front door they | the ravine to overflowing. At that Yellow Fangs threw all caution to the winds,

thrust his nose into the air, closed his eyes and howled and howled and howled. At the beginning of the first howl Roger dropped the noose of the rope he held in his hands and which had been knotted to a sapling in the lear to within a foot of that upturned nose. Then he eased it down softly until it dropped over that tawny head and settled around the sleek neck. A quick jerk and the noose tightened. Yellow Fangs sprang out into space. The boys above hauled with all

their might and speed. The next moment Yellow Fangs was helplessly dangling in the air and choking to death. The boys knew too much about wolves to haul him up just then. They must wait until the brute was near enough dead to be helpless and harmless. When at last he hung limp and ceased to struggle he was quickly pulled up and the noose loosened about his neck. He had made great efforts to bite the rope in two. but had failed because of the fine wire with which it was wrapped.

Hastily they clapped a wire muzzle over his mouth and bound it fast back of the ears. Then the forelegs were lashed together, and the hind legs treated the same. All this time Yellow Fangs lay there like dead. Presently, as the boys watched and waited, his flanks began to heave and in ten minutes he was as much alive as ever, but hopelessly bound.

When the boys had pulled the radio back up by means of the cord attached to it, had loosened its wire support and left that dangling from the leaning tree and packed their belongings, the boy with the horn signed off with: "If you fellows have not done your work yet you will have to excuse me. My lips are busted."

Then he jumped down from the village sending station and went off on a hunt for a bottle of vaseline.

Yellow Fangs made brave efforts to break loose and escape, but he was bound so securely that he could not get his again turn out the R. F. tube and readjust | muscles in action and his mouth was out

When the gleeful boys were ready they thrust a light pole between the bound tralization is obtained, after which you front and hind legs of the fallen woods ranger and carried him into the village with all the indignity of a trussed-up fowl. He was dropped on the village green for public inspection, while the tired boys sat on the eige of the speaker's platform and took long, invigorating breaths.

Of course they were heroes and all that sort of thing. When the Farm Bureau man came around with the reward the boys thanked him as they first handed the cracked-lipped horn blower a ten spot and divided the rest between themselves.

"Now, Mr. Whitely," said Roger, "can't we keep Yellow Fangs a while and exhibit him in our barn at 10 cents a peep? We want to make a little more money."

"Go to it, boys," laughed Whitely, slapoing Roger on the back, "but be sure you keep him muzzled and hobbled."

"Trust us for that." Roger chuckled. "We captured him and we ought to be able to keep him a prisoner." "What do you want with more money?" bristled Farmer Hiram Peck, who wanted

to get a gun and kill the beast. "We want to buy two of the best radio receiving sets in the county," was the

They did and then sold the wolf to a traveling show for another hundred dol-

# The Herald Tribune Daily Broadcasting Programs for Week Ending January 30

#### TO-DAY

- 610k-WEAF-NEW YORK-492m 6-10k—WEAF—NEW YORK—492m
  2-3 p. m.—Sunday radio service; address
  by the Rev. Dr. Henry Howard; singers.
  8-4 p. m.—Young People's Conference; address by Dr. Daniel A. Poling.
  4-5:30 p. m.—Men's Conference at the
  Y. M. C. A.; address by Dr. S. Parkes
  Cadman; Glorla Trumpeters.
  7:20-9:15 p. m.—"Capitol Theater Famity" 9:15-10:15 p. m.—"Atwater Kent Hour;" New York Symphony Orchestra.
- 660k—WJ95s—NEW YORK—155m

  a. m.—Children's nour.

  11 a. m.—St. Thomas's Church services.

  2:30 p. m.—Sunday radio forum; Dixie
  Jubilee Singers.

  8:30 p. m.—Greystone Trio.

  8:55 p. m.—Vesper services; St. George's
  Church.
- Church. 5.45 p. m.—"The Threshold of To-morrow," Edgar Burrill. row," Edgar Burrill,
  7 p. m.—"The Search for Self," Dr. Ralph
  Sockman.
  7:15 p. m.—Nathan Abas' Concert Orches-8 p. m.—J. Morton Smith, barytone. 8:15 p. m.—Joseph Knecht's Concer
- 8:15 p. m.—Joseph Knecht's Concert (chestra, chestra, che
- 950k-WGBS-NEW YORK-316m 830k—WHN—NEW YORK—361m 11:30-12:30 p. m.—Calvary morning s
- ice.
  12:30 p. m.—Organ recital.
  2-3 p. m.—Queens Endeavor program.
  8-4:30 p. m.—Radio Bible Class.
  5 p. m.—Dance orchestra.
  7:30-9:45 p. m.—Calvary evening servic
  10 p. m.—Anatol Friedland.
  10:30 p. m.—Janssen's Orchestra.
  12 midnight—Harry Richman's Ent
- 880k-WMCA-NEW YORK-341m
- 860K—WMLA—NEW IUMA—STIM
  a. m.—Services.
  0 p. m.—Lou Gold's Orchestra.
  1 m.—Roemer's Homers.
  1 m.—Ernie Golden's Orchestra.
  2 p. m.—Olcott Vail's String Ensemble
  3 m.—Hugo Zeller, "Lacquer."
  3 p. m.—Near East Relief musical program. 9:30 p. m.—Donald Flamm's Frolickers.
- 1250k—WHAP—NEW YORK—240m. 2:30 p. m.—Concert of sacred music, ch and soloists. 8:30 p. m.—Mary Pinney, organist. 570k—Mary Pinney, organist.

  570k—WNYC—NEW YORK—526m

  10:30 a. m.—Supreme Anchor Club Communion Breakfast. Speakers: Joseph V. McKee, William Collins, Edward Kenney, Walter Lynch and the Rev. Father Daniel Kenyon.
- 1100k—WFBH—NEW YORK—273m

  5 p. m.—Artillery Band.
  6 p. m.—Talk.
  6:10 p. m.—Masonic news.
  6:30 p. m.—Franklin Four.
  7 p. m.—Majestic String Ensemble.
  10-11 p. m.—Harlem Old-Time Banquet.
- 1160k—WRNY—NEW YORK—258m 2:45 p. m.—"Body Fit" talks. 3 p. m.—Carl Bemies, "Music of All F ligions" ilgions."

  4 p. m.—Or. Christian Reisner's hour.

  5 p. m.—St. Thomas's Choir.

  8:15 p. m.—Charles Isaacson's Concert. p. m.—Paulist Choristers; sermon Rev. John C. Smith.
- 1430k—WBNY—NEW YORK—210m 2:30-4 p. m.—Musical program. 1270c—WBOQ—RICHMOND HILL—236m 10:02 p. m.—Test Program; Alfred Wer theim, violinist; mixed quartet. 1098k—WBBR—STATEN ISLAND—273m
- 10 a. m.—Instrumental trio.
  10 15 a. m.—Sunday school lesson.
  10:15 a. m.—Sunday school lesson.
  11 a. m.—Bible lecture, R. H. Barber.
  11:30 a. m.—Choral singers; trio.
  2 p. m.—Watchtower Orchestra.
  2:30 p. m.—L. Marlon Brown, soprano.
  3 p. m.—Bible lecture, R. H. Barber.
  3:30 p. m.—Songano orchestra. 3:30 p. m.—Soprano, orchestra solos.
  9 p. m.—Violin choir.
  9:15 p. m.—Bible questions and answers.
  10 p. m.—Violin choir.
- 1190k-WGCP-NEWARK-252m 1190k—WGCP—NEWARK—252m 7 p. m.—Dulcimerians. 7:35 p. m.—Milton Yokeman, tenor. 7:45 p. m.—Isabelle Henderson, sopral 8 p. m.—William C. Ihiefeld, baryton 8:15 p. m.—Bernard Slare, violinist. 8:30 p. m.—Landino's Entertainers. 9 p. m.—Strickland's Orchestra.
- 590k—WOO—PHILADELPHIA—508m
- 590k—WIP—PHILADELPHIA—508m 10:45 a. m.—Morning Services. p. m.—Religious talk. 760k—WLIT—PHILADELPHIA—395m
- m.—Concert orchestra.
  p. m.—Organ recital.
  m.—Concert orchestra. 7 p. m.—Concert of music. 8:15 p. m.—Chamber music. 760k—WFI.—PHII.ADELPHIA—395m ——Sarvices.
- 10:20 a. m.—Services. 4:30 p. m.—Services. 10 p. m.—Male Quartette; Harmony Trum-peters; Ensemble. 1080k—WCAU—PHILADELPHIA—278
- 5 p. m.—Recital: Radio Church Service Rev. J. W. Stockwell. 6:45 p. m.—Clarence Seaman's Orchestra. 7:45 p. m.—Concert orchestra. 8:30 p. m.—Light Opera Company. 9 p. m.—Potash and Perlmutter.
- 1000k-WPG-ATLANTIC CITY-300m 9 p. m.—News Flashes. 9:15 p. m.—Concert orchestra. 10 p. m.—Organ recital.
- 1090k—WHAR—ATLANTIC CITY—275m 10:45 a. m.—Morning service
- 1100k—WRW—TARRYTOWN—273m 8 p. m.—Nicholas Koenig's Orchestra. 10-11 p. m.—Broadcast Test; orchestra s
- 790k-WGY-SCHENECTADY-380m 11 a. m.—Service.

  3 p. m.—Musical program

  5 p. m.—Organ recital.

  7:30 p. m.—First Presbyterian Church.

  9 p. m.—WJZ studio program.

  10 p. m.—Godfrey Ludlow, violinist.
- 940k—WGR—BUFFALO—319m 10:45 a. m.—Morning service. 7:45 p. m.—Evening service. 9:15-10:15 p. m.—Program same as WEAF.
- 1080k—WHAM—ROCHESTER—278m 3:15 p. m.—Radio Chapel services, 1130k—WMAK—BUFFALO—266m 10:25 a. m.—Morning service. 7:30 p. m.—Evening services.
- 630k—WTIC—HAETFORD—176m

  5 p. m.—Organ recital. Professor I

  B. Jepson.

  9 p. m.—Sacred Concert.

  860k—WEEL—BOSTON—349m
- 860k—WEEL—BOSTON—349m
  10:50 a. m.—Morning service.
  2 p m.—Golden Rule hour.
  3 p. m.—Organ recital.
  4 p. m.—Dr. S. Parkas Cadman.
  6:20 p. m.—Musicale.
  7:20 p. m.—Capitol Theater Family.
  10:50 a. m.—Morning service.
  1:30 p. m.—Concert.
  0:15 p. m.—Old South Forum; Jane Addams, "Is the World Growing Better?"

- 6:15 p. m.-Carillon concert: evening service.
  900k—WBZ—SPRINGFIELD, MASS—333m
  10:50 a. m.—Church services.
  7 p. m.—Dinner concert. 7 p. m.—Dinfer concert
   7:30 p. m.—Musical program
   8 p. m.—Ford Hall Forum, Louis Wolsey p. m.—Ford Hall Forum, Louis wolse 1120k—WTAG—WORCESTER—268m p. m.—Men's Conference. 20 p. m.—Capitol Theater Family. 15 p. m.—Program same as WEAF.
- 640k-WCAP-WASHINGTON-469m 12mOk-WBAL-BALTIMORE-246n 970k-KDKA-PITTSBURGH-309m
- m. Organ recital 650k-WCAE-PITTSBURGH-461n m - Capitol Theater Family
- 160-WADC-AKRON, OHIO-258m 776-WEAR-CLEVELAND-390n m.—Theater orchestre p. m.—Fireside Hour. p. m.—Organ recital. 9:15 p. m.—Program from WEAF. 10:15 p. m.—Talk on Esperanto.
- 710k-WLW-CINCINNATI-422m 8:30 p. m.—Service. 9:30 p. m.—Concert orchestra. 920k-WSAI-CINCINNATI-326m 920k-WKRC-CINCINNATI-326m
- 850k-WWJ-DETROIT-352m 1050k—WREO—LANSING—286m m.—Church services, 560k-KYW-CHICAGO-536m p. m.—Club services, ):30 p. m.—Classical concert.
- 870k—WLS—CHICAGO—345m 7:30 p. m.—Little Brown Church, 750k-WHT-CHICAGO-400m 30 p. m.—Tabernacle band and choir. 30 p. m.—Request program. 1380k-WOK-CHICAGO-217m n.—Pacific Coast progra
- 1130k-WENR-CHICAGO-266m 1330k—WIBO—CHICAGO—226m 1330k-WBBM-CHICAGO-226m
- p. m.—Quartet; trio and orchestra, a. m.—Nutty Club; orchestra. 810k-WEBH-CHICAGO-370m 6 p. m.—Twilight musicals. 8-10 p. m.—Selected artists' program. 870k-WCBD-ZION CITY-345m
- 620k-WOC-DAVENPORT-484m 7:30 p. m.—Church services. 9:15 p. m.—Program from WEAF. 12 p. m.—Symphony orchestra. 620k-WSUI-IOWA CITY-484r 20k—WHB—KANSAS CITY—366m p. m.—Evening service. 15 a. m.—Theater organ concert.
- 550k-KSD-ST. LOUIS-545m 15 p. m.—Concert orchestra. 15 p. m.—Program from WEAF. 800k-KTHS-HOT SPRINGS-375m p. m.—Classical music midnight—Musical Train Crew; orga

MONDAY

4:30 p. m.—Trio concert.
5:32 p. m.—Market quotations.
5:50 p. m.—Financial summary.
6:15 p. m.—Department of Agriculture.
6:30 p. m.—Dew York University course.
7 p. m.—Bernhard Levitow's concert.
7:55 p. m.—'Is Woman Boss?" John Ke nedy.
8 p. m.—Elva Boyden, contraite.
8:15 p. m.—Wanda Norman, planist.
8:30 p. m.—Bernardo DeMurco, tenor.
9 p. m.—Henry Hadley's Orchestra.
10 p. m.—Concert Quartet.
10:30 p. m.—Harry Leonard's Orchestra.
610k.—WEAF—NEW YORK—492m.

610k—WEAF—NEW YORK—492m 6:45 a. m.—Health exercises. 7:45 a. m.—Prayer service. 10:45 a. m.—Home service talk.

p. m.—University lecture, 'Earth's Su face."
:20 p. m.—Adolphe Opfinger, pianist.
:80 p. m.—Lullaby Lady.

7:30 p. m.—Lunavy Lady.

8 p. m.—"Pop" concert.

8:30 p. m.—Coal Miner's Trio.

8:45 p. m.—Health talk.

9 p. 2m.—Music by Gypsies.

10 p. m.—Grand opera, "Martha."

950k—WGBS—NEW YORK—316m

950k—WGBS—NEW YORK—316m
10 a. m.—Timely Talks with Terese.
10:10 a. m.—Bernard Kalkin, organist.
10:20 a. m.—Eashion talk; organ.
10:40 a. m.—Dorothy Herzig.
1:30 p. m.—Deborah Greenburg, soprano.
1:40 p. m.—Samuel Kurland, violinist.
3 p. m.—Interview With Gladys Calthrop.
3:10 p. m.—Rosalie Blanchard, Walter
Croft duets.
3:40 p. m.—League of Women Voters.
3:50 p. m.—Duets.
6 p. m.—Uuncte Geebee.

3:50 p. m.—Duets.

8 p. m.—Uuncle Geebee.

6:30 p. m.—Dance Orchestra.

7 p. m.—American Bankers' Association

7:10 p. m.—Premier Dance Orchestra.

7:20 p. m.—Tommy Tucker, tenor.

880k—WMCA—NEW YORK—341m p. m.—Olcott Vail Ensemble, 320 p. m.—Ernie Golden Orchestra, 330 p. m.—Kurtz Karnival Kinga, 3 v. m.—Terminal musical hour.

p. m.—Terminal musical hour.
p. m.—Lecture on Christian Science.
0:45 p. m.—Barclay radio program.
midnight—Jack Denny's Orchestra.

570k-WNYC-NEW YORK-526m

8:15 p. m.—Scotch Ballads.
8:15 p. m.—Hobert Burns," W. Sloan.
8:35 p. m.—Dorlanne Bawn, soprano;
James McDade, barytone.
9-10 p. m.—International Test. Greetings
by Mayor James J. Walker; songs.
10 p. m.—Richmond Versatile Orchestra.
10:30 p. m.—Police Alarms; weather.

:10 p. m.—Market high spots. :20 p. m.—Piano selections 6:10 p. m.—Market high spots.
6:20 p. m.—Plano selections.
6:30 p. m.—Elementary German Lessons.
7 p. m.—Advanced German Lessons.
7:30 p. m.—Police alarms.
7:35 p. m.—Popular songs.
7:46 p. m.—"Museum Collections." I

8:05 p. m.—Scotch Ballads. 8:15 p. m.—"Robert Burns," 8:35 p. m.—Dorianne

p. m.-Dinner music.

- WAHG-RICHMOND HILL—316m
  12:02 (noon)—Grebe Matinee Trio.
  4 p. m.—Joe Zimmerman's Orchestra.
  7:30 p. m.—Maude Mason, planist.
  7:45 p. m.—Martha Brauninger, sopranc 660k-WJZ-NEW YORK-455m 10:10 p. m.—Topics for women.
  12:30 p. m.—Market reports.
  1 p. m.—Meyer Davis' Orchestra.
  2, 4:30, 5:30, 7:30, 11 p. m.—News.
  2:02 p. m.—Madison Concert rehestra.
  2:30 p. m.—Topics for women.
  3:30 p. m.—Topics for women.
  3:30 p. m.—Trio concert.
  3:30 p. m.—Trio concert.
  - 8 p. m.—Synchrophase Trio.
    9 p. m.—"Scouting for Girls."
    9:20 p. m.—Joe Zimmerman's Orchestrs
    10:02 p. m.—Test program: Walter Les
    barytone; others.
    12 p. m.—Joe Zimmerman's Orchestra.
  - 12 p. m.—Joe Zimmerman's Orchestra.

    740k—WOR—NEWARK—405m
    6:45-7:15-7:45 a. m.—Gym class.
    2:30 p. m.—Oreste's Queensland Orchest
    3:15 p. m.—Gertrude White, soprano.
    3:30 p. m.—Talk on fashions.
    3:45 p. m.—Gertrude White, soprano.
    6:15 p. m.—Words mispronounced.
    6:17 p. m.—Bill Wathey, "Sports."
    6:30 p. m.—Jacques Jacobs's Ensemble.
    7:30 p. m.—George Tcherban's Orchestrs
    8 p. m.—"Current Topics" lecture, H.
    Kaltenborn.
  - Kaltenborn.
    330 p. m.—"Al Reid's Hour."
    350 p. m.—"Al Reid's Hour." 9:30 p. m.—Jersey City Automobile Shoropening: Mayor Frank Hague, Governo A. Harry Moore, Arnold Rippe.
    10:15 p. m.—Balaiaka Band.
    10:30 p. m.—Maxine Brown.
    10:45 p. m.—Balalaika Band.
    10:55 p. m.—News bulletin.
  - 1190k—WGCP—NEWARK—252m
    3 p. m.—Songs.
    3:30 p. m.—Symphony Orchestra.
    4:10 p. m.—Elly Ronan, soprano.
    4:30 p. m.—Uncle Robert's Pals.
    5:10 p. m.—Uncle Robert's Pals.
    5:10 p. m.—Bernard Pollack, Lew Dorn.
    3:10-4-5 p. m.—Race results.
    8:30 p. m.—Harold Loomis Orchestra.
    9: p. m.—Talk to boys. Philip Wolf.
    9:10 p. m.—Trio concert.
    9:30 p. m.—Celtic Concert Group.
    10:30 p. m.—Strickland's Orchestra.
    5:90k—WOO—PHILADRLPHIA—508m
    11 a. m.—Grand organ. 1190k-WGCP-NEWARK-252m
  - 11 a. m.—Grand organ. 12 noon—Luncheon music. 4:45 p. m.—Grand organ; trumpets. 7:30 p. m.—Dinner music. p. m.—Dinner music.
    p. m.—Pop" concert.
    p. m.—Music by Gypsies. p. m.—Grand opera, "Martha." 500k—WIP—PHILADELPHIA—508n
  - 45 a. m.—Setting-up exercises, p. m.—Violin recital. 45 p. m.—"Irritability." p. m.—Market hints. 4 p. m.—Market hints.
    5:05 p. m.—Dinner mustc.
    7 p. m.—Roll call; dancing lesson.
    760k—WIIT—PHILADELPHIA—395m
    12:05 p. m.—Organ; religious service.
    12:35 p. m.—Concert orchestra.
    2 p. m.—Concert orchestra.
    4:30 p. m.—Talks; recital.
    7:30 p. m.—Dream Daddy.
    8 p. m.—Short Agro-Wayas
  - 8 p. m.—Short Agro-Waves.
    8:15 p. m.—Artist recital.
    9 p. m.—Stanley Theater Hour.
    10 p. m.—Dance orchestra.
    10:30 p. m.—Vaudeville.
    760k—WFI—PHILADELPHIA.—395m 760k—WFI—PHILADELPHIA—395m

    1 p. m.—Tea Room Ensemble.

    3 p. m.—Thysiology of Animal Care.

    3:10 p. m.—Schubert String Quartette.

    4 p. m.—Owen P. Porter, soprano.

    6:30 p. m.—Concert erchestra.

    7 p. m.—Dance orchestra.

    1080k—WCAU—PHILADELPHIA—275m

    8 p. m.—Telk on Radio Telephony.

    8:15 p. m.—Carolyn Thomas, soprano.

    8:45 p. m.—American Radio Trie.

    9:10 p. m.—Nokol concert.

    9:30 p. m.—Broadway stars. 10 p. m.—Kathryn Fichians. 10:30 p. m.—The Parodians. 1000k.—WPG ATLANTIC CITY—300m 30 p. m.—Tea music.
    30 p. m.—News flashes.
    45 p. m.—Organ recital.
    45 p. m.—Dinner music.
    46 p. m.—Children's Hour.

8 :30 p. m.—Talka 9 p. m.—Concert orchestra 10 p. m.—Test program. French music. 10:15 p. m.—Qalen Hall Trio.

1140k-WBPI-NEW YORK-263m 1090k-WHAR-ATLANTIC CITY-275m 790k—WGY—SCHENECTADY—380m p. m.—Asia Orchestra. 30 p. m.—Music; household talks, cool

p. m.—Concert.
p. m.—Madeleine Mooney's friends.

1080k-WHAM-ROCHESTER-278m

1080K—WHAM—WULLED I MAY-200M :30 p. m.—Eastman Theater orchestra p. m.—Theater organ. p. m.—Theater orchestra. :30 p. m.—Weather; market report.

WHAZ-TROY, N. Y.—380m to 11 p. m.—International pro students orchestra; Campus Serei

a. m.—Talk; music.

30 a. m.—Housewives' Forum.

05 p. m.—Luncheon music.

30 p. m.—Children's entertainer.

p. m.—Popular period. 30 p. m.—Dance music; concert.

30 a. m.—Club talks; news. 15 p. m.—Organ recital.

1070k-WNAC-BOSTON-280m

2:15 p. m.—Organ recital,
p. m.—Luncheon concert,
p. m.—Cupiev Plaza Trio,
p. m.—Kiddies Klub,
.80 p. m.—Dinner dance,
.30 p. m.—English Chemist Shop,
.40 p. m.—Organ recital; address,
.55 p. m.—Metropolitan Grand Orchest
.45 p. m.—Ray Stewartson's Orchest
vocal solids.

Scok-WEEI-BOSTON-349m

5 p. m.—Big Brother Club.

Moral Brother Club.

p. m.—Musicale. m.—E. B. Rideout, meterologist.

:15 p. m.—Musicale. :45 p. m.—Program same as WEAF. 0 p. m.—Scotty Holmes's Orchestra. 900k—WBZ—SPBINGF D. MASS.—Sam

wren. 9 p. m.—Aleppo Drum Corps. 9:30 p. m.—Instrumental Trio. 10:05 p. m.—Leo Reisman's Orchestra.

1120k—WTAG—WORCESTER—268m 0.30 a. m.—Musical selections; talk. 2. noon—Market and weather report. 2.05-2 p. m.—Luncheon music. p. m.—Science talk; Twilight Scouts. p. m.—'Pedigree Breeding,' W. C. Mon

640k—WRC—WASHINGTON—469m a. m.—Women's hour from WJZ.

640k—WCAP—WASHINGTON—469m 45-7:45 a. m.—Health exercises. 7 p. m.—Washington Post Hour."

1220k-WBAL-BALTIMORE-246m

7 p. m.—Washington Post Hour."
p. m.—Harmonious Quartet.
20 p. m.—Ben Cain, guitar.
30 p. m.—Golden Castle Orchestra.
45 p. m.—Health talk.
10 p. m.—Gypsies."
9-11 p. m.—Opera, "Martha."

han. 1-10 p. m.—Hour of music.

2 noon—Organ recital.
p. m.—Shoreham Orchestra.
30 p. m.—Musical program.

anu artisis.

1139k—WMAK—BUFFALO—266m

30 p. m.—Murray Whiteman's Serenaders

30 p. m.—Musical program.

639k—WTIC—HARTFORD—476m

- —Happy Hour.
  —Bluebird Orchestra.
  —Warner's Theater: David
  Lewis, Betty Anderson, averly, songs.
  p. m.—Gision Bables.
  p. m.—W. M. Emory, ten
  m.—Furtner Trio.
  p. m.—W. M. Emory.
  p. m.—Furtner Trio.
  b. m.—Furtner Trio.
  c. m.—Fred Frey's Sirens.
- ing lesson.
  6:30 p. m.—Dinner program.
  7 p. m.—WGY Agricultural program.
  7:45 p. m.—Elizabeth Murphy, soprano;
  WGY Orchestra. 1430k—WBNY—NEW YORK—210m p. m.—Marion Orchestra. p. m.—Mr. Pollack. m.—George Langley, tenor. m.—Travelogues. p. m.—Songs.

  30 p. m.—Songs.

  30 p. m.—History of Tarrytown.

  145 p. m.—Anna Howell, planist.

  10 p. m.—Radio test; orchestra.

  10:30 p. m.—Kent Thompson, barytone

  10:45 p. m.—WRW String Trio; orchest 1290k—WOKO—NEW YORK—233m 3. p. m.—Martin Muller, zither, 5:10. p. m.—Florence, Janos, soprano, 5:30. p. m.—Sunshine Sonny, 9. p. m.—Metropolitan Band. 9. m.—Metropolitan Rosenkrantz, 30 p. m.—Dinner music. p. m.—Roycroft Orchestra.
- 9:45 p. m.—Metropolitan Band, 1160k-WRNY-NEW YORK-258m
- :20 p. m.—Studio program. :30 p. m.—Lullaby Lady. :45 p. m.—"Travel," Major Dent Atkir son.

  p. m.—Henriette Angstreich,
  dances.
  8:15 p. m.—"Painting," Celeanor Dugas.
  8:20 p. m.—Studio program.
  8:30 p. m.—Fanny Davidson.
  9 p. m.—"Money in Radio Inventions."
  9:15 p. m.—Travelogue, J. Van C.
  Cooper.

  —Poetry Post.
  Rovs. m.-Henriette Angstreich, piano
- Cooper.
  9:30 p. m.—Poetry Post.
  9:45 p. m.—Hotsy Totsy Boys.
  10 p. m.—Test program; Ferrucci's Orch
- 830k-WHN-NEW YORK-361m o. m.—News party.
  b. m.—G. Glen Gould, talk.
  b. m.—H. Alan Stone's Orchestra.
  c. m.—"Famous Beauties."
- p. m.—Kathryne Adolph, soprano p. m.—Evelyn Chorosh, violinist. m.—Donner music.
  m.—Orchestra.
  p. m.—Joe Ward's Entertainers.
  m.—'Storage Batteries," H. B. Shonis
  p. m.—Roseiand Dance Orchestra.
  p. m.—Walter Schuster, tenor.
  p. m.—Cotton Belt Quartet.
  m.—Shanley's Orchestrate.
- 1100k-WFBH-NEW YORK-273m
- songs.
  5:15 p. m.—Radio Ramblera.
  5:45 p. m.—Doris Freedman, songs.
  6 p. m.—American Legion news.
  6:15 p. m.—Moon-Glo Orchestra.
  6:50 p. m.—Talk on real estate.
  12 p. m.—"At Home Party."
- 1250k-WHAP-NEW YORK-240m p. m.—Dinner music.
  p. m.—Sandy Armour, golf lesson.
  30 p. m.—Vida Milholland, soprano.
  45 p. m.—Earl Palmer, tenor.
  m.—Mary Pinney, pianist.
  15 p. m.—Franklin Ford, news digest.
  30 p. m.—Ruth Montgomery, soprano.
  45 p. m.—Sylvan String Trio.
  15 p. m.—Talk, Hugh Adams.
  30 p. m.—Listeners' variety hour.
- 1940k-WLWL-NEW YORK-288m

  9 p. m.—Borts Popovitzky, planist.
  9:15 p. m.—Odette Le Fontenay, soprano
  9:30 p. m.—Question box.
  9:55 p. m.—Songs.
  10:10 p. m.—Study Club.
  10:30 p. m.—Quartet.
- 1098k-WBBR-STATEN ISLAND-279 1058 — WBDs | 1 p. m.—Syrian music. 3:15 p. m.—World News Digest. 3:30 p. m.—Bible instruction. 8:45 p. m.—Syrian music.
  - 6 p. m.—Children's program.
    6:30 p. m.—Dinner orchestra.
    7:30 p. m.—Organ program.
    8-9 p. m.—Recital.
    9 p. m.—Frederick Dolfield.
    9:10 p. m.—Musical program by artists. 9. m.—musical program by artis 970k—KDKA—PITTSBURGH—309n 6:30 p. m.—Dinner concert. 8 p. m.—News itams; markets. 8:15 p. m.—University of Pittsburgh dress
    - 8:30 p. m.—Engineering Society banquet 650k-WCAE-PITTSBURGH-461m
    - p. m.—Grand opera. 770k—WEAR—CLEVELAND—390m p. m.—Allen Theater Orchestra. 770k—WTAM—CLEVELAND—390m
    - p. m.—Dinner music. 1 p. m.—Orchestra and artists. midnight-1 a. m.—Dance music. 1106k—WDAC—AKRON, OHIO—258m 0 p. m.—Dinner concert. . m.—India Owls. 1020k—WAIU—COLUMBUS—294m
    - 8 p. m.—Oldtime fiddlers.
      920k—WKRO—CINCINNATI—326m 1 a. m.—Theatrical stars.

      1:30 a. m.—Helvey's Troubadours.

      920k—WSAI—CINCINNATI—326n
    - 12-1 a. m.-Community Orchestra n.—Dance music. 710k—WLW—CINCINNATI—326m
    - o. m.—Dinner concert; basketball talk. b. m.—"Times-Star" concert. p. m.—"Post" Dance Orchestra. 580k—WCX—DETROIT—517m 8-9 p. m.—Studio concert. 580k—WJR—PONTIAC, MICH.—517m 7 p. m.—Orchestra; soloists. 9 p. m.—Music program. 11:30 p. m.—Jewett Jesters. 850k—WWJ—DETBOIT—353m

Wave Station length

252 861

MONDAY, JANUARY 25

TUESDAY, JANUARY 26 -

WGCP WHN

6 p. m.—Dinner concert. 8 p. m.—Orchestra and soloists; Gypsies.

Orchestra

Strickland's Janssen's

### Eastern Standard Time

1050k-WREO-LANSING, MICH.-286n m.—Dinnert concert.

1830k—WBBM—CHICAGO—256m

#### 670k-WMAQ-CHICAGO-448m p. m.—Organ; La Salle Orchestra. :40 p. m.—Family Altar League. 870k—WLS CHICAGO 345m p. m.—Bell concert; discussion.

- TUESDAY 610k-WEAF-NEW YORK-492m GIOK—WEAF—NEW YORK—492m 6:45 a. m.—Health exercises. 7:45 a. m.—Prayer service. 11 a. m.—Ann Robertson, violinist. 11:10 a. m.—Wirend of the Time." 11:25 a. m.—Motion picture forecast. 11:50 a. m.—Motion picture forecast. 11:50 a. m.—Motion picture forecast. 12 hoon—Market and weather reports. 4 p. m.—John Ingram's String Quartet 13:30 p. m.—Women's program: Talk soprano solos.
- 7 p. m.—Blache Think, Sophano.
  7:10 p. m.—French course.
  7:30 p. m.—Ross Gorman's Orchestra.
  8 p. m.—Male quartet.
  8:30 p. m.—"The Twins."
  9 p. m.—"Eveready Hour."
  10 p. m.—"Moment Musicale."
  10:30 p. m.—Vincent Lopez's Orchestra.
- 660k-WJZ-NEW YORK-455m 660k—WJZ.—NEW YORK—455M
  1 p. m.—Markét reports.
  1 p. m.—Nathan Abas's music.
  2:15, 4, 5:30, 7:15 and 10:30 p. m.—Ne
  2:30 p. m.—Topics for women:
  3:30 p. m.—S. S. Aronson, pianist.
  4:05 p. m.—Luther Mott, barytone.
  4:30 p. m.—Levitow's Concert Orches:
  5:32 p. m.—Market quotations.
  5:52 p. m.—Financial summary." Ru
  Lord.
  6:15 p. m.—"Farms of Gascony." Ru
  Lord.
- Lord.
  6:30 p. m.—New York University course.
  7 p. m.—"Great Dane," Frank Dole, of the
  Herald Tribune.
  7:30 p. m.—United States Marine Band.
  8:30 p. m.—New York Edison hour.
  9:30 p. m.—Wanamaker program: Hayn's
  Emperors of Song.
- 740k-WJY-NEW YORK-405m
- 950k-WGBS-NEW YORK-316m 0 a. m.—Timely talks with Terese... 0:10 a. m.—Frank Galassi, songs. 0:20 a. m.—Household talk; songs. 0:40 a. m.—Reducing talk; songs. :30 p. m.—Scripture reading. :35 p. m.—Jazz pianist. :45 p. m.—Ruth Maschke, soprano;
- 6:30 p. m.—Japanse songs.
  6:35 p. m.—Interview with Mrs. Sessue
  Hayakawa.
  6:40 p. m.— Sessue Hayakawa and Tsuru
  Aoki, interview.
  6:50 p. m.—Charles Jones, "Salesmanship."
  7 p. m.—Concert orchestra.
  8 p. m.—Y. M. H. A. "Old Timers."
  8:15. p. m.—The Sympathy Snatchers'
  comedy.
  8:30 p. m.—John Bowe, barytone.
  8:50 p. m.—Belle Bart.
  9 p. m.—Dance orchestra.
  9:35 p. m.—J. Gelli, barytone.
  9:55 p. m.—J. Gelli, barytone.
  9:50 p. m.—William Scheinpfing, flautist.
  10 p. m.—Moses Brothers.
  10:3 0p. m.—Dance orchestra.
  8:30k.—WHN.—NEW YORK.—361m
- 830k-WHN-NEW YORK-361
- 830k—WHN—NEW YORK—361m
  12:30 p. m.—Organ recital;
  2:15-3:15 p. m.—Overture and vaudeville
  1:15-4:30 p. m.—Lexington Orchestra,
  1:30 p. m.—Everglades Orchestra
  p. m.—Vincent Lopez's Orchestra.
  1:30 p. m.—Will Oakland's Orchestra,
  p. m.—Herman Streger, planist,
  1:15 p. m.—Baby Edna Keir, songs,
  1:30 p. m.—Hugo Angelo, tenor,
  1:45 p. m.—Versatile Serenaders,
  1:5 p. m.—Versatile Serenaders,
  1:5 p. m.—Vincent, Val and Miller, songs,
  1:5 p. m.—Judith Roth, soprano,
  1 p. m.—Musical: program,
  1:580k—WMCA—NEW YORK—341m 1590k—WOO—PHILADELPHIA—508m
  11 a. m.—Grand organ.
  12 (noon)—Luncheon music.
  4:45 p. m.—Grand organ; trumpets.
  7:30 p. m.—Dinner music. 590k—WIP—PHILADELPHIA—508m :45 p. m.—Setting-up exercises. p. m.—Organ recital. p. m.—Artist recital. 3 p. m.—Artist recital.
  6:05 p. m.—Al Lentz's Entertainers.
  7 p. m.—Roll Call; Birthday List.
  8 p. m.—Elliott Lester, dramatic critic.
  8:15 p. m.—Wagner Male Quartet.
  9:15 p. m.—Woyle broadcast.
  10:35 p. m.—Pagoda Orchestra.
- 880k-WMCA-NEW YORK-341m a. m.—Homemaker's hour.
- m.—Hugo Zeller, "Lacquer."
  m.—Pace program.
  p. m.—W. Curtis Nicholson. 9:30 p. m.—W. Curtis Nicholson, Right Word." 10:30 p. m.—Manhattan Serenaders. 1,250k—WHAP—NEW YORK—240m p. m.—Dinner music. p. m.—Oliver Anderson, 'cellist.
- baker.

  7:45 p. m.—Christine Fonteyn, soprano.

  8 p. m.—Christine Fonteyn, soprano.

  8 p. m.—Cellist; news digest.

  8:330 p. m.—Edgar Gruen, barytone.

  8:45 p. m.—Antoinette Kaufman, planist.

  9 p. m.—Mary Hopple, contralto.

  9:15 p. m.—Steel Jamison, tenor.

  9:45 p. m.—Mary Hopple, contralto.

  10 p. m.—Poetry reading.

  10:15 p. m.—WhAP male chorus.

  1430k—WGNY—NEW YORK—210m

WEAF 492 WRNY 258 WEBJ 278 WNYC 528 WHN 361 WGBS 316 WMCA 341 WGBS 316 WIZ 455 WEAF 492 WFSH 273 WRC 469

WEDNESDAY, a WGCP | 252 WHN 361 WOR 405 WBZ 333 WMAK 266 WMCA 341 WNYC 526 WGR 405 WHN 361 WLIT 895 WLIT 895 WOO 508 WJZ 455 WNYC 526 WRW 273

WEDNESDAY, JANUARY 27

Ross Gorman's
Oriando's
Al Ciccone's
Harry Ash's
Versatile
Dance music
Manhattan
Dance music
George Olsen's
Vincent Lopez's
Fordham
Meyer Davis

Dance music Casino D. Kunts Dance music Glen-Smith's R. Gunther's S. S. Paris Roseland Arcadia Chapman's Dance music Specht's St. George's Galaxy

1000k—WLAU—PHILADELPHIA—2
7:30 p. m.—Recital,
8 p. m.—Building and loan talk,
8:10 p. m.—Three Brothers,
8:25 p. m.—Theater digest; playlet.
9 p. m.—Blind Gospel Singer,
9:30 p. m.—Sea Isle Orchestra,
10 p. m.—Harry Link, songs,
10:30 p. m.—Billy Hays's Orchestra, 8:25 p. m.—Theater digest; playlet.

9 p. m.—Blind Gospel Singer.

9:30 p. m.—Sea Isle Orchestra.

10:30 p. m.—Harry Link, songs.

10:30 p. m.—Blilly Hays's Orchestra.

10:90k—WHAT—ATLANTIC CITY—275m

2 p. m.—Seaside Trio.

7:30 p. m.—Mort Eiseman's "Through the Stage Door."

8 n. m.—Studio program

560k—KYW—CHICAGO—536m

8.35 p. m.—Musical program

10 p. m.—Hour of music.

12 p. m.—Hour of music.

2 a. m.—Insomnia Club.

670k—WMAQ—CHICAGO—448m

7 p. m.—Organ; La Salle Orchestra.

9 p. m.—Book talk; travel talk.

10 n. m.—University of Chicago lecture. 1430k—WGNY—NEW YORK—210m
7:45 p. m.—Milton Bransford, tenor.
8 p. m.—Bernhard Niemeyer, stories.
8:15 p. m.—Elizabeth Ward, soprano.
8:30 p. m.—R. J. Smith, banjoist.
9 p. m.—Olive Stringer, soprano.
9:20 p. m.—Mr. Webber, planist.
9:45 p. m.—Bernard Six Orchestra. 8 p. m.—Studio program. 9:30 p. m.—Orchestra and soloists. Dance Orchestras for This Week

WHN 861 WMCA 341

WNYC 526
WGBS 816
WRNY 258
WGCP 252
WOKO 233
WRW 273
WMAK 275
WPG 300
WGBS 816
WBZ 333
WGCP 252
WJZ 455
WHN 361
WRC 469
WHN 361

THURSDAY, JANUARY 28

FRIDAY, JANUARY 29

Black Diamond Crystal Orlando's Strickland's University Palace

Dance music

Gene Ingraham's Kenwood Janssen's I. Abrams's McEnelly's Sun Dial Geller's

### 1000k—WPG—ATLANTIC CITY—300m 1:30 p. m.—Luncheon music. 6:30 p. m.—News flashes. 6:45 p. m.—Organ recital. 7 p. m.—Dinner music. 8 p. m.—Fashion flashes. 8:15 p. m.—Plaza artists. 9 p. m.—Dual trio. 10 p. m.—English, Irish, Scotch and Weish music. 10:30 p. m.—Karl Bonawitz, plane recital. 1000k-WPG-ATLANTIC CITY-300m

790k—WGY—SCHENECTADY—380m p. m.—Music; plano recital.

p. m.—Organ recital. p. m.—Dinner program. p. m.—Address, "The

viera.'' :30 p. m.—Mayflower Orchestra

1100k-WRW-TARRYTOWN-273m

940k-WGR-BUFFALO-319m 8:30 p. m.—Dinner music. 8-11 p. m.—Program same as WEAF.

1080k WHAM ROCHESTER 278m 30 p. m.—Eastman Theater Orchestra p. m.—Recital. p. m.—Theater orchestra.

n.—Legislature dinner from Albany m.—"The Grand Tour."

0 p. m.—Weather; market report. 0 p. m.—Edison Hour from WJZ.

- 570k-WNYC-NEW YORK-526m 55 p. m.—Bessie Simon, planist,
  55 p. m.—Charlotte Reynolds, recitations
- 10 p. m.—Song recital.
  130 p. m.—Song recital.
  130 p. m.—Harry Ash's orchestra.
  130 p. m.—Dinner of Society of the Genese
  130 c. Stanley Mitchell, Mayor James
  130 c. Walker, R. E. M. Cowie, and Charles I.
  131 Summerall.
- 1100k-WEJB-NEW YORK-273m p. m.—Original Moonlight Ramblers;
  45 p. m.—Jack Gall, pignist.
  p. m.—Railroad talk, Garrow Geer.
  10 p. m.—Benjamin Jarmus, tenor.
  25 p. m.—Al Ciccone's Orchestra.
- 1140k-WBPI-NEW YORK-263m a. m.—Happy Hour; "Radio Cooking p. m.—Ray Nichols's Orchestra.
- soprano.
  7:45 p. m.—Popular science talk.
  8 p. m.—113th Infantry Band.
  9 p. m.—Insurance talk.
  9 p. m.—Herman Heller's Orchestra.
  10 p. m.—Boy Scout Entertainers.
- 1160k-WRNY-NEW YORK-258m
- 1130k—WMAR—BUFFALO—266m :15-7:15 p. m.—Dinner music. :30 p. m.—American Legion. 30 p. m.—Songs.
  45 p. m.—Club women's hour.—
  30 p. m.—Mary Roberts.
  45 p. m.—Jack Wheaton's Orchestra.
  55 p. m.—New York Neighborhoods.
  p. m.—Miscellaneous talks. 130 p. m.—American Legion.

  1070k—WNAC—BOSTON—280m

  10:30 a. m.—Women's Club; music.

  12:15 p. m.—Noon service.

  1 p. m.—Luncheon orchestra.

  4 p. m.—Theater music.

  5 p. m.—The Smilers.

  1:30 p. m.—Dinner dance.

  1:30 p. m.—Care of the Hair."

  1:15 p. m.—Opera company, "Die kure." p. m.—Miscellaneous talks.

  20 p. m.—Law series.

  30 p. m.—'Driving Hints," C. E. Rauch.

  45 p. m.—Orlando's Orchestra.

  15 p. m.—Light opera series.

  p. m.—'The Audio Amplifier,'' Leon L.

  Addinger.
- 9 p. m.—"The Audio Amplifier," Leon L Adelman. 9.15 p. m.—Theater Magazine says:: 9.30 p. m.—June Lee, singing. 10 p. m.—Test program: Odierno's opers singers.
- 860k—WEEI—BOSTON—349m

  2 p. m.—Eugene's Singing Orchestra.
  6:20 p. m.—Talk.
  6:35 p. m.—Lost and found; weather.
  6:45 p. m.—Big Brother Club.
  7:30 p. m.—Musicale.
  8-11 p. m.—Program same as WEAF. 1100k-WFBH-NEW YORK-273n . m .- Kenneth Casey's Orchestra: 30 p. m.—"The Harps."
  p. m.—Signor Arziello, barytone.
  15 p. m.—Mrs. Sprague, contralto,
  30 p. m.—Tea Table Talk; songs.
  p. m.—Dotty McLean, Leo Ford.
  30 p. m.—Rubey Cowan, songs.
  45 p. m.—Joe Sherman, Jack Nell, so
  p. m.—Nancy Corrigan, soprano.
  (15 p. m.—Radio talk.
  (30 p. m.—Majestic String Ensemble.
  1 30 p. m.—Majestic String Ensemble. 900k—WBZ—SP'GFIELD, MASS.—333m 6:30 p. m.—Little Symphony Orchestra. 6:45 p. m.—Lenox Ensemble. 7:30 p. m.—'Literary Values in Books." 8 p. m.—Professional hockey game, Bos ton Bruins vs. Ottawas. 1120k-WTAG-WORCESTER-268m
- 1120k—WTAG—WORCESTER—268m 110:30 a. m.—Musical selections.
  2105-2 p. m.—Luncheon music.
  215 p. m.—Story teller; markets.
  45 p. m.—Professor Arthur French.
  21 p. m.—Program same as WEAF.
  30 a. m.—Women's hour, from WJZ.
  31 noon—Organ recital.
  32 p. m.—Washington Orchestra.
  33 p. m.—Hamilton Orchestra.
  46 6:50 p. m.—"Show Shopping," Leonard 76 Hall. 950k—WAHG—RICHMOND HILL—316m 2:02 noon—Musical program. p. m.—Joe Zimmerman's Orchestra. 1270k-WBOO-RICHMOND HILL-236m

1190k-WGCP-NEWARK-252m

760k-WLIT-PHILADELPHIA-395n

760k-WFI-PHILADELPHIA-395m

19. m.—Concert orchestra.

1 p. m.—Dance orchestra.

1 p. m.—Educational talk.

3 p. m.—Male Quartet.

11 p. m.—Program same as WEAF.

1080k—WCAU—PHIIADELPHIA—278m.

30 p. m .-- Republican Wome

. sylvania; recital. 7:30 p. m.—Dream Daddy. 7:50 p. m.—Plays reviewed.

- 10:02 p. m.—Test program; "British Ni 740k—WOR—NEWARK—405m 6:45, 77:15, 7:45 a. m.—Gym Class. 2:30 p. m.—Elva Evans, soprano. 2:45 p. m.—Yama Yama Boys. 3 p. m.—Elva R. Evans, soprano. 3:15 p. m.—Jack Smith, -barytone. 3:30 p. m.—Yama Yama Boys. 3:45 p. m.—Jack Smith, barytone. 6:15 p. m.—Words mispronounced. 6:17 p. m.—Words mispronounced. 6:17 p. m.—Bill Wathey, "sports." 6:30 p. m.—Man in the Moon Stories. 6:55 p. m.—Jacques Jacobs's Ensemble 7:20 p. m.—News builetin. Hall.
  7 p. m.—Lee House Trio.
  7 15 p. m.—Radio School of Internations Relations.
  7 30 p. m.—United States Marine Band.
  8 30 p. m.—New York Edison hour.
  9 30 p. m.—To be announced.
  10 30 p. m.—Mayflower Orchestrs.
  12 midnight—Meyer Davis's Band.
  1220k—WBAL—BALTIMORE—246m
  - 30 p. m.—String trio.
    30 p. m.—Male quartet.
    9 p. m.—Choir of Eutaw Place Temple.
    970k—KDKA—PITTSBURGH—309m 130 p. m.—Dinner music. 115 p. m.—University address. 130 p. m.—Sacred song hour.
  - m.—Symphony orchestra. 650k—WCAE—PITTSBURGH—461m p. m.—Program from W. —WADC—AKRON, OHIO
  - 0 p.m.—Dinner concert,
    p.m.—Studio concert,
    p.m.—"Times-Press" hour,
    770k—WTAM—CLEVELAND—390m 770k—WEAR—CLEVELAND—390m
  - 6:30 p. m.—Twilight musicale.
    7:30 p. m.—Studio concert.
    8 p. m.—Orchestra.
    9 p. m.—Program same as WEAF.
    10:30 p. m.—Music.
    1 a. m.—Dance music.
    7:10k—WLW—CINCNNATI—422m
  - p. m.—Musical series; talks.
    p. m.—Oldtime revue.
    p. m.—Formica Orchestra.
    120 p. m.—Musical handshakes.
    920k—WKRC—CINCINNATI—326m
    midnight—Songs; Alvin Boehr's
  - chestra. 580k—WCX—DETROIT—517m p. m.—Michigan Night.
    p. m.—Red Apple Club.
    580k—WJR—PONTIAC, MICH.—517m o p. m.—Dance music.
    m.—Dance music.
    m.—Michigan Night.
    850k—WWJ—DETROIT—353m
  - m.—Program from WEAF. 1050k—WREO—LANSING—286m 6 p. m.—Dinner concert. 8:15 p. m.—Band; glee club; artists. 750k—WHT—CHICAGO—400m p. m.—Classical recital.

    45 p. m. (238 meters)—Alamo Orcho
    030 p. m.—Entertainers.

    12 midnight—Dance music.

    a. m.—"Your Hour" League.

    560k—KYW—CHICAGO—536m

WHN 861 WLIT 395 WPG 300 WCAP 469 WTIC 476 WEAZ 455 WRW 273 WHN 861 WMCA 341

WGBS
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SATURDAY, JANUARY 26

Dance music
Dance music
Boys'
Dance music
Dance music
Ben Bernie's
Lorraine
Lyric
Dance music
Jack Denny's

Dance music Strickland's Orlando's Daven Ben Bernie's

1040k—WLWI—NEW YORK—288m p. m.—"Accountancy," by K. of C. 15 p. m.—Entertainment. 45 p. m.—McEvoy concert. 0:15 p. m.—Talk. 0:30 p. m.—Violin solo; duets. 1100k-WFBH-NEW YORK-273m

ire, John A. Ritchie.

570k—WNYC—NEW YOBK—526m 0 p. m.—Market high spots, 0 p. m.—Piano selections. 0 p. m.—Elementary Spanish lessons.

- 1100k—WFBH—NEW YORK—273m

  p. m.—Al Ciccone's Orchestra.

  p. m.—Studio program.

  p. m.—Glee Club.

  115 p. m.—Songs.

  p. m.—George Ward, recitations.

  125 p. m.—Eenmeth Casey.

  125 p. m.—Kenneth Casey.

  135 p. m.—Kenneth Casey.

  135 p. m.—Katherine Connelly, soprano.

  p. m.—Songs by Abner Silver, Georg.

  Ballentine, Volley Endriss, Ralph Gallo

  p. m.—Ida Chamberlain, songs.

  125 p. m.—Murlei Anderson, contralto.

  125 p. m.—Congress Theater Orchestra. 1250k-WHAP-NEW YORK-240m
- 1250k—WHAP—NEW YORK—240m
  p. m.—Dinner music.
  p. m.—Marion Kener, soprano.
  15 p. m.—WHAP String Sextet.
  16 p. m.—News digest.
  130 p. m.—WHAP String Sextet.
  p. m.—Marion Kener, soprano; Irene.
  20 p. m.—Marion Kener, soprano; Irene.
  20 p. m.—Marion Kener, soprano; Irene.
  30 p. m.—Augusta E. Stetson, reading.
  30 p. m.—Augusta E. Stetson, reading.
  40 p. m.—Lucile Wilkin, planiste.
  4120 p. m.—Lucile Wilkin, planiste.
  4120 p. m.—Dari Bethmann, barytone.
  4120 p. m.—Dari Bethmann, barytone.
  4120 p. m.—Address; Shripe concert.
  4120 p. m.—Address; Shripe concert.
  4120 p. m.—Address; Shripe concert. 1140k—WBPI—NEW YORK—263m a. m.—Happy hour program. b. m.—Al Makon Orchestra.
- tainers,
  30 p. m.—Friedman and Finch, songs.
  8 p. m.—Lillian Spitzer, Alice Rinck,
  Flora Benson, songs.
  p. m.—Ruo Vignon Entertainers,
  0 p. m.—"Bill" McWalters, songs.

- | p. m.—Berr propagation | p. m.—Berr propagation | sical club. | 810k—WEBH—CHICAGO—370m | 8 to 9 p. m.—Dinner concert; songs. | 10 p. m.—Theater bits; news. | 12 to 1:30 a. m.—Dance music; s
- features.
  1380k-WOK-CHICAGO-217m
  Concert and dance r
- 9 p. m.—Songs by artists. m.—Midnight jamborees. 1130k—WENR—CHICAGO—266m
- day."

  45 p. m.—Marine Band.

  45 p. m.—Edison Hour.

  50 p. m.—Edison Hour.

  50 p. m.—Speeches at the annual Legislature dinner of the American Legion.

  50 p. m.—The. Grand Tour: "The Ri
  57 p. m.—Rainbow Sky

  58 m.—Ginger hour.

  1330k.—WRBM.—CH m.—Dinner concert, m.—Rainbow Skylarks.

WEDNESDAY

plano
1:30 p. m.—Scripture reading.
1:35 p. m.—Lee and Adler, songs.
1:40 p. m.—Hida Ramon, soprano.
3 p. m.—Hospital program for I
Jack, Murray, W. H. McGowai
Briggs, Loretta Hurley.
3 p. m.—Uncle Geebee.
1:30 p. m.—Jersey Collegians.
7 p. m.—'Movie Sidelights.''
1:10 p. m.—Jersey Collegians.

830k-WHN-NEW YORK-361m

m.—Moser Brothers, yodiers. m.—Leo Kaufman, baritone.

130 p. m.—Leo Kaurman, baritone.
145 p. m.—Orchestra.
145 p. m.—Cantor Sol Fuchs, songs.
145 p. m.—Katherine Godfrey, soprano.
145 p. m.—Katherine Godfrey, soprano.
145 p. m.—Thomas Flynn, songs.
15 p. m.—Uncle Robert's Pals.
16 p. m.—Uncle Robert's Pals.
17 p. m.—Vladimir Tobachnik, songs.
18 p. m.—Keil's Harmonica Band.
19 p. m.—Parody Orchestra.
19 p. m.—Akradyne Entertainers.
19 p. m.—Lulu Weyant, songs.

m.—Lulu Weyant, songs.
p. m.—Rabbi M. Schuchatowitz.
p. m.—Cantor Steinberg, songs.
p. m.—William Goble, tenor.
p. m.—O'Brien Brothers, guitars.

880k-WMCA-NEW YORK-341m m.-Olcott Vail's String Ensemble.

1160k-WRNY-NEW YORK-258n

m.—Dr. Sherman, "Nerve m.—Club women's hour.

#### Sp. m.—Helen MacKellar. 8:05 p. m.—Ballin and Race, piano duo 8:20 p. m.—Ywhy We Misspell." 8:35 p. m.—Sam Siegel, mandolin. 8:50 p. m.—New York Culver banquet. 9:30 p. m.—Steamship Paris Orchestra 10:35 p. m.—Madame Clara. Nove Davies singers. 10:55 p. m.—News. 660k-WJZ-NEW YORK-155m a. m.—Wonien's hour. 30 p. m.—Market reports. p. m.—Irwin Abram's Orchestra. 15 p. m.—Concert orchestra. 16 4 30, 5 30, 7 30, 10 30 p. m.—News

- 190k—WGCP—NEWARK—252m

  1190k—WGCP—NEWARK—252m

  1 p. m.—Songs by artists.
  110 p. m.—Race results.
  115 p. m.—Good news party.
  115 p. m.—Good news party.
  120 p. m.—Icanne A'Dair, songs.
  121 p. m.—Tracey and Mohr, entertainers.
  121 p. m.—Rengy's Dance Orchestra.
  122 p. m.—Kennedy Harmony Group.
  1230 p. m.—Symphony Orchestra.
  1290k—WOO—PHILADELPHIA—508m

  1 a. m.—Grand organ.
  1 c. m.—Grand organ; trumpets.
  120 p. m.—Dinner music.
  130 p. m.—Dinner music.
  130 p. m.—United States Army, Band. 130 p. m.—Financial summary.
  135 p. m.—American agriculturist.
  130 p. m.—N. Y. University course.
  p. m.—Commodore Dinner Concert.
  p. m.—Esther Adie, soprano.
  135 p. m.—Zoological Society series.
  130 p. m.—Lewisohn Free Chamber M. Concert.

  50 p. m.—N. Y. Public Library Concert;
  Lenox String Quartet.

  10:30 p. m.—Paul Specht's Orchestra. 610k-WEAF-NEW YORK-492m
- n.—United States Army Band. p. m.—Davis Saxophone Octette :45-7:20 a. m.—Health ex: :45 a. m.—Prayer service. p. m.—American Male Quartet. 25 p. m.—Address, Rev. Forest Dager. 30 p. m.—Dance music. 590k.—WIP—PHILADELPHIA—508m
- 145 a. m.—Setting-up exercises.
  0:30 a. m.—Reducing exercises.
  p. m.—Luncheon music.
  p. m.—Artist recital.
  105 p. m.—Dinner music.
  p. m.—Roll call: birthday list.
  760k—WLIT—PHILADELPHIA—395m
  2:05 p. m.—Organ religious p. m.—Ray Nichols' Orcnestra.

  30 p. m.—June Lee, songs.

  45 p. m.—Story hour, Mary Davis.
  p. m.—Dinner music.
  p. m.—Synagogue services.

  30 p. m.—United States Army Band.

  30 p. m.—Davis Saxophone Octet.
  p. m.—Ipana Troubadours.

  0 p. m.—Raxy's Gang. 0 p. m.—Talk; artist recital.
  0 p. m.—Dream Daddy.
  0 m.—Studio recital.
  0 m.—Bánd concert. 95k-WGBS-NEW YORK-316m
  - p. m.—Arcadia Dance Orchestra. | 760k—WFI—PHILADELPHIA—395n p. m.—Dance orchestra. 1080k—WCAU—PHH.ADELPHIA—2781

Party. 950k—WAHG—RICHMOND HILL—316m. 12:02 p. m.—Anthony Schaefer, saxophon-

m.—Brooklyn Automobile Show.
p. m.—Palisade Dance Orchestra
m.—Michael Lamberti, cellist.
p. m.—Talk on "Motor Boating."

0.02 p. m.—Test program: Bran Trio; Serenaders Plectrum Quintet. 740k—WOR—NEWARK—405m

145-7:15-7:45 a.m. Gym class. 30 p. m.—Anna Erikson, planist. 45 p. m.—Lenore Lynne, soprano. 15 p. m.—Percy Boat, barytone, sopra

- i 1080k—WCAU—PHHADELPHIA—278s 6.45 p. m.—The Parodians. 8. p. m.—Health talk. 9. p. m.—Gypsy. Band. 9.30 p. m.—Jones's Jolly Four. 10.30 p. m.—Ew Chapman's Orchestra. 10:30 p. m.—Dwight Strickland. 10:45 p. m.—Frank Cook., songs. 12 midnicht—Artie Bittong's Cheer-Up. 790k—WGY—SCHENECTADY—380m 6:30 p. m.—Program for children. 6:45 p. m.—Dinner program. 7:30 p. m.—"Book of Knowledge."
- 10:20 p. m.—Eugene Farrell, songs. p. m.—Galaxy Orchestra. 940k—WGR—BUFFALO—319m
- 6:30 p. m.—Two plano recital.
  8 p. m.—Address by Hanford McNider.
  8:30-10 p. m.—Jointly with WEAF.
  10 p. m.—Attirst recital.
  10:30 p. m.—Bernice Riggs's friends.
  10:80k—WHAM—ROCHESTER—278m
  7 p. m.—Eastman Theater Orchestra.
  7:30 p. m.—Weather; market report.
  8:05 p. m.—Concert by instrumental trices of the second of the se
- 8-9 p. m.—Musical. 9-10 p. m.—Dance program. 12 midnight-1 a. m.—Comp. grain. 630k-WTIC-HARTFORD, CONN.-476m 30 p. m.—Dinner concert,
  p. m.—Band concert,
  p. m.—Talk, "Mathematics."
  1070k—WNAC—BOSTON—280m
- 1070k—WNAC—BOSTON—280m
  12:15 p. m.—Noon servicé.
  1 p. m.—Luncheon concert.
  4 p. m.—Tea dance, direction Billy Losse
  4:20 p. m.—Vocal and piano solos.
  6 p. m.—Kiddies Klub.
  6:30 p. m.—Morey Pearl's Orchestra.
  7:30 p. m.—Boston Federation of Churche
  8 p. m.—Annual dinner Massachuset
- 1. S.45 p. m.—Samuel Polansky, violinist.

  9:15 p. m.—Harvey Corbett, "Architecture."

  9:20 p. m.—Jane Tuttle, "Songs."

  9:30 p. m.—Johnnie Bowles's Orchestra.

  9:35 p. m.—Jealth exercises.

  9:45 p. m.—Jealth exercises.

  9:505 p. m.—Lost and found; weather.

  6:05 p. m.—Lost and found; weather.

  6:15 p. m.—Joe Rines's Orchestra.

  6:15 p. m.—Joe Rines's Orchestra.

  6:15 p. m.—Joe Rines's Orchestra.

  6:15 p. m.—Big Rother Club.

  7:30 p. m.—Wilfred Academy program.

  8 p. m.—Earl Nelson's uke.

  9:00k—WBZ—SPRINGFLD, MASS.—333m

  wire, John A. Ritchie.

  6:30 p. m.—Erogram same as WEAF.
  - 6:30 p. m.—Little Symphony Orchestra.
    6:45 p. m.—Kimball Dance Orchestra.
    7:30 p. m.—Radio Nature League.
    8 p. m.—Daniel Kunts's Orchestra.
    8:30 p. m.—Concert.
    9 p. m.—Lecture recital.
    1120k—WTAG—WORCESTER—268m
    10:30 a. m.—Musical selections; talk.
    12:05-2 p. m.—Luncheon music.
    3-5 p. m.—Tea dansant music.
    5. 7 p. m.—Interesting talk.
    7:15 p. m.—Spanish lesson.
    8:30 p. m.—Davis Saxaphone Octet.
    10:11 p. m.—Roxy's Gang.
    640k—WRC—WASHINGTON—469m
    12 noon—Organ recital.
- 7 p. m.—Advanced Spanish lessons.
  7:35 p. m.—Berlice alrarms.
  7:35 p. m.—Bernard's New York Six.
  8:10 p. m.—Evelyn Schill, soprano.
  8:20 p. m.—Straub and Lambrecht, guitars.
  8:30 p. m.—Evelyn Schiff, soprano.
  8:40 p. m.—Straub and Lambrecht, guitars.
  8:50 p. m.—Evelyn Schiff, soprano.
  8:40 p. m.—Evelyn Schiff, soprano.
  8:40 p. m.—Evelyn Schiff, soprano.
  8:40 p. m.—Evelyn Schiff, soprano.
  7:40 p. m.—Still Green, dulcimer.
  9:30 p. m.—Robert Gunther's Orchestra.
  10:10 p. m.—'The Charms of Fontaine-bleau."
  10:35 p. m.—Police alarms; weather.
  10:35 p. m.—St. George Orchestra.
  10:40k—WLWL—NEW YORK—288m 640k—WRC—WASHINGTON—469m
  12 non—Organ recital.
  1 p. m.—Lee House Trio. ,
  4:15 p. m.—Meyer Davis's Band.
  5 p. m.—'WRC's Foolish Entertainers."
  5:45 p. m.—Talk, Mrs. Nina Reed.
  640k—WCAP—WASHINGTON—469m
  7-11 p. m.—Members of Congress; U.
  Army Band; Saxophone Octet; Troubidours; Roxy's Gang from WEAF.
  970k—KDKA—PITTSBURGH—309m
  6:30 p. m.—Dinner concert. 8:15 p. m.—Dinner concert.
  8 p. m.—When items; markets.
  8:15 p. m.—University address.
  9 p. m.—Chamber music concert,
  650k—WCAE—PITTSBURGH—461m
  8:30 n. m.—Dinner concert
  - 6:30 p. m.—Dinner c. 7:30 p. m.—Address. m.—Concert. 1020k—WAIU—COLUMBUS—294m 7-8 p. m.—Thrift week. 770k—WTAM—CLEVELAND—390m p. m.—Orchestral selections. 770k—WEAR—CLEVELAND—390m
  - 6-7 p. m.—Dinner concert. 8-9 p. m.—Studio concert. 850k—WWJ—DETROIT—353m

8 p. m.—Orchestra and 9 p. m.—Dance music. 10 p. m.—Roxy's Gang.

- 1050k-WREO-LANSING-286m p. m .- Dinner mus 590k-WJR-PONTIAC, MICH,-517m 7 p. m.—Goldkette's Orchestra; soloists. 9 p. m.—Serenaders and soloists. 12 p. m.—Jewett Jesters.
- 560k—KYW—CHICAGO—536m
- 670k—WQJ—CHICAGO—448m m.—Rainbow Orchestra. p. m.—Musical program. m.—Ginger hour.
- 810k-WEBH-CHICAGO-370m 870k-WLS-CHICAGO-345m o' m.-2 a. m. — Bell concert; organ; story; Rodeheaver; symphony orchestra
- 1130k-WENE-CHICAGO-266m 11 p. m.—Popular program.
  3 a. m.—Duets, violin, vocal solos. 670k—WMAQ—CHICAGO—448m m.—Organ recital; story, m.—Northwestern University lecture, p. m.—Musical program, m.—WMAG Players.
- 1830k-WIBO-CHICAGO-226m m.—Dinner concert. a. m.—Request night. 750k-WHT-CHICAGO-400 p. m.—Cassical program. :45 p. m. (238 meters)—Alamo Orchestra
- 0:30 p. m.—Organ recital. 2 midnight—Entertainers. a. m.—Your Hour League. 1380k—WOK—CHICAGO—217m -8 p. m.—Concert; dance music. 2 p. m.—Artists and orchestra. 1330k—WBBM—CHICAGO—226m 3-11 p. m.—String trio; artists. 1-3 a. m.—Artists; dance orchestra.

#### THURSDAY

- 610k-WEAF-NEW YORK-492m 6:45 a. m.—Health exercises. 7:45 a. m.—Prayer service. 11 a. m.—Musical program; talk. 11:20 a. m.—Mayfair extension talk. 11:30 a. m.—Mayrair extension talk.
  11:30 a. m.—University lecture.
  12 noon—Market and weather reports.
  4 p. m.—Maybelle Korman, contraito.
  4:15 p. m.—Julius Koehl, planist.
  4:30 p. m.—Stories and songs for children.
  4:45 p. m!—"Camping for Boys and
  Girls."
- Girls."

  6 p. m.—Dinner music.

  7 p. m.—Mid-week hymn sing.

  7:30 p. m.—The Brothers.

  8 p. m.—'The Larkinites."

  8:30 p. m.—The Harvesters.

  9 p. m.—Clicquot Eskimos.

  10 p. m.—Silvertown Orchestra 660k-WJZ-NEW YORK-455m
- 660k—WJZ—NEW YVKK—450m
  10 a m.—Topics for women.
  12:30 p. m.—Market reports.
  1 p. m.—Nathan Abas's Orchestra.
  2, 4, 5:30, 7:15 and 10:30 p. m.—News.
  2:02 p. m.—Current topics, Paul Eldridge.
  2:30 p. m.—Topics for women.
  3:45 p. m.—Gertrude Weil, soprano.
  4:30 p. m.—Commodore tea music.
  5:32 p. m.—Market quotations.
  5:50 p. m.—Financial summary.
  6:15 p. m.—Co~operative Association.
  6:30 p. m.—New York University course.
  7 p. m.—Judge Jr.
- 6:30 p. m.—New York University course.
  7 p. m.—Judge Jr.
  7 20 p. m.—Madison Concert Orchestra.
  8:30 p. m.—Radio adaptation of "The Reckless Lady."
  9 p. m.—Royal Salon Orchestra.
  10 p. m.—"Political Situation in Washington," Frederick Wile.
  10:15 p. m.—The Record Boys.
  10:30 p. m.—Freddie Rich's Dance Orchestra.
  7/40k—WJY—NEW YORK—405m
  7:30 p. m.—Concert orchestra. 7:30 p. m.—Concert orchestra. 8:30 p. m.—Bell Van Riper, soprano. 9:40 p. m.—Louis Hann, barytone.
- 950k—NGBS—NEW YORK—316m 0 a. m.—Timely talks with Terese. 0:10 a. m.—Lorna Leeds, soprano. 0:20 a. m.—"Better Homes"; songs. 0:40 a. m.—"Public Speaking"; songs. 30 n. m.—Sgrivture seething"; songs. 30 p. m.—Scripture reading.
  35 p. m.—Crescent City Trio.
  p. m.—Woman in the Home! Hour.
  p. m.—Uncle Geebee.
- 6 p. m.—Uncle Geebee.
  6:39 p. m.—Orchestra.
  6:40 p. m.—Arthur Murray.
  6:50 p. m.—Orchestra.
  7 p. m.—Talk; orchestra.
  7:30 p. m.—Tour of the Galeries."
  7:45 p. m.—Dance Orchestra.
  8:15 p. m.—'The Lights of Nagasaki," one-act play by Thurston Macauley.
  8:30 p. m.—Book and play review.
  9 p. m.—Old time minstrels.
  10 p. m.—Lawrence W. Corbett.
  10:05 p. m.—Vanderbilt Orchestra.
  830k—WHN—NEW YORK—Stime
- 830k-WHN-NEW YORK-361m 12:30 p. m.—Organ recital. 3:15-4:30 p. m.—Orchestra.
- 3:15-4:30 p. m.—Orchestra.
  7 p. m.—Iceland Orchestra.
  7 p. m.—Iceland Orchestra.
  7:30 p. m.—Ciro's Orchestra.
  8 p. m.—Will Oakland's Orchestra.
  8:30 p. m.—Grace Schwing, singer.
  8:45 p. m.—Tracy and Mohr, songs.
  9 p. m.—Billie and Marie Van, songs.
  9:15 p. m.—Jack Smith, barytone.
  10:30 p. m.—Kentucky Orchestra.
  12 midnight—Parody Orchestra.
- 880k—WMCA—NEW YORK—341m
  6 p. m.—Olcott Vall's String Ensemble.
  6:30 p. m.—Frank Farnum's Orchestra.
  7:30 p. m.—Jack Cohen, planist.
  7:20 p. m.—Pace program.
  7:25 p. m.—Jack Cohen, planist.
  7:30 p. m.—Bva Kempler, violinist.
  9:30 p. m.—Jack Smith, barytone.
  12 p. m.—Broadway night.
- 1160k-WRNY-NEW YORK-258m
- 1160k—WRNY—NEW YORK—253ma

  12 midnight—Studio program.

  12:30 p. m.—Yama Yama Boys.

  1:30 p. m.—Mrs. Rose Berry, "Painting."

  1:45 p. m.—New books.

  2 p. m.—"Musical Courier Says—".

  6:45 p. m.—Dr. Isaac Landman.

  7 p. m.—"Whose Birthday To-day?".

  7:95 p. m.—Mirror of Sports.

  7:10 p. m.—Commerce of the day.

  7:15 p. m.—Copera notes.

  7:20 p. m.—Chef Cretaux Chats.

  7:45 p. m.—Radio Questions and Answers.

  8 p. m.—Orlando's Orchestra.
- 744 p. m.—Radio Questions and Answers.

  8 p. m.—Orlando's Orchestra.

  8 45 p. m.—'Life's Jokes." Percy Crosby.

  9 p. m.—La New Branch of Chemistry."

  9:15 p. m.—Lucille de Wolfe, songs.

  9:30 p. m.—Essays on philosophy.

  9:35 p. m.—Orlginal songs.

  9:45 p. m.—Movie review.

  10 p. m.—International test; Radio Teddy

  Trio.
- Trio.

  570k—WNYC—NEW YORK—526m

  7:10 p. m.—Trend of the Times.

  7:30 p. m.—Police alarms.

  7:35 p. m.—Black Diamond Serenaders.

  8 p. m.—Augusta Hickok, soprano; John Williams, tenor.

  8:45 p. m.—Martha Weiss, pianist.

  9 p. m.—Hotel Men's Association Dinner: Speakers: Mayor James J. Walker, H. Edmund Machold, Thomas E. Breen.

  1290k—WOKO—NEW YORK—2323
- 1290k-WOKO-NEW YORK-233m m.—Thelma Coleman, planist.
  p. m.—Frank Galassi, songs.
  p. m.—Frances Peper, soprano.
  p. m.—Radio play.
  p. m.—University Club Orchestra.
  p. m.—Elsie Hubener, soprano.
  p. m.—University Orchestra. 1100k—WFBH—NEW YORK—273m p. m.—Rudy Hermann's Orchestra.
- 1100k—WFBH—NEW YORK—273m

  2 p. m.—Rudy Hermann's Orchestra.

  3 p. m.—Studio program.

  3:30 p. m.—The Harps.

  4 p. m.—Radiovues, Mrs. Owen Kildars.

  5:30 p. m.—Cohen's Four Hottentots.

  5:30 p. m.—Joe Pevney, soprano.

  5:45 p. m.—Tommy Tucker, Nat Osborno.

  6 p. m.—Radio Ramblers.

  6:15 p. m.—Norman Secon, recital.

  6:45 p. m.—Asterio Fernandez, tenor.

  7 p. m.—Yorkville Radio Entertainers.

  (Continued on next pages.
- (Continued on next page)

**World Radio History** 

7:85 7:45 8:30 9:45 10:00 10:00 10:05 10:30 10:30 10:30 10:30 10:30

by A. Atwater Kent, radio manufac- Through the county agents of the turer of Philadelphia, that the world's Department of Agriculture Dr. Gilleading grand opera soloists and con- bert has made a survey of radio on cert artists will be heard over the the farm and he knows the farmer's attitude. air in a series of Sunday evening "The new program will appeal to

cast to millions of listeners through agricultural colleges for many years and that there are a good many thoustation WEAF, New York, and other and that there are a good many thousand college men on farms. stations with which it is connected, sand college men on farms. are strongly in accord with Secretary farmer just about as appreciative of Miss Laval's contracto voice has his ship was lying in Yokohama grams, it was said at the Department as anybody else. In fact, he is not prano quality and much beauty. in at good strength, of Commerce in Washington.

tary Hoover is said to feel that in view of the millions of individuals it view of the millions of individuals it reaches, radio should not be regarded simply as a luxury and something to play with, but that it should render a distinct public service in the character of programs it carries into the home, and that the influence should be uplifting. The contribution by Mr. Kent of the services of artists of the first degree to radio, it is felt in Washington as well as in other cities, is a big step toward raising the standard of radio programs. Expressions of approval are heard in many quarters that influence different phases of our national life. Of Educational Value

Dr. John J. Tigert, United States Commissioner of Education, expressed the belief that the bringing of the best class of music into homes, which the series will do, would be of great educational value to radio audiences. He said:

"The benefits of hearing the best music are so great that I have always favored making it available to the greatest number of persons possible. Arrangement of this series marks the attainment of an important milestone in this direction, because it will make a vastly greater number of Americans acquainted with the best music and the best musicians.

"Americans recently have taken an increased interest in music, as is exemplified by their support of many worthy bands and the organization of community opera companies. I believe the broadcasting of radio concerts by internationally-noted artists will stimulate that interest, and do much to increase America's contribution to the sphere of music."

Speaking for the homes represented in the National Congress of Parents and Teachers, Mrs. Arthur C. Watkins, of Washington, D. C., executive secretary of that organization, said:

"By carrying the best class of music into homes, radio will enable thousands of persons, who otherwise might scarcely ever hear the great concert artists, to know and appreciate their voices and talent. This will add immeasurably in the forming of musical ideas, especially by

"In my own home we are especially glad to hear that grand opera artists



KENT Stromberg-Carlson

SPECIALS
DE FOREST Model D 17
Complete
RADIOLA Super-Hotorodyne
Lass Accessories
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FADA 5-Tube Comp. 116 Our one year service policy insures

your continued satisfaction. TERMS \$3 PER WEEK TREMONT

Radiophone Co. 541 E. TREMONT AVE. Phone Tremont 6037 Jinst and Largest Redicator in Barnet MAIL PROMPTLY FLLED

of Agricultural Economics of the With Kent Program Department of Agriculture in Washington and the thought the new years ington, said he thought the new pro-Gratification over the announcement the farmer than to the city man.

concerts this winter is expressed by the farmers," said Dr. Gilbert. "The Jeanne Laval, Contralto, government officials who are fosterspecifically who are fosterlibrary, his radio and his phonolibrary, The concerts, which will be broad- be remembered that we have had "Elijah" with the New York Oratorio that part of the world, previously

"Accordingly you will find the Saturday at 7:15 p. m. so radical in his taste and his isola-The department has given much thought to the improvement of programs that go out on the air. Secre
tion makes him more appreciative and finer things of life. languages, on this occasion she will heard at Yokohama at 6:30 p. m., due aerial take care that all kinks and confine herself to selections in Engnerhaps not so blase and not so lish: "The Three Cavaliers," "The Oliver, U. S. N., is commander of the they should be straightened out sort of thing."

#### Plans for Next Year's Radio Show

J. Clayton Irwin, general manager for Radio World's Fair, has just announced the Third Radio World's Fair will be held at the new Madison Square Garden, Eighth Avenue at Forty-ninth and Fiftieth streets, New York City, September 13 to 20, 1926.

the Bud" and "A Feast of Lanterns." | Because of the greater carrying wires.

national short wave relay system, has reported reception of the sta-A program relayed by the station

to the American fleet cruising in Paby KDKA. cific waters has been picked up in Europe, South America, Australia and Africa have successively re-

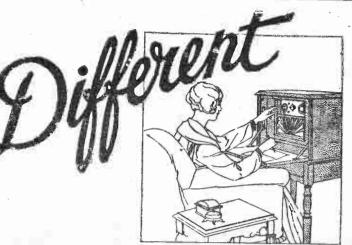
U. S. S. Chaumont heard KDKA while Hoover's appeal for better radio pro- the saner and better kinds of music an upper register of almost true so- harbor. The program was brought tion makes him more appreciative Although she is able to sing in four at 5:30 a. m. at KDKA and was When laying out wires for the This program was put on the air

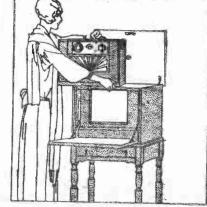
Short Wave Signals of KDKA | power of the short radio waves these Reported Heard in Yokohama have been used by the station for Asia, the last continent to hear Westinghouse station KDKA's intermissions are received by the local stations and re-broadcast. Arrangements are being made for having the Japanese station re-broadcast programs relayed on the short wave

> "Eveready Hour" in Program Of Familiar Numbers

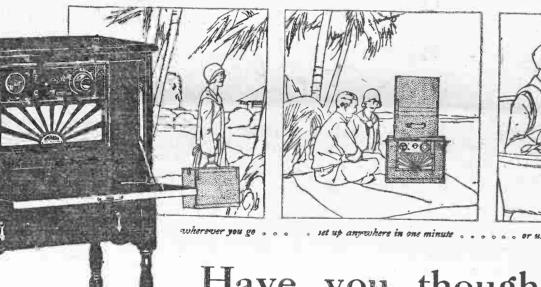
On Tuesday at 9 p. m. the WCTS will be linked with WEAF to

carefully in order not to weaken the









### Have you thought about convenience in a Radio Set

Radio of the finest quality. Simple, powerful, reliable and so convenient that it may be enjoyed anywhere-indoors or out, upstairs or down.

That is the Operadio—a complete, compact, self-contained receiver with loudspeaker, six tubes, batteries, loop and all parts fitted into a case of unbelievably compact proportions. No aerial or outside connections of any kind are required.

A single hearing will convince you that its performance is far ahead of any radio set you have ever heard. Performance of such superb quality and reliability

that the Drake, Roosevelt, Ben Franklin and many other leading hotels chose this set for the entertainment of their guests.

The portable Operadio in its extremely smart carrying case is complete in itself and harmonizes with the mo beautiful surroundings. In this form it is now being used in thousands of homes.

And for those who desire it, the distinguished walnut cabinet shown above is available for housing the set in the home—thus combining the beauty of a furniture model with the convenience of absolute portability.

Any one of hundreds of dealers thruout Greater New York will be glad to demonstrate the Operadio in your home. 30 seconds after his arrival the Operadio will be entertaining you.

THE OPERADIO CORPORATION

The accompanying sketch was made from a photograph COUPON '

The illustration shows the portable Oper-

adio in the cabinet from which it may be

removed in one minute's time and used

in any part of the house or wherever you

go. For those who want a compact set for

home use only, the Operadio also is avail-

able in a distinctive semi-portable mahog-

Prices without tubes or bat-

teries, Portable \$160; Con-

solette\$180; Tudor Cabinet

(for housing portable) \$68.

The Operadio idea was con-

successful self-contained radio

any case—the Consolettes

OPERADIO SALES CORP., 1476 BROADWAY, NEW YORK. Please send literature describing the Operadic.

receiving set, using a kite to

The Original Self-Contained Radio

# THE NEW YORK HERALD New York & Tribune RADIO MAGAZINE

SECTION SIX

SUNDAY, OCTOBER 4, 1925

# Bob, the Boy Radio Fiend, Lays a Ghost

He Accepts Yaller's Dare, Sleeps in the Haunted House, Catches a Fugitive From Justice, Wins Yaller's Set and Receives a Reward-All in One Night

By H. L. VAN DEUSEN



"I thought it was Yaller and made a grab for him."

28.—The newspapers called me you are afraid to spend the night at the Radio Bob, the Boy Deteckative, and all the fellers at school is jellos because I the ghost of the haunted house -Extract from Bob's diary.

VER since the night we had the radio entertainment at School No. 4 in Ponckhockie, Yaller Selgood, president of the School Radio Club, has had it in for me on account of what happened then as some of you folks may recollect. All of which leads up to the haunted house and the weird sounds that were heard by those who had to pass it late at night, and believe me even the cop on that beat always went by the haunted house on the other side of the street.

The other day at school me and Billy Rich were kidding Yaller for getting scared the night of the Radio Club meeting and he said he wasn't any more scared than us and anyway he was a good deal braver than us for his Dad uster be a policeman before he retired on a pension and opened a candy store.

"Huh?" says I. "Just because your Dad was a cop don't say you are a hero." "Is that so?" says he. "Well I bet I am braver than you are."

"What'll you bet?" says I. "Your old radio set against my new five-tube set," says he.

"That's a bet," says I, picking him up quick. Then I says, "How are we going to prove who is the braver, me or you?"

old haunted house alone with me."

To tell the truth I was kinder flabbergasted for I didn't dream that Yaller would have the guts to suggest anything like that, but I wasn't going to let him see I was afraid, and I says, nonchalent like, "Suits me; when do we spend the night there?"

"Friday night," says Yaller. "It's okay by me," says I, "and where will I meet you?"

"At the haunted house at 8 o'clock that night," replies Yaller, and he walked away. "By golly!" observed Billy Rich. "Who'd a thought Yaller had the nerve to

even suggest such a stunt?" "Oh, I don't know," says I careless like. "I don't believe the old house is haunted

"It ain't, ain't it?" retorts Billy. "I'll say it is, for I know a feller whose family moved in and only stayed one day, moving out next morning. I was talking with him and he said a family uster live there that had a colored man working for them and one day the family went away leaving the colored man and their three-year-old daughter home.

"The colored man went crazy or something and taking an axe he cut off the rather hoping that Yaller would back out girl's head and then chopped off his own. Ever since then you can see him at mid- than ever when I met him and he asked Well Yaller kinder scratched his head | night parading through the house carry- | me what doctor he should call in case I for a minute and then he says: "I bet | ing the kid's head and his own in his | fainted from fright or something.

arms. I never seen him, but this feller I am telling you of did and you can bet one has ever lived in there since."

I wasn't right anxious to meet a headless black man walking at midnight, I am free to confess, but I wasn't going to let no Yaller Selgood prove braver than me even if his Dad uster be a policeman, and I told Billy as much.

"Well, it's your funeral, not mine," says he as we walked home.

As we were passing the newspaper office we saw a big crowd around the bulletin board and we stopped, too. There is a notice reading how the county was offering a reward of \$500 for the apprehension of one "Louie the Blood" also known as the "Professor," who was being held on a murder charge for the grand jury and had made his escape from the county jail a couple of weeks back. Among other things it stated that the "Professor" was a radio bug.

"Gee!" says I to Billy, "that \$500 looks good. We could get a jimhicky radio equipment with that much money."

"You know the slogan of the Northwest Mounted," says Billy grinning. "It's 'Get

Well things moved along kinder quiet like until the fateful Friday. I was at the last minute, but he was chippier

"You'd better get your heart examined," snapped I, "to see if it is strong enough to to send flowers to your house."

A Little Shaky, but Game

While I spoke up brisk like still I was kinder shaky at the knees, but I wasn't going to let him know it, not by a jugful. "Better bring along a blanket," advised Yaller, "in case you ain't too scared to sleep in the haunted house." "That ain't a bad idea at that," says I.

forcing a grin, and then I left him, saying I would be on hand prompt at 8 that night. At supper I told Dad and Ma that I had been invited to spend the night to Billy's house and they didn't raise any objection, 'cept Dad said he hoped I wasn't up to any goshdarned foolishness.

I left the house about 7:30 with a blanket rolled up under my arm and walked over to the haunted house.

Up to the last minute I was hoping that Yaller would be only bluffing, but he was there ahead of me and I knew I had to go through with it for I wasn't going to let no Yaller Selgood make me back water.

We had no trouble getting in the haunted house through a broken cellar window. It was still daylight and we didn't need to light the candle I had brought to find our way about. I suggested we spend the night in the living

"That's where the colored man cut off

(Continued on page four)

### How Ward Fry Wins First Prize at the Mummyville Radio Contest

The Country Storekeeper's Three-Tube Set Hears Better DX Than Any Other Set in Town

By EDWARD C. HURBERT

DITORS and readers of this little 1 story must not blame me for concocting a faulty narrative. The source of this story was my tobacco pouch and the blame should fall on that, not

My alibi is simple. If I hadn't found my tobacco pouch empty while I was wandering around the mountains of Mummyville, Pa., I would not have gone into Ward Fry's general store. And if I had not met Ward Fry I probably would not have any story to tell.

- I was not surprised at finding a store out in the middle of the woods, for in the country any one who feels like running a store helps himself, no matter where he is located. If no one buys anything, he should worry. He should, but he doesn't. He considers himself a storekeeper; and that is really all that matters. And Ward Fry was just that sort of Mummy. As he emerged from behind the stove I noticed a shiny head, a sun-bronzed face, muscular arms, snapping black eyes and a growth of beard to match that he had become quite attached to since some time last week. His altitude, in his present bald-headed condition, I approximated as five and one-half feet.

"Howdy!" he greeted, politely, noticing that I was a stranger. "Jes' bin foolin' with the radio. She don't seem ter work jes' right to-day, somehow anuther. Know anythin' 'bout them things? An' wat kin I do fer you?" He added the last question hastily, remembering, no doubt, Page 14 of the Storekeeper's Guide published by that great institution of learning in Scranton. I purchased a can of Knockcold tobacco, for that was the best he had in stock, and admitted that I was somewhat of a radio fan. So he became friendly and conversational, and I let him go on, without interrupting, for I was enjoying unexpected amusement.

#### Won a Radio Contest

"I spect you heared that I wuz the real winner of thet radio contest we had up in these parts last winter-no? Funny, it wuz in the Gouldsboro Weekly Trumpet, my pitcher an all bout it. Yep, on the front page! Only I ain't never got the prize yit. Course I should hev gotten it. my old woman sed so, an so did the Trumpet. But, acourse you ain't never heard nuthin, so I'll tell you bout it.

"It started like this—las fall a feller from Scranton cum up these parts an give a demonstration of radio in the Mummyville Town Hall. It didn't cost nuthin, so we all went, an the hall was packed like sardines. Well, after the show this feller cum offern the stage an give us an installment plan of gitting a radio jes like hisen. I was all for goin ter home, but the woman she liked the idea, or the feller or somethin, an she kep apesterin me until I had ter pay the feller \$10, an I been payin' ever since. Don't seem like I'll never git that durned thing all paid fer. But then, the wimmin they gits what they wants—an they wants a lot these days.

"Even if I ain't got the prize yit I got the fun of laughin at them other fellers what got soaked for the money ter please their old wimmin too. There wuz bout ten other boys thet got the same kind what I got, an then some others got a cheaper brand. One feller, Matty Dunning, mebbe you heared of him-no, well, anyways, he's a mean one. Why he's so mean that he didn't even kick off when he was bit by a rattlesnake las summer. Everybody in town sez, they sez, 'Well I pity thet poor damned snake,' when they heard that he was bit. Well, ter git on with my story, this yere feller Dunning, he bought a big, five lamp set, jes so as he cud sneer at the rest of ussen.

#### Dunning Hears Some DX

"The nex time I seen Dunning he wuz tellin' all the boys down at the postoffice all the things what he hears on HIS radio. 'I gits Pittsburgh, an Philadelphia. an Scranton, and New York, an-an Pittsburgh,' he sez, real important like.

ter git him sore. I only got three lamps in mine an I hears China in the Kitchen every night! An all the boys they laughed like hell over that, 'cause they don't like this feller Dunning. He don't belong round here anyways. He cum out from Minysoty on account of his cousin died an left him some money an land. Tain't his money! Naw!

"Well, every time I went down ter that postoffice after thet there wuz somebody arguin' bout radio, mostly with Dunning, sometimes twixt each other. None of 'em knowed nuthin' 'bout it, but they wuz arguin' jes the same. 'Course I got sense, so I jes shut up an didn't argue or say nuthin'. But one night I hears a feller on the radio all the way frum Davenport, Ioway! WO-what wuz it now? WOwell, anyways, I heared this yere feller an wrote it all down so as I cud tell Dun-

ning the next night in the postoffice. "I told the old woman about it nex day an she sez ter me, she sez, 'Ward, you better not tell nobody, 'cause Dunning is a heap bigger than you are, an I won't take care of no more cripples, on account of thet there accident what you hed las December when somebody that you wuz a

"But I didn't pay no attention an went right down ter the postoffice after supper ter tell everybody, 'specially Dunning, what I heared on my radio. He wuz there and so wuz the rest of the gang, all atalkin' 'bout radio. I swaggers up ter the stove, hesitates (for effect you know) an when the whole crowd is a-lookin' at me I sez, 'Dunning, how far you heard on that radio of yourn?'

#### The Fight Starts

"'We-h-ll,' he drawls, tryin' ter think up a gud one, I git Chick-ago. Pretty gud

"Thet all you hears? I sez with a groan. Lizen, I gits Davenport, Ioway. An thets futher away, an nearer the Pacific Coast then Chick-ago. An I only needs three lamps ter do it, I adds in a voice that the whole store cud hear, even old man Thompson, who wears a ear trumpet.

"Dunning git mad right away an' he sez, Ward, you're a danged liar.' Well, I plum ferget what the old woman hed sed, an' I up an hits him-like this, fast, you know -on the nose, on account of thet wuz the nearest part of him ter hit. Well, he aimed a hard sock at me, but I duckslike this—an' then the gang they separated us an' we stops fightin'.

"'Fergit it, an' shake hand,' sez somebody in the crowd who didn't own a radio. "I won't fergit an' I won't shake hands neither, till thet dam fool Dunning pologizers fer callin' me a liar, an' insultin' me an' my radio, I sez in my maddest

"'An' I won't pologize, an' I won't shake hands with a little shrimp like you till you pologize ter me fer gittin' fresh first, an' then hittin' me in the eye,' barks out Dunning an' gits in his flivver an' drives way. Seems as how he wuz bout ter leave the postoffice when I got there, cause his pockets wuz as full as they cud git with saltines he picked out the cracker barrel.

"Nex' day at the postoffice I didn't see Dunning—guess he wuz ascairt ter show hiself-but I did see Jackson Rogers. They call him Jack Rogers fer short, you know. Well, anyway, he's the feller what writes up stuff fer 'The Gouldshoro Weekly Trumpet.' He tells me he heard somethin' 'bout the big fight, an' he asks me all 'bout it an' what I wuz gonna do. I tells him I didn't know an' didn't give a dam, an' he smokes an' thinks a while, an' then a bright idea cum ter him. All of a sudden-like, you know. An' so he tells me how ter git even with Dunning an' make him look foolish.

#### Jack Rogers Has an Idea

"'Lizen,' he sez. You bring your radio ter the Town Hall two weeks frum Friday, an' anybody else what wants to kin bring hissen also, an' I'll offer a prize fer the set what hears the further- it wudn't work right with usin' only offest an' gets the best music. I think | three. But Rogers told him ter use two

"Hell, thet ain't nuthin', I up an sez jes , your radio is better'n Dunning's an' you'll ] of hisen, along with the three thet win, an' the loser 'tween you an' Dunning's got ter 'pologize ter the other feller before the audience. I'll charge 25 cents admission an' get enuf ter pay fer a decent prize. An' I'll put the winner's pitcher in the paper,' he adds as inducement on account of it was an advertisement fer his paper. Folks who'd never saw the 'Trumpet' fore kep gittin' it thinkin' they wuz gonna see their pitcher

> "Well thet night I git ter thinkin' an' wonderin' if my radio wuz as good or better'n Dunning's. I thot it over careful an' got ter kinda worrvin' you knownot cause I was afraid ter not hear as far, but cause I hated the idea of mebbe havin' ter stand up fore all them people an pologize for insultin' an hittin' Dunning. So I went over ter Nate Philpin's. He's got a durn smart son, Nate hasgoes ter college, an' what he don't know ain't worth thinkin' about. Yes, sir! He wuz home on his Chrismas vacation an' I tells him all bout it. Fine feller, Nate junior, jes like his old man. He sed he wuz takin' engineerin in college an' probly cud fix my radio so it wud work better'n fore. So I brung it over ter his house, an' he nods his head an' mutters some funny words ter hiself as he looks at the wiring. An' then he tells me thet there wuz too much, er-r-r-what in hell did he call it now?—well anyways, there wuz too much of this thing an' not enuf the other ter make it very loud, tho he lowed as how I probably cud hear Davenport,

#### Nate Rewires My Set

"So I leaves the set with him a couple of days an' he wired it all up new. Me an' him tried it out a week 'fore the contest, an' we heared Chickago, Cleveland, an' then we hears Omaha, Nebrasky. 'You'll win thet there contest,' he sez ter me, he sez. An' the nex' day he went back ter college astin me ter write him all 'bout the contest an' how it cum out.

"I asts several of the gang round ter see an' hear my new set, tellin' em thet I'd added a little invention of mine on it. Well, they all set there an' lizened. s'prised, an' some of 'em what hed entered thet contest got scairt right away an' dropped outa the contest. Somebody went an' tells Dunning thet my radio wuz a wonder an' he ort ter see it an' hear it. So he cum ter me, Dunning did, an' tried ter be friendly an' all thet, an' find out what I wuz usin' now. But 'tweren't no use, with me when a feller insults me an' my a peanuts down on him from the radio, 'less he 'pologizers, an' then shuts

"Well, the big night cum' round an' the Town Hall was fullern Hell on Saturday nights. All the folks with the price of twenty-five cents showed up, an' them thet didn't hev the price stood outside ter tryter hear thru the winders, but acourse they wuz closed, on account of it was cold as Hell.

#### The Contest Starts

"Jack Rogers wuz there, an' all dressed up in a fancy suit like they wear fer weddins' an' funerals. He hed fixed all the details, picked jedges (most of 'em wuz from Gouldsboro 'cause most everybody in Mummyville what owned a radio wuz there contestin') an' he hed brung along a phonograph horn arrangement what he called a loud screecher, or somethin' like that. Then he hed three lamps, which, accordin' ter the rules what hed bin posted all over the country, wuz ter be used in the radios, one radio at a time, you understand. He explained that the idea wuz so as each feller wud hev an equal chancet, an' not be bothered by lights what weren't as good as some others might be. You might know that Dunning wud put up an awful howl bout this. 'cause his set used five lamps, an' he sed

Rogers brung, an' ter shut up afore he disqualified him.

"Finely the town band wuz made ter shut up, an' after a little speech. Rogers had us draw numbers from a hat ter see who'd go on first, and so on. Well, thet durn fool Dunning got the lowest number an' he steps up ter his set, connects it onto the aerial and other fixins', puts in three of Rogers's lamps an' two of hisen, an' trys ter look like Henry Ford, or somebody important. After lookin' at the other fellers' numbers I finds thet I hed the largest number an' wud hev ter go last of the bunch. I was a bit disapinted, but Rogers he grins an' sez ter never mind as how I'd be the hit of evenin' any-

#### **Dunning Hears Scranton**

"Dunning fooled 'round with his radio fer some time afore he cud even hear anythin', an' then we found out it wuz only Scranton, forty miles away.

"A lot of folks who heard that on a crystal set laughed out loud, and one of the high school fellers shouts out, "Thot you was gonna hear California, Dunning.' laughed real hard at that and I could see Dunning was so mad he couldn't hardly tune the dials. But he's stubborn an' he twisted an' turned them dials until he got WDKA, WIP, WTAM, WEAF, an' finally he got WGN, Chicago. But none of 'em was very loud an' the people in the audience couldn't hardly hear the ones over a hundred miles. Dunning tried to get 'em louder, but he couldn't do it nohow. He sed Rogers's lamps wern't no good an' put in his own. An' the audience jes' roared. 'cause everythin' was weaker than afore. He was maddern the devil on Sundays when the churches is filled.

"He glared over at me an' sez, in a nasty voice, he sez, "Try an' do bettern thet yourself. The aerial ain't no good." Folks who didn't like him, an' few of 'em did, jest busted out laughin', and the high school fellers whistled so dam loud thet the constable hed ter wave his arms an' open his coat an' show his badge afore everybody got quiet agin.

#### My Turn Comes

"The other radios were tried out, but they wasn't no better-most of 'em not as good as Dunning's. An' so, soon it cum my turn, an' afore I could git ter the set, Rogers makes a little speech about me-calls me a inventer, an compares me ter Marconi hiself. All of my friends was there an' all of my woman's relations, 'cause I knowed that he'd try ter copy it, an' I'll bet they's a hundred of 'em countin' or mebbe git ascairt like the rest an drop | me an' her. Well they stamped an' outa the contest. An' I didn't want that. cheered an' the constable hed ter shut No, sir! There ain't no makin' friends | 'em up agin. But somebody drops a bag an' it was a long time afore I could hear the radio myself, right nex' ter it. I aims at somethin' far off first, an' sure nuff along cum WEAF, New York City, hundred miles away. It was twicest as loud as any of the rest, an' thet includes Dunning's too. Folks begin ter sit up an take notice, an' so I trys fer more. KDKA cum in fine, an' funny, but WTAM in Cleveland cum in best of 'em all. It was loudern Scranton had been on Dunning's fool contraption. Jus' bout then I tried ter git Davenport, or somethin' Dunning hadn't got. But somethin' happened an' couldn't git that set ter squeel nor nuthin. It was twicet as dead as Con-

"Dunning acourse grins an' sez, 'You ose, pologize now.'

"'Don't you be in sech a danged hurry—I ain't started yit,' I answers, an' the audience claps and laughs. Rogers hurries over an' looks inter the box an' becum very sad over somethin'. 'What'smatter.' I asts, kinda disturbed, you know.

"'One of the lamps is all wore out-it's dark.' he sez, an' acts helpless like. But then he thinks of a bright idea, only I knew all along it wouldn't work. 'Dunning,' he sez, 'we only got two lamps left. an' we can't finish this yere contest till we git another lamp fer Ward. Now if you

(Continued on page four)

#### Dr.Cadman ResumesAddresses With "A Great Conference" Additional Radio Programs The Rev. Dr. S. Parkes Cadman,

(Continued from page nine)

WRW-TARRYTOWN-273

p. m.-1 a. m.—Supper music. WHAM—ROCHESTER, N. Y.—278

m.—Weather forecast; mar WJAR--PROVIDENCE-306

pastor of the Central Congreational Church, Brooklyn, N. Y., will resume his popular series of addresses at the Men's Conference in the Bedford Branch Y. M. C. A., in Brooklyn, to-day at 3:45 p. m., when WEAF and four other stations will broadcast his address on "A Great Con-

The addition of WEEI, Boston, Mass.; WCTG., Worcester, Mass.; 11 WCAE, Pittsburgh, Pa., and WSAI, Cincinnati, Ohio, to WEAF, will mean a great extension of the audience of this famous inspirational speaker.

Dr. Cadman has just returned from a two months' visit abroad, where in Stockholm, as chairman of the Fed- 11 eral Council of Churches of America, he acted as its representative at the 12 p. m.—World series, play by play. 6:30 p. m.—Young people's period. 7 p. m.—Dinner music. he acted as its representative at the international church conference. His first radio address will describe his experiences, at what he declares was "the greatest religious convention the world has ever seen," where thirty-eight nations were represented by almost every denomination in Christendom.

Special music will be furnished by the Clovic Townstage and Captal 1830 p. m.—Young people's period.
7 p. m.—Dinner music.
8 p. m.—Dance music.
10:30 p. m.—Dance music.
8 p. m.—Dance music.
11:30 p. m.—Poolutar half hour.
10:30 a. m.—Bible readings;
12:15 p. m.—Noon service.
12:15 p. m.—Dance orchestra.
4 p. m.—Concert orchestra.
4 p. m.—Dance orchestra.
4 p. m.—Poolutar half hour.
6:30 p. m.—Dance music.
11:30 p. m.—Poolutar half hour.
8 p. m.—Noon service.
12:15 p. m.—Noon service.
13:10 p. m.—Poolutar half hour.
14:10:0:0:0 p. m.—Dance music.
11:30 p. m.—Poolutar half hour.
15:10:0:0 p. m.—Poolutar half hour.
16:30 p. m.—Poolutar half hour.
17:10:0:0 p. m.—Poolutar half hour.
19:10:0:0 p. m.—Poolutar half hour.
19:10:0:0 p. m.—Poolutar half hour.
19:10:0:0 p. m.—Poolutar half hour.
10:30 p. m.—Poolutar half hour.
19:10:0:0 p. m.—Poolutar half hour.
10:30 p. m.—Poolutar half hour.
1

the Gloria Trumpeters and George
Betts, chime soloist, and the singing
will be under the direction of Howard Wade Kimsey. Halsey Hammond,
the executive secretary, will preside
and present the questions to Dr. Cadman following the address. These
answers to questions were among the

WEEL-BOSTON-349

6:45 a. m.—Health exercises.
10:45 a. m.—Betty Crockner's talk.
2 p. m.—Big Brother Club.
7:20 p. m.—Lost and found; scores.
7:30 p. m.—Sepri Merry Milkmen."
8:30 p. m.—Sepri Merry Milkmen."
8:30 p. m.—Sepri Merry Milkmen."
8:30 p. m.—Sepri half-hour.
9 p. m.—Marimba Band and Orchestra.
WEZ-SPRINGFIELD. MASS.—333 the Gloria Trumpeters and George

most interesting features of the meetings last season.

Reinald Werrenrath in

An Hour's Recital To-night
The first of the series of Atwater
Kent Radio Hours, sponsored by A.

WBZ—SPRINGFTELD, MASS.—333
6:30 p. m.—Leo Reisman's Ensemble.
7:15 p. m.—Morris Ernest, tenor.
8:45 p. m.—Lulo Morgan, contralto.
9 p. m.—J. Clark, tenor.
9:15 p. m.—Daniel J. Morgan, songs.
9:30 p. m.—Sid Reinherz, piano.
9:45 p. m.—Orchestra.
WCTS—WORCESTER, MASS.—268
10:30 a. m.—Radio chat. Kent Radio Hours, sponsored by A. Atwater Kent, prominent Philadel-10:45 a. m.—Radio chat. 10:45 a. m.—Musical selections. phia radio manufacturer, presenting 7:15 p. m.—Story teller; scores. for the first time in the history of 8 p. m.—Concert program
WRC—WASHINGTON—469 radio broadcasting weekly concerts by 10 a. m.—Women's hour from WJZ. Metropolitan Opera stars and other leading artists of the musical world, will bring Reinald Werrenrath, famous American barytone, before the 7:15 p. m.—Market summaries; scores 7:45 p. m.—"Hooking up a Radio Set. microphone in the studios of WEAF 8this evening at 9:15 o'clock, Eastern 9 standard time. For one full hour the 10:15 p. m.—Dance program.

\*\*RDKA—PITTSBURGH—309 WEAF, will enjoy a recital by this noted artist. In addition to WEAF, the following stations make up the chain: WEEI, Boston: WJAR, Providence; WGR, Buffalo: WCAP. Washington; WCAE, Pittsburgh; WSAI, Cincinnati; WWJ, Detroit; WCCO. St. Paul-Minneapolis, and WOC. Davenport. WFI and WOO. Philadelphia. will broadcast these concerts alternately, this evening's hour going through WFI. It is expected that other stations will enlarge this chain,

their addition several piano solos.

#### New Radio Call Book

The fall issue of "The Citizens Radio Call Book" is just out and contains many new features, including a photographic directory of the principal broadcasting stations' announcers in the United States and pictures of the entertainers of some of these stations; also a complete list of all the broadcasting stations of the 6.30 p. United States and the world, together 7:13

nine-tube impedance coupled super book and encyclopedia and is on sale book and encyclopedia and is on sale in all radio stores and news stands.

Published by Citizens Radio Service

Bureau, 508 S. Dearborn Street Chi-

New Factory Necessary The J. B. Ferguson Company, whose The J. B. Ferguson Company, whose general business offices are at 41 East Forty-second Street, New York City, has leased a new factory site in Eleventh Avenue, Long Island City, and will move into the new plant at 10.15 p. m.—Bentistry.

1.475 p. m.—Charles Houbiel, pianist. 8 p. m.—Roosevelt Orchestra. 8:15 p. m.—Motoro Picture Series. 8:30 p. m.—Eleventh Brussels, planist. 9 p. m.—Debut Period. 9:15 p. m.—Debut Period. 9:15 p. m.—Eleventh Period. 9:15 p. m.—Eleventh Period. 9:15 p. m.—Eleventh Period. 9:15 p. m.—Chalif's Dance Demo once. The plant at 80 Beaver Street, strations.

WHN-NEW YORK CITY-361

WHN-NEW YORK CITY-361 New York City, being entirely in- 9 p. m.-Martinique New York City, being children adequate as to space, Mr. Ferguson adequate as to space, Mr. Fergusun was obliged to secure more room, and it is expected the new factory and it is expected the new factory the factory that the days of the factory that the days of the factory that the factory th will be in operation within ten days 8 p. with a greatly increased output of 8:30 Ferguson receivers.

**Battery Co. Gave Dinner** Last Wednesday evening the H. B. Stantz Company. Inc., held the annual sales meeting of U. S. L. battery distributers at the Hotel Empire.

The purpose of the meeting was to get together all distributers of the battery. The entertainment feature was Black Bear, the educated pony.

WMCA—NEW YORK CHYY-341

6 p. m.—Olcott Vail's String Ensemble.
6:30 p. m.—Patrick O'Connor, Thomas
7:45 p. m.—Christine Thompson, planist.
8-p. m.—Whit's Happening Now?"
8:15 p. m.—Christine Thompson, planist.
8:30 p. m.—Cyril Saunders, violinist.
9-11 p. m.—Musical entertainment.
11-12 p. m.—Ernie Golden's Orchestra.

WOKO—NEW YORK CITY—233.

\*\*WOKO—NEW YORK CITY—233.

\*\*B. in ——Christine Thompson, planist.

\*\*B. is p. m.—Elizabeth Blaurock, soprane

B. is p. m.—Christine Thompson, planist

B. is p. m.—Beatrice Meisler, recitations

B. is p. m.—Rearrice Meisler, recitations

B. is p. m.—Kenneth Moltz, tenor.

wJAR.—PROVIDENCE—306
a. m.—Housewives' Exchange.
5 p. m.—World series game.
5 p. m.—Margaret Reid, story teller
p. m.—"Fire and the Law."
5 p. m.—Choir of State Hospital.
p. m.—Maine Hour.
p. m.—Biltrore Orchestra.
wTIC—HARTFORD, CONN.—476 WBBR—STATEN ISLAND, N. Y.—273 8 p. m.—Violin and tenor solos. 8:20 p. m.—Bible questions and answers 8:40 p. m.—Tenor and violin solos. WAHG—RICHMOND HILL, N. Y.—316 12 (noon)—Musical program. 12 midnight—Benton Harbor Orchestra

WBZ—SPRINGFIELD, MASS.—333

m.—Book reviews; scores; WCAP—WASHINGTON—469 m.—Organ recital.
p. m.—"National Capital."
m.—Wardman Park Trio. p. m.—Dinner music.
WLIT—PHILADELPHIA—395

m.—Eimer Grosso's Orchestra.
m.—Dinner music.
n.—''Old New York,'' Henry Brown.
p. m.—Jeanne Laval, contralto.
p. m.—Boris Popovitzky, pianist.
p. m.—Pasadena Warblers.
p. m.—Pasadena Warblers.
p. m.—Punited States Army Band.
m.—Edgar Gruen, barytone.
p. m.—Caroline Thomas, violinist.
p. m.—Cight Opera Quartet.
p. m.—Caroline Thomas, violinist.
p. m.—Caroline Thomas, violinist.
p. m.—Clight Opera Quartet. and announcement will be made upon

Mr. Werrenrath will be assisted by 10:50 p. m.—Light Opera Orches WJZ—NEW YORK CITY—4:55 WJZ—NEW YORK CITY—4:55 Herbert Carrick, piano virtuoso, who, in addition to acting as Mr. Werrenirath's accompanist, will be heard in 4:55 p. m.—Pulltzer Races, from Mitchel Field; second race at 3 p. m. for Pulltzer Trophy.

P. m.—Field second race litzer Trophy.

4:55 p. m.—News, baseball, racing turns.
5 p. m.—Emil Coleman's orchestra.
6 p. m.—Stock market closing prices and quotations.
7 p. m.—Bernhard Levitow's concert.
7 p. m.—Bernhard Levitow's concert.
9 m.—News, baseball, football scores.
10 nest Ballot Association.
11:45 p. m.—Harvard vs. football game.
13:30 p. m.—WNAC dinner dance.
13:30 p. m.—WNAC dinner dance.
13:30 p. m.—Dance music.
15:45 p. m.—Musical program.
16:30 p. m.—Dance music.
17:35 p. m.—The Metropolitan Theater.
18:46 p. m.—Health exercises.
19:47 p. m.—Health exercises.
19:48 p. m.—Health exercises.
19:49 p. m.—Health exercises.
19:49 p. m.—Health exercises.
19:49 p. m.—Health exercises.

with wave length, kilocycle, transmitting schedules, station slogans
and a world of other information.

There are ten complete constructional artiples in this issue on every
tional artiples in this issue on every-

tional articles in this issue on everything from a two-tube receiver to a
nine-tube impedance coupled super

band.
9 p. m.—Paula Fire, soprano.
9:20 p. m.—Paula Fire, soprano.
9:20 p. m.—Paula Fire, soprano.
9:30 p. m.—Paula Fire, soprano.
9:30 p. m.—Paula Fire, soprano. This is a very practical radio call 10:30 p. m.—Arrowhead Orchestra. WRNY-NEW YORK CITY-259

p. m.— Dentistry."
p. m.—Charles Houbiel, pianist
m.—Roosevelt Orchestre

WNYC-NEW YORK CITY-526

For those unable to be eyewit-Mitchel Field on October 8 to 10,

WFBH—NEW YORK CITY—273

2 p. m.—Sunlite Serenaders.

3 p. m.—Bert Lowes's Entertainers,
4 p. m.—Scores (quarter hourly),
4:05 p. m.—Irma Sachs, soprano,
4:15 p. m.—Montana Ramblers,
5:15 p. m.—Bob Schaeffer, Fred Fisher, songs.

5:45 p. m.—Adele Esprl, soprano.

6 p. m.—Southern Serenaders.

7 p. m.—Chris Meehan, tenor.

7:15 p. m.—Lew Henry's Syncopators.

11:30 p. m.—Dance orchestra.

WHAP-BROOKLYN-240

the humming and purring of the mighty motors will be reproduced for every listener. It is expected the 300 airplanes will be entered, includ machines already housed in the hangars. Especial interest will be

12 midnight—Benton Harbor Orchestra.

WOR—NEWARK—405
6:45-7:15-7:45 a. m.—Gym class.
6:15 p. m.—'Words Mispronounced.'
6:17 p. m.—Shelton dinner music.
7:05 p. m.—Talks by aviators.
7:15 p. m.—'Sports,'' Bill Wathey.
7:30 p. m.—Flo Richardson's Orchestra.
8 p. m.—Mabelanna Corby's artists: Mme.
Alba Vietor, violinist; Harriet Hubbard, soprano; Veronica Wiggins, contraito; Dr. Howard Applegate, barytone; Genevieve Applegate, accompanione.

ist., denotore Applegate, accompanist.

8:45 p. m.—Dick and Flo Bernard, songs.

9 p. m.—Arthur Baecht, violinist.

9:15 p. m.—Ida Twerdowsky, planist.

9:30 p. m.—Sol Sabino, mandolinist.

9:45 p. m.—Dick and Flo Bernard, songs.

10 p. m.—Arthur Baecht, violinist.

10:15 p. m.—Ida Twerdowsky, planist,

10:30 p. m.—Sol Sabino, mandolinist.

10:30 p. m.—Earl Rossman, "Alaska."

11 p. m.—Eddie Elkins's Orchestra.

WAAM—NEWARK—263

7 p. m.—Al Makon's Orchestra.

WAAM—NEWARK—263
7 p. m.—Al Makon's Orchestra.
8 p. m.—Allce Laurle, soprano.
8:15 p. m.—Jolly Bill Steinke.
8:30 p. m.—Andrew Hays, tenor.
8:50 p. m.—Alice Laurle's Trio.
9:10 p. m.—Samuel Silverburg, reader.
9:30 p. m.—Fanny Horowitz, planist.
9:50 p. m.—Andrew Hays, tenor.
10 p. m.—Hartley Joy Boys.

WGCP—NEWARK—252
2:45 p. m.—Songs; race results (half-hourly)

2:45 p. m.—Songs; race results (na. hourly).
3 p. m.—Ukelele Lou Hayes; readings.
3:45 p. m.—Johanna Cohen Trio.
4 p. m.—Banjoists .

Indianans Orchestra.

WIP—PHILADELPHIA—508
6:45 a. m.—Setting-up exercises.
1 p. m.—Organ recital.
6:05 p. m.—Dinner music.
7 p. m.—Bedtime story.
8 p. m.—Science lecture.
8:15 p. m.—The Mandolin Club.
10:05 p. m.—Dance music.
11:05 p. m.—Organ recital.
WOO—PHILADELPHIA—508
11 a. m.—Grand organ recital.
12 noon—Luncheon music.
4:45 p. m.—Grand organ; trumpets.
7:30 p. m.—Dinner music.

p. m.—Concert orchestra; recital.
p. m.—Scores and sports results.
p. m.—Scores and sports results.
p. m.—Scores and sports results.
weight of the state of the s m.—Tea Room Ensemble.
m.—Program from Radio Show.
p. m.—Concert orchestra

p. m.—Concert orchestra. m.—Program from Radio Show. WPG—ATLANTIC CITY—300 **SATURDAY** 2:30 p. m.—Baseball game, play by play. 6:45 p. m.—Organ Recital. 7 p. m.—Ambassador dinner music. 9 p. m.—Evening concert. 10:30 p. m.—Dance orchestra. WEAF—NEW YORK CITY—492 6:45-7-7:20-7:45 a. m.—Health exercises. 1:40 p. m.—World series game, play by play description. 4-5 p. m.—Elmer Grosso's Orchestra.

m.—Seaside Trio.

WGY—SCHENECTADY—380

m.—World series game.
m.—Cyprus Temple Band.
p. m.—Dance program.

WRW—TARRYTOWN, N. Y.—273 WGR—BUFFALO—319 2:30 p. m.—World series game.

WHAM-ROCHESTER-278

6:45 a. m.—Health exercises.
7.45 a. m.—Dance orchestra; vocal and instrumental artists.
8 p. m.—Popular program.
8:30 p. m.—Band and orchestra.
9 p. m.—Eisenbourg's dance music.
WEZ—SPRINGFIELD, MASS.—333
3 p. m.—Harvard vs. Middlebury football game.

WRC-WASHINGTON-469
D. m.-New Willard Orchestra.
p. m.-Washington Orchestra.
p. m.-Bible talk.
135 p. m.-Musical program teries; loud speaker; aerial equipr 8:15 p. m.—Musical program.
10:30 p. m.—Crandall Saturday Nighters
KDKA—PITTSBURGH—309

Greenhuts stores

6:15 p. m.—Dinner concert. 7:30 p. m.—Children's period. 8:30 p. m.—Westinghouse Ban

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bard, soprano; Veronica Wiggins

contralto, and Dr. Howard Applegate

barytone, who will be accompanied

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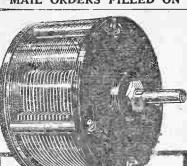
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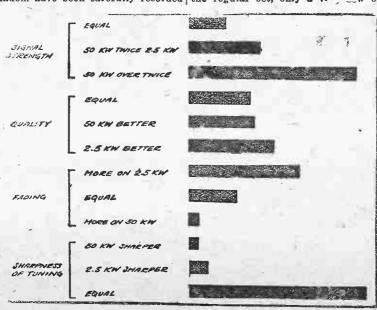
power broadcasting have been trans- public in each case. on the more recent transmissions are the transmission. not vet sufficiently digested to be in- | Most of the letters state that the

random have been carefully recorded the regular set, only a very few

Now that several schedules of super- | show the true general feeling of the

mitted, the following statement by In drawing conclusions from such the radio engineers of the General a test it must be remembered that Electric Company will be of consider- there are naturally many conflicting able interest to those who are fol- reports. Some listeners may have lowing this recent development. Care- peculiarly bad locations and others ful conclusions are given based on good ones, so that their observations the first tests which were carried out conflict with the average. But the at the request of the United States average is, nevertheless, the best Department of Commerce. The data index of the general satisfaction with

super-power was more than twice Some thousands of letters were re- as loud as the ordinary power, and eived by the company on the tests a number have been received where of August 22, 24 and 25, and they the increase was ten to one. Thirty have been of great assistance in per- per cent of the reports say that there mitting a careful analysis of the is no choice between the two in qualvalue of super-power in furthering ity, and the remainder are fairly the cause of a universal broadcast evenly split in favor of one or the service. It is hoped that the listen- other transmission. Fading is shown ers will respond as helpfully in to have had much less effect on the further series of tests. Their co- high power. Reports on the sharpoperation is essential in improving ness of tuning are practically unanimous in showing that it was just as Fifteen hundred letters selected at easy to tune out the high power as



by dividing them into groups, follow- | the letters complaining of any partment of Commerce. All state power. ments of signal strength, for example, were separated into three groups according to whether they reorting the 2.5 kw. quality better by skilled design of transmitters. and those reporting equal quality.

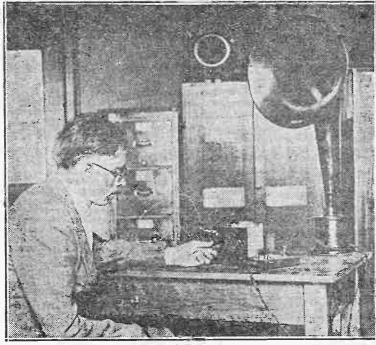
Fading, sharpness of tuning and the answers to the other questions were us reports of our transmissions so counted and averages taken to at the South Schenectady laboratory

ng the method suggested by the De- "blanketing effect" due to the high

groups according to whether they re- the signals at a distance without unported the 50 kw. equal to the 2.5 kw. or stations near the transmitter. This the 50 kw. signal more than twice represents a real advance in the art Quality reports were of broadcasting. And the quality of porting the 50 kw. better, those renights of test can be made perfect

divided in a similar way. Then all that we may make the best use of the letters in each group were our extensive developmental facilities

#### Crystal Set Operates Speaker



This picture shows Morris S. Strock, of the Radio Laboratory of the Bureau of Standards, Washington, demonstrating a crystal set developed by the bureau that will operate a loud speaker

A Compact B Eliminator A compact B battery eliminator **BRACH** Extension een placed on the market by A. H. **Cord Connectors** Wasge, 6 Reade Street, this city. The

Radio Booklet for Amateurs "Enter Your Radio World" is the which is but six inches square has title of a pocket size booklet pwolished by Charles W. Down, of 711 levice, which is known as the Waage-B-Eliminator, is supplied in two has had a great deal of experience in Use the Radio Exchange Colstyles, one for alternating current installing and repairing radio receivand one for direct current. The di- ers. The booklet contains a digest of ect current instrument is complete it itself and the alternating current this experience which should be helptype requires a 201 A tube to rectify ful to all radio amateurs. A number e curren . Both types are guaran- of well arranged radio log sheets are



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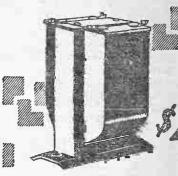
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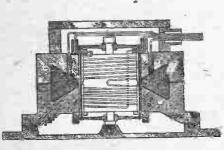
## Combined Wireless and Submarine Signaling in Ship Navigation

The Fessenden Oscillator Helps the Navigator Locate the Position of His Vessel in a Fog

By A. DINSDALE Member of the Radio Society of Great Britain

HROUGHOUT the history of navi- [ which, owing to the strength of their | sound signals are used simultaneously and [ counteract the dangers of navigating near coasts by installing warning devices at or near, the most dangerous points. Thus we have lighthouses and lightships all around

In foggy weather, however, a light cannot be seen, so for centuries it has been the custom during the prevalence of such weather to sound some form of foghorn. Now it has been found that sound waves traveling through air are subject to all



Cross-section diagram of the Fessenden

sorts of freakish variations, and have proved thoroughly unreliable, particularly when it comes to estimating, in fog, the true direction from which the sound

Faced with such a situation, inventors, long before wireless was thought of, devised or attempted to devise some method of projecting sound waves through the water. Not only is water a more stable and reliable medium for the transmission of sound waves, but it transmits sound many times faster than does air.

Submarine signalling, as the projection of sound waves through water is called, has continued to be developed till at the present time it is fairly highly perfected. By means of it ships in the vicinity of lightships may listen for the submarine signals sent out by it and roughly determine their position. This is done by fitting one sound receiver, or pick-up device, on each bow of the ship, and by comparing the relative strength of signals received from each side some idea of the bearing of the light-vessel can be obtained.

This method is only very approximate, however, and can only be used at a range of a few miles. Some idea of distance can also be obtained, but only by rough

#### The Radio Compass

Such was the position when the wireless direction finder, or radio compass, was invented. This instrument is undoubtedly one of the greatest aids to navigation that has ever been invented since the discovery of the magnetic compass. By its use it is possible to determine accurately and without any other means, the position of a ship in the densest fog, and that at ranges

This is done by taking bearings of two or more coastal stations whose positions are known. Lines representing these bearings are then drawn on the chart, through the positions of the coastal stations made use of, and where these lines intersect is the position of the ship con-

This is only one of the uses to which the radio compass may be utilized. When in mid-ocean, in fog or other bad weather conditions which might give rise to a colwireless signals, are suspected of being

Similarly, in the case of a ship in distress which has sent out the wrong position, it is a simple matter to swing the radio compass on her and steer straight up to her, thus saving much valuable time which, prior to the invention of the direction finder, was wasted in searching for the distressed vessel in the vicinity of the

Ships heading for seaports frequently have to make turns round headlands or shoals in the vicinity of the coast, and it is at such points that lightships are usually placed. Besides being fitted with submarine signalling apparatus, such vesin conjunction with each other for the purpose of measuring distance.

Readers are well aware that wireless, or radio, signals travel with the speed of light, which, for all practical purposes, is instantaneously. Sound signals in sea water, on the other hand, take 1.3 seconds to travel one mile, so that, as a mariner can hear the arrival at his ship of the submarine signal, all that is necessary is to provide some means of informing him precisely when it left the lightship. By dividing the time interval (in seconds) between the transmission and reception of the signal by 1.3 the distance in miles may be determined.

Wireless signaling is the method em-

signals, which take the form of a series of about twenty dots, sent at intervals of 1.3 seconds.

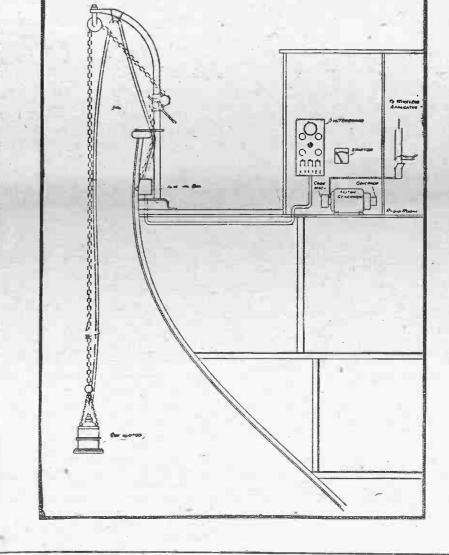
The operator naturally begins to hear the series first, and he counts the number of dots he hears. Immediately the navigator hears the first dot of the series, on his submarine signaling receiver, he signals the operator, who then informs the navigator how many dots he heard before receiving the signal from the bridge. This number of dots represents, in miles, the vessel's distance from the lightship.

Thus the bearing of the lightship and the distance from it are both known, and the exact position of the incoming steamer may be plotted on the chart. Subsequent observations can be made at frequent intervals and the ship's course checked to see if it is being affected by tide or ocean currents.

The importance of such observations will be readily appreciated when it is realized that steamers generally have to alter course after passing a lightship, and in clear weather the necessary observations are made visually. Those readers who have ever driven an automobile in a thick fog and missed that vital turning off the main highway will understand the position thoroughly.

#### Progress of the System.

These latest developments in combined wireless and submarine signaling have been adopted mostly in Europe, where the following four lightships have been



A complete lay-out of apparatus showing the controlling units

power wireless transmitters, and when a fog comes up these transmitters are caused o transmit continuously and automatially some characteristic signal, or group of signals, so that ships fitted with radio ompasses can take bearings at any time and find out if they are steering the

Like subamrine signaling apparatus, the radio compass has the disadvantage of not being able to tell exactly the distance between the ship using it and the wireless transmitter of which bearings are being taken. A skilled operator can, however, form a very fair idea of the distance, provided he is familiar with the particular transmitter under observation. An approximate idea is better than none

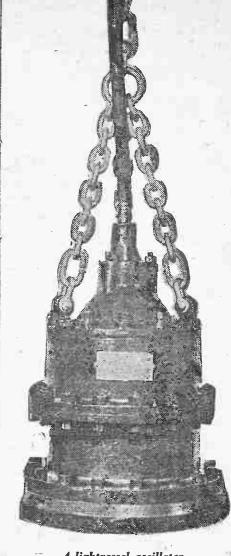
at all, but wireless engineers have been engaged for some time in trying to find some way of measuring distance exactly, and no doubt this problem will be solved some day. Meanwhile, in an effort to still further assist mariners, a plan has been evolved whereby wireless and submarine

sels are now being equipped with low- I ployed to inform the mariner of the time of departure of the submarine signal, the method being known as synchronous signaling. Simply defined, synchronous signaling is the simultaneous transmission of the same signal through two or more different conducting media, the media in this case being the ether and the sea.

#### Method of Operation

The method employed for determining both the bearing and distance from a lightship is for the latter to transmit, first, a series of prearranged signals, which serve not only to identify the transmitter, but also for simultaneous bearing observations to be taken by both the navigator and the wireless operator.

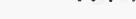
The navigator's bearings are, of course, only approximate, and, with a radio compass on board, serve little useful purpose. When the operator has completed his observations he informs the navigating bridge to that effect, and both navigator and operator listen together on their respective instruments for the succeeding



A lightvessel oscillator

equipped: The Gyedser Rev. Lightvessel off the Baltic coast; the Graa Dyb Lightressel, off the North Sea coast of Denmark; the Borkum Riff Lightvessel, off the entrance to the River Ems. Germany. and the Maas Lightvessel, anchored off the

(Continued on page four)



### Combined Wireless and Submarine Signals

Holland.

On the American side of the Atlantic there is only one lightship fitted so far, and that is the Nantucket Lightvessel. As Nantucket is the first fixed point to be made for by trans-Atlantic shipping, its special importance will be readily under-

Readers are more or less familiar with radio transmitters in general, but it may be of interest to outline briefly the history of submarine signaling, and the state of its development to-day, particularly as it owes a great deal of its present success to the genius of an American inventor, Professor R. A. Fessenden.

naling were made nearly 100 years ago by Colladon and Sturm. These gentlemen succeeded in hearing the striking of a submerged bell across Lake Geneva, but, until comparatively recently, little advance was made over this method of communication.

One of the greatest difficulties in the way of long-range submarine signaling lies in the fact that water is practically incompressible, but in order to propagate sound waves through any medium it is necessary to set up compressional waves, or strains. To do this in water requires a wast amount of power, which was not available in convenient form till electricity became available in practical form, and modern developments in its application enabled Fessenden to solve the problem suc-

The principle followed by all inventors who have tackled the problem electrically. is to arrange for some form of submerged diaphragm to be vibrated by the intermittent magnetic field of a powerful electromagnet fed with alternating current of chosen frequency.

known as oscillators, and the general form taken by the Fessenden oscillator is shown in the figure. A powerful ring-shaped electro-magnet is mounted around a cen- heavy apparatus of this type so that it

(Continued from page three)

tral core, and in the annular space be- | will respond to alternating currents havtween the magnet and the core is located the moving part, or diaphragm, which in this case is a copper tube. Owing to the particular design and arrangement of these parts, the tube acts as a closed secondary to the core winding.

The ring magnet, when energized, produces an intense magnetic flux, amounting to over 15,000 lines of force per square centimeter. The magnetic circuit is from one pole the ring magnet across the air gap (which contains the upper part of the copper tube diaphragm), through the central fixed armature, across the other air gap to the lower pole face of the ring mag-The first experiments in submarine sig- net, and back to the upper pole face through the yoke of the magnet.

In operation direct current is continuously applied to the winding of the ring magnet from a 4-kw. dynamo, and signaling is accomplished by switching on to the winding of the central stationary armature a powerful alternating current having a frequency of about 500 cycles.

This alternating current induces a similar current in the copper tube, which, being free to move, vibrates in the field set up by the ring magnet. This vibration transmits a rapid in-and-out motion to a metallic diaphragm which is attached to the tube. This latter diaphragm is made of steel, five-eighths of an inch thick, and forms the base of the oscillator.

The whole apparatus is lowered in the water to a depth of twenty-five or thirty feet on the end of a chain, and with it goes an armored cable which carries the current supply.

#### Considerations of Operation

The complete appartus weighs about 100 pounds, which is comparatively light when the power applied to it, which is Devices operating along these lines are necessary to overcome inertia of parts and, particularly, the strain of transmitting compressional strains to the water is taken into consideration. To construct

ing a frequency of 500 cycles is no simple

A frequency so high as this is necessary in order that the signal as received by listening ships may have a distinctive high note, which can be easily identified through interference from extraneous noises, and, particularly, the wash of water against a ship's side. Observations of submarine signals are always taken with the ship going full speed, unless she is slowed down for some reason or other, and the noise made by water passing over the receiving diaphragms is surprisingly

These receiving diaphragms consist of circular plates fitted one on either bow, well below the water line, and connected up, through a sensitive detecting device, to the navigating bridge. The navigator listens for the signals with a pair of telephone receivers, one being connected up to the diaphragm on the port bow, and the other to that on the starboard bow.

If the ship is heading direct for the source of the signals they will be equally strong in each phone, but if she is inclined at an angle to the source, the signals will be received louder in that phone which is connected to the receiving diaphragm

The detecting apparatus is very similar to the oscillator, only it is built on a lighter scale. The sound waves striking the pick-up diaphragm cause it to vibrate, and these vibrations are transmitted to the copper tube. The vibrations of the latter within the magnetic field set up currents in the central core winding which may be heard in a pair of telephones. Considering the heavy nature of the parts, it is indeed surprising that they will respond to such minute sound vibrations.

Besides being of value for warning ships of their approach to dangerous spots and its value in conjunction with wireless for measuring distance, submarine signalling

For the two purposes mentioned above. prearranged signals are sent out at regular intervals of a few minutes, automatically, but the apparatus can also be used for intercommunication between ships by means of the Morse code, the operating key being placed for this purpose in the

The ordinary average range of the Fessenden oscillator, with a ship going full speed, is between twenty and thirty miles, or more if the ship is stopped, thus silencing interfering noises from the wash of the waves, the throb of the propellors and the beat of the engines.

Another use to which the submarine oscillator is put by the United States Navy ice patrol ships is that of locating icebergs which drift down annually on to the Atlantic steamer lanes. For this purpose oscillator impulses are sent out and immediately listened for. If such impulses should strike an iceberg the sound waves will be reflected back to the transmitting source again, and the listener, by timing the interval between the emitted signal and its return to the origin, may calculate the distance between himself and the ice-

In addition to its adaptability to telegraph communication, the submarine oscillator can also be used, at very short ranges, for telephonic communication. The method is not nearly so perfect or satisfactory as the radiophone, of course, but intelligible speech can be transmitted and

In conclusion, it is interesting to note that, although the practical range of submarine oscillators is not very great, the French Hydrographic Service, in the course of experiments, proved that the explosion of a depth charge weighing one kilogram can be heard under water at a distance of over 200 miles.

Thus it may not be long before ships, by combining submarine signalling with radio compass bearings, will be able to determine their position when still more than half a day's run from land.

#### **Broadcast Listeners Cause 50%** Of Preventable Interference

The Canadian Department of Marine and Fisheries Sends Circular Letter Instructing Fans on the Operation of Regenerative Sets

The following circular letter, addressed to Canadian broadcast listeners and prepared by the Canadian Department of Marine and Fisheries, should be of interest to American listeners, as it tells how to operate a regenerative receiver without causing interference.

RECENT departmental survey of radio broadcast reception conditions in the more populated centers in the Dominion of Canada indicates that approximately 50 per cent of the "preventable interference" which prevails is caused through the incorrect operation of regenerative receiving sets by the broadcast listeners

The survey further indicates that most of this interference is due to a lack of knowledge of correct methods of adjusting a regenerative receiving set, and it is accordingly hoped that a material reduction in the same may be effected if the broadcast listeners can be persuaded to co-operate in an endeavor to clear the air of regenerative whistles, and with this end in view the following instructions for operating this class of receiving set have been drafted.

The principle of regeneration as used in radio receiving sets is that interference produced by some other the part of the output of the detector oscillating receiving set in the neighvacuum tube feeds back into its own borhood. input and thus greatly increases the Many so-called non-radiating re-

volume of the signal. ceiving set from the transmitting Make it your business to see that station travel down the aerial wire your set is not causing trouble. through the primary coil in the set If you are in doubt as to whether

circuit of this tube is fed back in annoyance: such a manner as to set up a "field" or influence in the part of the circuit and ask him to listen in on a particuof the detector tube.

What Is Oscillation? ing sets. Regeneration should there- ate without causing this interference.

fore never be allowed to proceed to this point, as it then constitutes a If you will take the trouble to obtion is not always described by this joyment from your radio receiving

name and the dial which controls this set, and at the same time cause minfeature of the equipment may be imum annoyance to your neighbors. designated by any of the following (1) Practice on tuning powerful terms: Regeneration, amplification, stations first, and do not try to pick reaction, varind, tickler, sensitivity up weak distant stations until you and feed-back.

When a radio receiving set in a state of oscillation is being tuned to the regeneration control and the a broadcasting station:

1. It causes whistles in radio receiving sets of all types which are always just below the point of osciltuned to the same station; this in- lation, your set is then in the most terference may be heard up to a dis- sensitive condition. This is the reason tance of several miles.

2. It distorts the quality of your 3. It uses more B battery power regeneration control at once.

and, therefore, the life of the B battery is reduced. 4. It tends to reduce the life of

the detector tube. When a radio receiving set, in a

to a broadcast station it is said to be in the state of zero beat. This distorts the broadcast reception and also interferes with neighboring receiving sets which are tuned to the same station.

In a word, regeneration carried to oscillation causes great annoyance to your neighbors, poor reception and tant station on your receiving set expense to yourself, and has no advantages whatever.

Do You Cause Interference? may make the following test:

fixed position, slowly rotate the tun- wiggle your dials, for in so doing ing dial, and note particularly the you may be causing annoyance to change in sound of the whistle. If some other broadcast listener who the whistle rises and lowers in pitch would otherwise be able to receive sympathetically with the movement this distant station on a multi-tube of your tuning dial it indicates that receiving set. your receiving set is in a state of You can accordingly assist in elimoscillation and probably causing in- inating these whistles by: terference to other sets. On the other (a) Learning to operate correctly hand, if the whistle does not change yourself. in pitch corresponding to each move- (b) Not allowing children who are ment of your tuning dial, but simply not old enough to understand the corvaries in volume, the whistle is not rect method of operation, to cause caused by your receiving set, but is interference from your set.

ceivers will, under certain conditions, The electric waves reaching the re- radiate and thus cause interference.

and so to earth down the ground wire. your set can cause interference, you The weak electric current resulting can check the same by making the from this influences the vacuum tube following test, but be careful to do in such a way as to set it functioning. so at a time when only a few persons The resulting output from the plate are listening in, so as not to cause Call a neighbor on the telephone

connected to the input (the grid) of lar station at a prearranged time, and the tube. This "field" induces in the then tune your own set to the same input circuit a current of electricity station. Turn up your detector tube of the same frequency as that of the flament to normal and put the rereceived electric waves. The energy, generation control to its maximum; therefore, which comes down the an- move your tuning dial five times tenna wire is automatically strength- slowly across the point corresponding ened by an impulse from the output to the tuning of that station, then telephone your neighbor and ask him if he heard the interference corre-Unless controlled this action will sponding to these five movements of continue until the saturation point or the dial on your receiving set. If he climax is reached, the tube being then heard your interference, the probabilsaid to be in a state of oscillation. ity is that hundreds of others also When a receiving set is in oscillation have been annoyed at times by radiait causes howling and squealing in tion from your receiving set. You your own and your neighbor's receiv- should therefore learn how to oper-

How to Adjust a Set serve the rules which follow you will On commercial receivers regenera- obtain greater satisfaction and en-

> become expert. (2) Use both hands, one hand for other hand for the tuning control.

> (3) Keep the regeneration control for using your two hands for tuning. (4) If your set then accidentally breaks into oscillation, turn back the

(5) Do not try to find a station l the "whistle." If your set is tuned just below the whistling point, the signals will come in clear and your regeneration control can then be state of oscillation, is exactly tuned tuned a little further to increase the volume.

> volume from a set not designed for (7) Do not force regeneration in

> an attempt to hear stations beyond the range of your set. The fact that you once heard a dis-

is no indication that you can hear this station regularly, for occasionally a radio broadcast from a distant The interfering whistle which you station is received with extra hear in your receiving set may origi- strength due to some freak condinate in your own set, or it may be tion. When you have tried to tune interference caused by your neighbor. in a station in the correct manner In order to determine this point you for a minute or two and are not able to hear it, do not unduly increase Leave the regeneration control in a your regeneration and persistently

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### Bob, the Boy Radio Fiend, Lays a the girl's head and chopped off his own,"

says I, trying to keep my teeth from chat-

"Any room suits me," says Yaller cheerfully, and I could have kicked him for his chipperness.

You could see that no one had lived in the house for a long time for the dust lay thick on the cellar stairs and in the living room. We didn't investigate the rest of the house. I was too scared to suggest it, and I hoped Yaller was too.

I had brought along a supply of corn silk and papers and rolled myself some cigarets and offered Yaller some. Yaller had brought along a radio magazine to read to pass the time.

Well we must have smoked and talked for a long time for it gradually got dark and I lighted the candle and stuck it in an empty milk bottle.

After a while I said I felt kinder sleepy. Yaller said he was too. So we unrolled our blankets and took off our shoes and stockings. That was Yaller's idea and I didn't want to let him see I was afraid to.

"Shall I blow out the candle?" says I. "Might as well leave it lit," says he, and then we both flopped down side by side.

#### A Jreadful Yell

We must have talked ourselves to sleep, for the last thing I remembered was Yaller asking me if I was scared yet, and I said: "No, are you?" And he says something that I didn't catch.

I don't know how long I slept, but I was suddenly awakened by the most unearthly scream of terror that fairly chilled me through and through.

As I lept to my feet half awake it was to find myself in dense darkness for the candle had either burned out or been blown out. I reached down to feel for Yaller, but he wasn't there.

patter over the bare floor as he was making a mad dash for the front door.

Then I heard his bare feet go pitter- | less man in the dark I frantically searched for a match. As I did so there came a weird sound that made me gasp with

I own up I was scared too and as I | fright, and forgetting all about a match cidn't want to go bumping into any head- | I made a plunge for where I thought the

### How Ward Fry Wins a Prize

(Continued from page two)

up this contest an' see who wins.'

The Contest Ends. shoulders, like this, you know, an' sez, "'Tain't my fault if the lamp broke. Some fellers don't know how ter operate a radio noways. My lamps is part of my set an' you can't ast me ter lend my set ter this yere feller, kin you?' I knowed Dunning an' so did the rest of the fellers, an' so everybody gits up disgusted an' starts ter go ter home. 'Wait a minute,' Dunning shouts out, 'This yere feller, Ward Fry, he lost an' he's got ter make an apology right now.' Well, the audience an' jedges took sides an' all you could see was arms an' fists aswinging an' landing, now an' then, on some feller's jar. I 'sprised the old woman by knocking out Dunning, even tho he is twicet as big as I am. I found her cheerin' an' wavin' my coat an' hat up in the air an' we walks outa the hall with a big crowd cheerin' us alla down Main Street.

"Now acourse you understand I really won thet radio contest and shud hev gotten the prize an' all thet. It warn't my fault one of them lamps was defective an' burnt out, so I cudn't hear Chickago, or somethin' futher away. Folks all knowed thet an' I got the laugh on Dunningthet's what counts. He ain't so dam smart these days, an' he never talks 'bout radio to nobody anymore.

#### The Newspaper Report

"But this feller Dunning is a slick one, an' he tells Rogers thet if I git thet prize

be a sport you'll lend one of yorn ter finish | he'll tell his brother, who's a lawyer, an' hev us all arrested fer conspiritin' agin him. An' so Iguess Rogers is afeared ter do anythin' with the prize. He tells me | the door jamb and had been knocked un-"But Dunning knew dam well who that he lost it in the fight that night at the conscious. There was a gash in his head would win, so he sets ther an' shrugs his contest, an' mebbe he did at that, you from which the blood was oozing can't tell, you know. But anyways, I got my pitcher took in Scranton, an' the 'Gouldsboro Weekly Trumpet' printed it on the first page! An' along with it they puts a piece all bout the contest, how the lamp wore out, an' all 'bout the big fight. They sez, 'Ward Fry was the knockout of the evenin'. Gouldsboro an' Mummyville is proud of him an' his inventions. He won. most folks think. But owing ter the fact thet Jedge Charley Smith has went away frum town since he got outa the hospital. there's a deadlock twixt the jedges as ter who won, an' nobody knows which side Smith wuz fightin' on, an' when ast he sed he didn't know hisself.' Lemme see they sed somethin' else, but thet's all I memarized. Jes' a minute an' I'll go upstairs an' hunt up the paper fer you an' show you my pitcher an' then"-

Ward Fry was interrupted just at that moment by the ringing of the telephone, and I saw an opportunity to break away, and incidentally get my dinner. But he noticed my maneuvers toward the door and commanded me to "wait a minute."

He kept his word and was back again in considerably less time than I had expected a rural telephone call would take. "Waddye think," he exclaimed in a nexcited voice. "I'm gonna git thet there prize! Rogers jes found out thet Dunning ain't got no lawyer brother-in fact, he ain't got no brothers at all!"

I thought it was Yaller and made a

grab for him and was punched on the jaw and knocked down. That made me mad and I made a flying tackle for his feet and we both came down with a crash. As we struck the floor there piled into the room Billy Rich and about a dozen other fellers all with lighted lanterns and with them was Yaller in his bare feet.

As I saw Yaller I gasped, "What the heck!" And then I looked down at the feller I had tackled, thinking I was seeing

I wasn't though for he was a stranger to me. He had struck his head against

"Great guns! It's 'Louie the Blood,' " gasped a man's voice.

I turned and there was Officer Britt. the cop. He had heard the racket and had investigated. He snapped the handcuffs on the unconscious man and sent one of the boys for the nearest doctor.

#### They Figure It Out

Afterward me and Billy put two and two together and figured it all out. There was no ghost after all. What had sent Yaller screaming out of the house was my bare feet. I never could sleep in one place but was always all over the bed, and when Yaller felt my cold feet alight on his face; well you know what happened.

As for "Louis the Blood"-it was him all sight—he had just camped out in the haunted house until the excitement of his escape had died down. He had heard of the house being haunted and to help it. along had fixed up an old radio set he had found in the attic so it would receive static if nothing else.

That was what folks heard who passed the house at midnight, just plain static, and it had scared even me, a died in the

But that \$500 reward compensated me for being scared all right, and anyway I proved I was braver than Yaller and he had to fork over his new five-tube set to me. The only unfortunate part of the affair was that Dad made me put the \$500 reward money in the savings bank.



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#### Radio Announcers Of America Elect **Board of Governors**

Keen interest was displayed when the first announcement of the board of governors of the Radio Announcers of America was made at the Radio World's Fair recently held in New York. The board is made up of the following: Bob Emery, of WEEI, Boston; G. V. Willets, of WRNY, New York; George S. Cruger, of WOO. Philadelphia; Lambdin Kay, of WSB, Atlanta; Harold Hough, of WBAP, Fort Worth; John Daggett, of KHG, Los Angeles; Richard V. Haller, of KGW, Portland; Corley W. Kirby, of WWJ; Detroit; Charles Burke, of WHT, Chicago, and A. W. Ryan, of CNRO, Ottawa.

Membership in the Radio Announce ers of America is limited to persons of good standing, citizens of the United States of America or the Doannouncers or alternates of a listed broadcasting station, or those persons or corporations owning or operating a listed radio broadcasting station within the United States or Canada and directors of these stations.

Members are to be elected by the board of governors, which also has of the association. It is to make

How much radio is indebted to the younger generation was indicated re-

which I want to make a special

they came to us by dozens and wrote to us by thousands. Naturally, most United States. them were going over plowed Dr. John Gabbert Bowman, chan- Zurich. is, and you may be sure their re. Moments." wards will be great. Most fortunate.

en so wonderful that I often won- the KDKA evening program. 'Encourage youth and it will serve.'

Laughing Song," Requested

Song," and it will be given in com- follow these two lines. pliance with their requests. "Roll On Silver Moon," another before the maining nights, one will be devoted It was Mr. McClatchie who arwar song; "Good-by, Eliza Jane," to readings from standard authors, ranged for rebroadcasting of KDKA "Me and My Pardner" and "Oh while another night will be used for programs by the Stuttgart station, Didn't He Ramble," a popular song a current events forum. Friday night the programs being relayed by the of twenty-five years ago, are included will be held, as a rule, for special station's international short wave

#### 23 Stations to Send News on World Series

The world series games, be-ginning October 7, will be de-scribed by Graham McNamee through the WEAF chain of stations as follows: WEAF, New York; WJAR, Providence, R. I.; WEEI, Boston; WTIC, Hartford, Mass.; WOO, Philadelphia; WCAE, Pittsburgh; WCAP, Washington; WCTS, Worcester, Mass.; WGY, Schenectady, N. Y.; WGN, Chicago; KDKA, Pittsburgh, and WMAQ, Chicago. On October 10 and 11 station WSAI, Cincinnati,

will be added to the list. Among other stations broad easting these games are KSD, St. Louis; WPG, Atlantic City, N. J.; WJZ, New York City; WOR, Newark, N. J.; WRC, Washington; WGBS, New York City, and WNYC Yew York City; WWJ, Detroit;

### KDKA to Open

By Mary Frances Philput Manager University of Pittsburgh

"The Campus of the Seven-League every corner of the civilized globe. control of the management of affairs Boots," though sounding somewhat radio an even more perfect form of is, as a matter of fact, merely a entertainment that the Association twentieth century reality, the most of Radio Announcers of America has extraordinary part about it being ably no radio set had ever been. been formed. Its chief aim is to that any one may be "on" this campus raise broadcasting and announcing to simply for the wishing. And, mind central unit, through which literature you, the boots that such a campusmay be distributed, and in general in point, the one at the University mile. Here I found far better recepto act as a source of guidance and of Pittsburgh-dons are light fairy tion conditions than I ever had expeimprovement to the radio announcers things, invisible, traveling through rienced in summer weather. On two around the world!

hey have done wonders. If every single talk, it would be quite a com- we have in Stuttgart in winter. company has had as much of its prog- mon occurrence to find that on one "I next listened in for four nights

ground, but not all of them. Some of cellor of the University of Pitts- "On the third night reception was

Following the opening night pro- silence." lough, is the public, because the grams will be put on the air from eal fruits of all radio development 7:45 to 8 every night in the week except Saturday and Sunday. These o to them.

"Our experience with youth has are broadcast as a regular part of the KDKA evening program.

the KDKA evening program.

Building on a framework of a changed to read something like this: cational features" for KDKA, the university has arranged its programs American cities during summer. Never knowingly would we do any-Never knowingly would we do anything which would hurt the spirit, the enthusiasm of any youngster. A little patience, a little understanding brings forth fine results from these young men. If they are granted this young men. If they are granted this they never know when they are they are discussions of literature, music, art discussions of literature. The music are the state of the sta licked. No problem confounds them.
And that is the spirit which makes ample, a series of talks on Greek ampl philosophy—the professor called the series "Conversations With a Phi- great height brought no improvement By Children in Program cess. Then, in the second place, there though my aerial was practically over lar by "Dusty," the barytone of "The is the material of a so-called more the very tip of the mountain and practical nature which has a wide a very good ground was available. Gold Dust Twins," and "Dolcey appeal. In this category are talks Distant stations were heard no louder Stephen C. Foster, will be the vocalnlied fields, talks, indeed, on every features on their program on Tues-subject in which there is current inday at 8:30 p. m. from WEAF and terest and a consequent eagerness of the Jungfrau and Lauterbrunnereight other stations—WEEI, WFI, on the part of people to get hold of WCAE, WGR, WWJ, WOC, WJAR facts which will help in forming influence of the snow-covered peaks. Hundreds of requests, many of ions. At the university studio two the places where he rigged up his

> Occupying the periods for the re- are absorbed by the peaks above. features.

#### Radio Listener in Switzerland Finds Alps Staticless

Did you ever hear of a location which in mid-summer is free of one may listen in on distant stations as undisturbed by this pest of radio reception as on the most favorable winter night?

Such a Utopian place actually exists, one of the European observers of Westinghouse Station KDKA has reported to the station.

and on October 11 station WLW The place is on the slope of the famous Jungfrau Mountain, in Switzerland, a peak of the Bernese Oberland Mountains which towers nearly three miles toward the sky.

This snow-capped mountain is one of the show places of the Swiss Alps, and a good view of it may be had from Interlaken.

Another place where the "grinder"

variety of mid-summer static is seldom found is on a shelf of the Lauterbrunnertal, another Swiss peak. The discoverer of these static-free spots is Stanley McClatchie, an American electrical engineer, who is living in Stuttgart and who is one of the large group of regular observers who report to KDKA on the reception

and the property, funds and finances like an inverted Arabian Nights tale in mid-summer and tried out recep-

space and carrying their load right of the five nights the air was prac-Radio Progress All this is but to say that the Uni- of any consequence could be heard versity of Pittsburgh radio studio. so clearly that speech was quite unently in a public address by Edward in co-operation with Station KDKA, derstandable. This is saying a great H. Jewett, president of the Jewett has extended its campus not only deal when one considers that dis-Radio and Phonograph Company. over the whole of the United States and that European stations have noislands of the Pacific, to Europe and stations possess, regardless of the of this land, the youngsters and 'kids' betical lists were to be prepared on was not as clear as these other two, the lighter side of twenty-five the basis of letters received from any but still was nearly equal to what

then truly radio is eternally indebted side of you had sat a radio classmate in Kleine Scheidegg, in the lap of in Glasgow, Scotland, while on the and a quarter. The broadcast sta-"Long ago we made it a rule never other side had been some one in tions of Europe stood out clear cut o turn down a youngster who thought Porto Rico, "you" standing for any against a silent background. It was he had an idea. This got about, and one in any corner of any state in the an almost uncanny experience. I was

the best ideas we have utilized in our burgh, will open the 1925-'26 season slightly marred by occasional cracks, products have come from such young- of broadcasting from the university but the ruinous 'grinder' variety of sters as these I tell you of, and I am studio on Monday evening, October 5, around the sunset period. Sunset standing features of our new receiv- by speaking to the members, new and brought with it moderate static disng set are due wholly to them. We old, of the "Campus of the Seven turbances, but these gradually disapere fortunate in drawing them to League Boots' on the subject, "Spare peared as the evening advanced; by

Mr. McClatchie later tried recepbut static here, in contrast to condiwill be served, ought not to be year's experience in providing "edu-

"This peak (Mount Niesen) is at not worth while listening to any sta-

"I was surprised to find that the losopher"-met with enormous suc- in the strength of the signals, al-

judgments and in crystalizing opin- which tower more than a mile above them from children, have asked for nights a week have accordingly been receiver. Lightning never strikes at the repetition of the "Laughing set aside for a series of talks that will Scheidegg, Mr. McClatchie learned;

relay system.

### Up-to-the-Minute News of Kadio in Pictures



### Measuring the High Frequency Resistance and Distributed Capacity of Coils

Determining These Characteristics of Inductances Is Simpler Than Generally Supposed

By WILLIAM H. FORTING TON

era. That is at least the term applied to designate the quality of certain inductances and condensers. The number of low loss coils available to the public to-day is legion, and for some obscure reason the serious minded experimenter seems to be returning to the old time form of coil construction, which, as every one remembers, was the fiber tube, with the coil wound upon it, constituting what is generally known as a solenoid.

The solenoid may be regarded as the parent and standard of all inductances. This is borne out by the fact that com-

E ARE now living in a low loss | a known frequency is to be measured, G | is used. In such a case the results ob- | pursuance of high frequency measurea thermocouple galvanometer or hot-wire tained will be absolutely fallacious. milliammeter used as an indicator of the resonance point of the two circuits. C a variable condenser of approximately .001 microfarad, R a variable resistance.

> low losses at the frequency to be measured, and should be selected with great care by the experimenter. The writer uses an excellent condenser of the grounded rotor low loss type, whose stator plates are supported on isolantite insulators, and whose losses are practically immeasurable until the extremely high fre- | value of the resistance R then equals the

The condenser C must have extremely

After a record is taken of the amount of current flowing in the test circuit the resistance R is then substituted for the coil X, and the capacity of the condenser C varied, thereby retuning the circuit until the resonance point is again reached as indicated by the galvanometer. The resistance R is then varied until the same deflection on the meter is obtained as when the coil X was in circuit in place of the

The amount of energy flowing in the test circuit is then equal to the previous amount as indicated by the meter. The

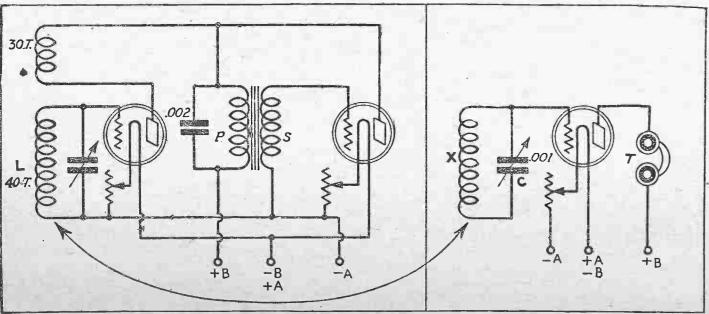


Figure 2—The wiring diagram of the oscillator to be used for measuring the distributed capacity of an inductance petent electrical and research bodies accept this form of winding for their standard of inductance. It is the intention of the writer to present to the experimenter two reliable means of two equally essential high frequency measurements rather than make a qualitative analysis of the various coils available. An efficient inductance might be defined as a coil having a high inductance value, when compared with its resistance at all frequencies. The absorpwithin a very short length, tion due to dielectric losses and the distributed capacity should be reduced to a

frequency also increases. This is perhaps the most important factor to be considered in designing an efficient coil. The measurement of high frequency regenerally supposed, providing certain precautions are exercised during such measurements. Perhaps the best known method of high frequency resistance, measurements consistent with a fair amount of accuracy and ease of applica-

minimum. It is common knowledge that

as the frequency of the induced cavent in

a coil is increased, the resistance to that

method. Figure 1 represents schematically the set-up required for measurement of the high frequency resistance of a coil. V is a radio frequency oscillator, or vacuum tube hetrodyne wave meter, delivering a radio frequency output of about five watts at a known wave length or frequency which might be for all practical purposes 200 meters, which is equal to 1,500,000

tion. is the use of the pliotron or vacuum

tube oscillator, whose application to radio

frequency measurements is many and

varied. This is more generally known as

the substitution or direct comparison

This oscillator may take the form of a simple single circuit regenerator, provided of course the circuit delivers an output of sufficient power. L is the coupling

evcles per second.

quencies are reached. The resistance R must also meet some stringent requirements. Its inductance value must be immeasurable and should have no inherent shunting capacity across it. Its resistance at all frequencies must be constant. It will be seen by these requirements that this resistance must take the form of a short piece of extremely fine high resistance wire having a high ohmic resistance

#### The Measurement of Resistance

The oscillator V is set in action at a known frequency and the inductance L coupled to the coupling coil of the oscillator. The condenser C is varied until the galvanometer indicates a miximum current deflection, which will be of course at the

resistance of the inductance X at the frequency measured.

The energy transference from the oscillator to the other circuit must only take place through the inductance L. For this reason it is desirable to shield the rest of the circuit from any inductive coupling which may take place from the oscillator. On no account must there be any stray coupling between X and the oscillator V The circuit may be screened by a metal plate or a gauze screen surrounding the circuit, leaving the coil L exposed.

The inductance whose resistance is to be measured should be supported upon insulating pillars away from any surrounding objects, as the proximity of surrounding objects may in extreme cases affect the high frequency resistance of the coil.

One method of measurement of distributed capacity of inductances which is

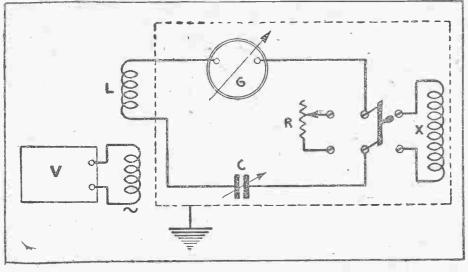


Figure 1-Set-up for measurement of the high frequency resistance of an inductance

resonance point of the two circuits. The amount of deflection upon the scale should be carefully noted, care being taken that the eye is directly in line with the needle at the time of reading.

The experimenter must not be fooled in any manner, such as obtaining a reading on the indicating instrument when the test circuit is in resonance with one of the harmonic frequencies of the oscillator. very popular among experimenters is the "wave length square" method. The writer, however, prefers the pliotron harmonic method, since the limits of accuracy are decidedly closer.

The oscillator to be used in conjunction with the measurement of distributed capacity of inductances by the writer's method should be a continuous wave oscillator delivering also a sharp note of the high frequency resistance and disaudible frequency. The circuit of such an | tributed capacity of an inductance will oscillator is shown at Figure 2. This in- be a great aid in the construction of truly coil. X the inductance whose resistance at | This is easily done if a wrong value of L | strument has many useful purposes in the | "low loss" coils.

ments. L is a coil wound on a three-inch former having forty turns. The plat? coil of the oscillator tube is composed of thirty turns of the same wire, which may be 22 double silk or double cotton covered wire, and is wound about one-fourth of an inch from the other coil on the same tube Care should be taken that the two coils are wound in the same direction.

The transformer shown in the diagram is an ordinary audio-frequency transformer having a ratio of about 31/2 to 1. The modulator tube is responsible for the production of the audible note, which may be varied by varying the filament current

After the circuit has been set up as shown in figure 2 the condenser C, which should be calibrated, is rotated until the fundamental wave length of the oscillator is heard with maximum intensity. The coupling between X and L must be fairly loose in order that the note of the oscillator is not heard over too great a section of the dial. When the fundamental wave length has been tuned in sharply and accurately, the condenser capacity reading should be noted.

### Relation to Frequency and Capacity

The condenser should then be rotated until the first harmonic of the upper frequencies of the oscillator is heard. This first higher frequency harmonic, it must be remembered, will be found upon a lower wave length. It is obvious then that the condenser capacity must be decreased. Now the value of the inductance whose distributed capacity is to be measured may be assumed constant, and since the frequency varies inversely as the square root of the capacity, it will be seen that the capacity required to tune in the harmonic is a little less than onefourth of the capacity required to tune in the fundamental frequency.

We may express this in formula as: (Kf + K) = 4 (Kh + K)Hence K = Kf — 4 Kh

Where Kf is the capacity required to tune in, the fundamental Kh is the capacity required to tune the first harmonic, and K is the parasitic on distributed capacity of the inductance under measurement. Providing the experimenter exercises sufficient care in reading his condenser capacities he will find this method to be very accurate.

### Precaution to Be Taken

The amount of coupling between the inductances will be governed by the intensity of the harmonic signal in the telephones. which will be of course much weaker than on the fundamental frequency. The same amount of coupling should be used for checking at both frequencies.

It must be understood that all factors in the circuit with the exception of the capacity of the condenser C must be kept constant during this test, as otherwise the results obtained will be somewhat erratic.

The value of obtaining these characteristics of coils will be of great aid in the designing of good inductances for radio receivers, but obtaining the actual constants of one coil is of little value. The value does, however, lie in the fact that if more than one coil has been constructed accurate comparisons may be made between the two. In this manner it is possible to distinguish a good inductance from a poor one.

A perfect coil would be one which offers no resistance to the flow of an electric current and which has no distributed capacity. In other words, its only electrical characteristic should be inductance, However, this condition is impossible for the simple reason that the substance which has no electrical resistance is vet to be discovered. Then, again, inasmuch as the turns of wire of the inductance are wound parallel, there is bound to be capacity between each turn. It is therefore easy to see the value of determining

### Schedule of Standard Frequency Signals

The Bureau of Standards transmits, twice each month, continuous wave radio signals of definitely announced frequencies, from the standardization of frequency meters (wave meters). transmitters and receivers. The signals are transmitted from the bureay's station WWV, Washington, D. C., and from station 6XBM, Stanford University, California. The complete frequency transmission included a "general call," a "standard frequency signal" and "announcements."

The schedule of standard frequency signals from both stations is as follows:

| * Time                                                              | Oct. 5 | Oct. 20 | Nov. 5 | Nov. 20 | Dec. 5 | Dec. 19 |  |
|---------------------------------------------------------------------|--------|---------|--------|---------|--------|---------|--|
|                                                                     | 550    | 1500    | 3000   | 125     | 300    | 550     |  |
| 10:00 to 10:08 p.m                                                  | (545)  | (200)   | (100)  | (2400)  | (1000) | (545)   |  |
|                                                                     | 630    | 1650    | 3300   | 133     | 315    | 630     |  |
| 10:12 to 10:20 p.m                                                  | (476)  | (182)   | (91)   | (2254)  | (952)  | (476)   |  |
|                                                                     | 730    | 1800    | 3600   | 143     | 345    | 730     |  |
| 10:24 to 10:32 p.m                                                  | (411)  | (167)   | (83)   | (2097)  | (869)  | (411)   |  |
|                                                                     | 850    | 2000    | 4000   | 155     | 375    | 850     |  |
| 10:36 to 10:44 p.m                                                  | (353)  | (150)   | (75)   | (1934)  | (800)  | (353)   |  |
|                                                                     | 980    | 2200    | 4400   | 166.5   | 425    | 980     |  |
| 10:48 to 10:56 p.m                                                  | (306)  | (136)   | (68)   | (1800)  | (705)  | (356)   |  |
|                                                                     | 1130   | 2450    | 4900   | 205     | 500    | 1130    |  |
| 11:00 to 11:08 p.m                                                  | (265)  | (122)   | (61)   | (1463)  | (600)  | (265)   |  |
|                                                                     | 1300   | 2700    | 5400   | 260     | 600    | 1300    |  |
| 11:12 to 11:20 p.m                                                  | (231)  | (111)   | (55)   | (1153)  | (500)  | (231)   |  |
|                                                                     | 1500   | 3000    | 6000   | 315     | 666    | 1500    |  |
| 11:24 to 11:32 p.m                                                  | (200)  | (100)   | (50)   | (952)   | (450)  | (200)   |  |
| * Eastern standard time for WWV, Washington, D. C. Pacific standard |        |         |        |         |        |         |  |
| time for 6XBM, Califor                                              | nia.   |         |        |         |        |         |  |

In the above table the numbers represent the frequency in kilocycles and the numbers in parentheses the approximate wave length in meters.

### Value of Radio

The institution of the radio pro-

nicious advertising propagandists.

now, for the artists Mr. Kent has engaged are without peer in the musical world. Who can call radio broadcasting crude and uncultured when Small Dimensions Increase such stars as Reinald Werrenrath, the world famous singer; Louise Homer, contralto of the Chicago Civic Opera Company; Mabel Garrison, of the Metropolitan Opera; Anna Case, Frieda Hempel, Mischa Levitzki, pianist; Toscha Seidal, renowned Russian violinist; Edward we obtain such a natural tone and Johnson, of the Metropolitan, and clearness of enunciation from our many others will face the microphone loud speakers. My answer is 50 per and deliver their best efforts into it? cent due to compactness of the Of course, we will always have our sound chamber and 50 per cent to dance orchestras, for even the most the proper design of the diaphragm intellectual folk must have diversion and the shape of the sound chamber and entertainment, but if one wants It is well to consider that any loud to hear the best there is to be heard speaker of the horn type is operated in serious music, a radio set will now on the principle that a column of bring it to him in clear and undis- air increasing in cross section with

World Series Games To Be

ments were perfected with "The New- with too much "whoof" in it. ing schedule does not operate on Sun-

A schedule of the games to be Sam Siegal Presents Program Wednesday, October 7..2:45 to 4 p.m. scheduled to continue in his series Thursday, October 8....2:45 to 4 p. m. of concerts on Wednesday evening at

### Prominent Artists Radio Manufacture Increase Aesthetic Reciprocates With Navy on Patents

The United States Navy has just grams by prominent concert and granted a license to the Pacent Elecopera stars as announced by A. tric Company of New York whereby Atwater Kent, the well known radio the latter radio manufacturing or-Manufacturer, will settle once and ganization is permitted to make use of valuable patents controlled by the for all the question of the æsthetic navy. These include the important value of broadcasting, in the German radio patents taken over by opinion of S. R. Wiley, president of the government since the World War, the National Radio Service League, circuits, the reflex principle and the newly formed organization of other radio developments of prime importance.

"In the past self-appointed critics In return for the navy license the of radio, particularly people in the certain rights to the United States theatrical profession, found them- Navy, among them the basic radio selves attracting profitable publicity plug and improved radio plug patents, whenever they publicly deprecated patents on rheostats and potentiomthe value of broadcasting," says Mr. eters, as well as numerous refine-Wiley. "The more disdainful the at- ments and improvements in radio titude they adopted, the more atten- parts. The basic radio plug patent tion their remarks earned, so for a was granted upon application made while we heard radio mercilessly de- by L. G. Pacent at the very beginning nounced as an endless procession of radio broadcasting, and to-day a blatant jazz bands, silly bedtime number of plug manufacturers are story tellers, medical quaeks and perroyalty for manufacturing rights. "No one can make such criticism Quite recently still another has been added to the extensive Pacent plug patents, this last dealing with

### Tone Quality of Loud Speaker By H. H. Shotwell

Chief Engineer, the Operadio Cor-

I have been asked repeatedly how

distance from the diaphragm is set into vibration at the dianhraom While the sound wave is relatively Reported in Detail by WOR small at the diaphragm it is ampli-A most timely feature scheduled on fied as the column of air is disthe WOR program each afternoon, placed to the big opening of the commencing October 7 will be the sound chambers or horn. Some loud broadcasting play by play of the speakers have too dark a tone beworld series games to be staged at cause the column of air which must Washington and Pittsburgh. It was be displaced is so long that the decided by the WOR executives that sharpness of the original sound detailed news of the games would vibration as it leaves the diaphragm transcend in importance any other is greatly diminished, with the reentertainments that could be sent sult that from these loud speakers over the air and accordingly arrange- we obtained a muffled tone or a tone

ark Evening News" to supply com- So for this very reason we are plete details of the games played by using a loud speaker of relatively commencing October 7, will be the small dimensions; the column of air contestants for the American classic. to be displaced is quite short—about All the games will be reported faitheighteen inches. Mellowness of tone fully with the exception of the Sunis not sacrificed, as it is obtained day game, which will be omitted, due where it should be-in the diaphragm. to the fact that the WOR broadcast- The diaphragm is so designed as to give a mellow tone.

Sam Siegel, mandolin virtuoso, is Friday, October 9...... 2 to 4 p.m. 9:15 o'clock, presenting a semi-classi-Saturday, October 10.... 2 to 4 p.m. | cal program of solo numbers.

### Brings you every crack of the bat —every roar of the crowd!

"Strike two-that makes two and twoand the crowd's going crazy—listen to 'em trying to rattle the pitcher—but he's cool he winds up-it's a fast one-he hit it-oh. what a smash!-Listen to that yelling-it's a three-bagger to deep left field . . ."

Your seat at the World Series game is waiting for you. It's right in the press box where you see everything that happens. And it's a big, deep, comfortable chair, your favorite chair in your own living room. For you can be the center of a miracle; you can be in two places at once. All you need is a radio . . . Have you got one? If not, don't delay another day. There's something happening every minute, something much too

But don't buy just a radio. Get one that is scientifically built, one that is built for allround service-for tone and volume, distance and selectivity—one you can depend on when you want it. In short, an Atwater Kent.

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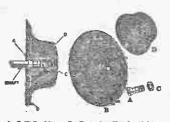
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The split bushing method of mount ing dials and knobs gives you a positive "tite" grip that does not work loose and aligns the dial rite. No set screws to lose or threads to tear, no channelling and spoiling shaft through dial sliding.

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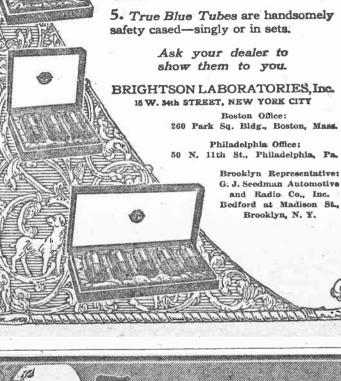


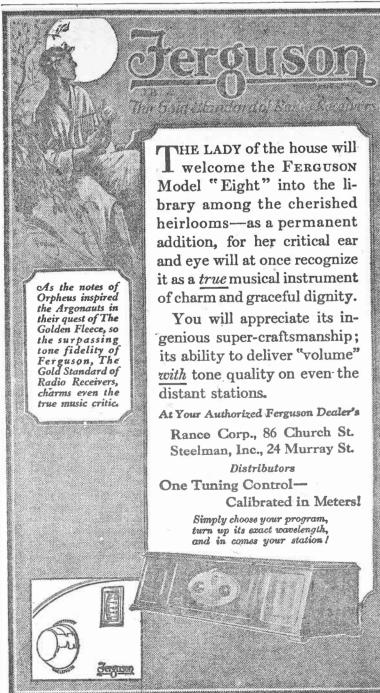
be on one side of the shaft. This

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If you want to buy, sell or exchange your make the spark of such nature or so radio sets or parts the Radio Exchange will arrange the circuits that the radiohelp you.

### Causes of Radio Interference Laid to Electrical Devices may often be observed at night, especially in hot weather. - However,

BRIGHTSON TRUE BLUE Power-Line Induction Is One of the Most Frequent interference to radio reception. Kinds of Disturbance and May Be Eliminated by Proper Location of the Antenna

> ADIO reception is, in some localities, seriously disturbed by interference arising from electrical apparatus in the vicinity. A brief outline of the sources of such interference and the sible by cleaning the commutator methods usually used in mitigation are given herein together with and proper setting of the brushes. references to further information. The only general remedy for elec- The remaining interference is sometrical interference is co-operative effort, on the part of users of radio times overcome by placing two conand users or owners of the electrical sources of disturbance, to reduce densers (about 2 microfarads each) or eliminate the causes of the trouble.

Much of the work in mitigation of improvement in the operation of the filter circuit is necessary. A con- "Sparking Apparatus." electrical devices or supply lines and denser (1 microfarad more or less) is thus a double gain. There are, will short circuit a considerable however, some electrical devices amount of the radio-frequency curwhich, even when in perfect working rent, or a condenser connected from order, cause disturbances which re- each side of the line to ground will sult in interference with radio reception. In many cases it is possible to in each side of the line, in addition keys. provide filters, shields, chokes, etc., to the condensers connected to either at the source of disturbance ground, forms a simple filter circuit or at the receiving set, which do which should prevent frequencies in much to relieve the difficulties.

inherent limitation of radio recepupon radio reception is not only the or is impractical, the apparatus may rection that particles going up the mitting stations and the sensitive- solid metal sheet or wire screen against the walls, where they stick. electrical disturbances which drown the apparatus. This may be difficult. in their operation is obtained from This background of electrical diturb- system of a gasoline engine the spark generates radio frequency alternating

Power-Line Induction

rent power wires near the antenna and current-carrying capacity should trouble. But if the rectifier is sepaor receiving set. Low frequency vol- be used, and the power company rated from the chimney the wire tages (usually 60 cycles) are induced should be consulted before making which joins them forms a good anand the resultant current flowing in the installation. Additions to the tenna which will radiate and cause the receiving circuit causes a "hum- power lines should be made only by interference for twenty miles or ming" sound in the telephone re- qualified persons. ceivers. The low pitch of the hum will usually identify this source of interference. A method of eliminating or at least reducing the magnitude of this interference is to place itself. The next thing is to open the parts is impracticable damping rethe antenna as far as possible from electric switch at the house meter; sistances can be inserted at various the wire lines and at right angles to if the interfering noise is still heard points in the wire line which will rethem. When the interference cannot in the radio set the source is then duce the amount of power radiated. be eliminated by such means the known to be outside the house. It Tuned circuits connecting across the proper choice of a receiving set may is then desirable to report the situahelp. An inductively coupled twocircuit receiving set is less susceptible Many of the companies have appower. to such interference than a single- paratus for the purpose of following circuit set. The use of one of more up complaints of this kind. Usually stages of radio frequency amplifica- a sensitive receiving set with a coil tion should also help to filter out antenna is used to determine the the audio frequency interference. It direction from which the interfering has been suggested that aduio fre- noise comes, and this outfit is taken quency interference might be shunted from place to place until the source around a receiving set having a is found. The location of such market and weather reports supplied series antenna condenser by connect sources is often a very difficult and by the United States Department of ing between the antenna and ground baffling undertaking. The trouble Agriculture and the New York State terminals of the set a high resist- sometimes comes from a spark dis- Department of Farms and Markets, ance, which will offer lower imped charge over an insulator to ground, together with "The American Agriance to the audio frequency than will or between a pair of wires, or it may culturist," each day except Saturday

Sparking Apparatus Sparks are produced in the normal operation of many types of electrical pany and a potential source of for their produce and in planning apparatus, such as motors, doorbells, serious trouble and for these reasons their work, which is directly dependbuzzers, gasoline engines, X-ray ap- the company is probably more in- ent upon the weather. paratus, violet-ray machines, some forms of battery chargers, rural telephone ringers and heating pad thermostats. Sparks are also sometimes produced at defective insulators, transformers, etc., of electric wire lines. Sparks usually give rise to electric waves which travel along the electric power wires and by them are radiated out and are then picked up by radio receiving sets. The noise thus produced in a radio set may come from a disturbance which has traveled several miles along the electric power wires.

One remedy for such types of interference is to eliminate the spark. This is possible if the spark is an electrical leak and not necessary to the operation of the machine in which it occurs. Many very useful electrical machines, however, require for their operation the making and breaking of electrical circuits while they are carrying current, and whenever this happens a spark is produced It is impossible to eliminate these machines, so that it is necessary to

To prevent the radio-frequency current produced by a spark from getting on to the lines connecting the

sparks which are too small to be readily noticed may cause serious

Commutators

Where d. c. motors are in operation near a radio receiving set interference is sometimes caused, especially when the brushes on the motor are sparking badly. The sparking should be reduced as much as posin series across the power supply line and connecting their midpoint to a good ground system. This is subelectrical interference results in an sparking apparatus some form of stantially as outlined above under

connected across the sparking points Another source of interference is the ringing machine used in rural telephone exchanges. Telephone engineers can reduce or eliminate interference by connecting a filter between the machine and the ringing

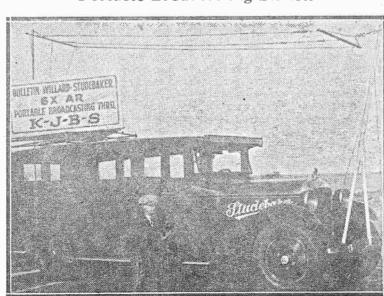
Many cases of radio interference the broadcast range from getting on have been caused by electrical pre-Part of the disturbance from elec- the line. A high inductance (choke cipitators which are used to prevent trical devices is practically inevitable | coil) or high resistance connected in | smoke and noxious fumes or material and must be regarded, like atmos- each side of the line changes the from leaving the chimney. The prepheric disturbances, as part of the characteristics of the circuit so as to cipitator operates by establishing a reduce the amount of power radiated. highly charged electric field inside tion. In other words, the limitation If such a filter circuit is not effective the chimney of such a nature and didistance and the power of the trans- in some cases be surrounded by a chimney are charged and driven ness of the receiving set but also the which is thoroughly grounded. The Precipitators cause interference for omnipresent background of slight screen should completely surround the reason that the high voltage used out signals below a certain intensity. For example, in shielding the ignition a rectifier which produces sparks and ances is the underlying reason why coils and all wires and other parts of current as well as the direct current reception from local stations is in- the system must be inclosed in metal which the precipitators need. If the herently superior to reception from shields, and these must be very well precipitator is so designed and arranged that the distance between the When any connections are made to rectifier and the chimney is only a the power line, in order to avoid fire few feet or if the entire apparatus, A frequent cause of interference and personal injury, only apparatus including all leads, is housed in a is the presence of alternating curthat is carefully tested as to voltage metal building there is usually no more. Interference from these precipitators can be eliminated by placing a grounded wire screen entirely The first thing to do in tracing the around these wires and thoroughly source of trouble is to make sure grounding the wire screen and the that it is not in the receiving set rectifier. If screening of the various Market and Weather Reports

For the Farmers' Benefit

be that the wire is touching some and Sunday at 12 noon. object such as a tree, pole, guy wire, These reports are of great imporetc. Such a spark discharge is a tance to the farmers in determining loss of power to the operating com- the correct prices they should receive

### Portable Broadcasting Station

Location of Interference



Above is shown the radio equipped car of Station KJBS. The transmitter is operated from storage A and B batteries and consists of a fifty-watt oscillator and modulator. While the vehicle was in motion successful re-broadcasting was accomplished at a distance of four miles from the main station. The call letters of the portable outfit are 6XAR.

### New Type Variable Condenser plates it is necessary that the rotor Solves Interference Problem plates be mounted off center and that practically all the rotor plate surface

Tuning Characteristics of Sets, but Present Mechanical Problems for Maker

By William M. Henderson

EPARATING stations operating on wave lengths between 200 and more panel space than any other type 300 meters so that one may listen to one without interference of condenser, especially so when the from another has been a difficult task. In an effort to simplify eccentric type are made in standard the tuning of short wave stations engineers have experimented with capacities. and designed two types of variable condensers. The first type, known as the -

straight line wave length condenser | length change at this point. This is because it differed from those easily proved by the well known formerly used in that the wave length wave length and frequency tuning cause the stator plates are shaped to changes in the circuit proportionally formulæ. to the dial setting, appeared many months ago. If the government had them by so many meters this con-but still the stations are crowded at denser is given on this page. denser would have accomplished simplicity in tuning. However, station assignments are made in frequency and the separation between

with a straight line wave length con- lar. The photograph of the rotor denser. This curve, it will be seen, and stator plates of a concentric more than a foot long and six inches the lower dial settings.

tained by shaping the plates so that rotors and bearing trouble be elimi- metal and are capable of producing

this condenser was only a step in the the capacity change is slower on the nated, but the condensers can be several kilowatts of radio frequency lower dial settings than on the upper. made in standard sizes so that extra power. The action of these large Curve C given in Figure 1 was panel room is not required. This tubes does not differ from the action denser, which is the second type made with a straight line frequency to the construction of double and sets. The difference is only a matter done with the eccentric plate type for reasons that are very apparent.

The straight line frequency con- line frequency tuning chart.

capacity condenser three curves are the condenser is irregular.

and that this change is brought about easy moving instrument used.

tion to the problem of separating on the dial equally throughout the New York. short wave stations as easily as the tuning range of the circuit. The By means of the line connections oscillator tubes generate this carrier back to sound of much greater in

set to-day that employs variable condensers as the tuning control.

This current flowing in a coil surporting large groups of artists to the use of a balance weight to prepare the heavy portion of the rotor porting large groups of artists to the second function of the tube, detection, takes the audio frequency off rounding the metal induces in it Curve A shown in Figure 1 was from obeying the laws of gravity and the studio of WGY that station the carrying wave and makes it andobtained with a straight line capacity swinging down. If no balancing stretches out many miles of wire and lible. This audible signal may not resistance of the metal increase its condenser. This condenser is the old weight is used the bearings of the practically takes its transmitter to give a strong enough signal, so it is temperature to the degree desired. familiar semi-circular plate instru- condenser must be made tight so Buffalo, Syracuse, Rochester and introduced into a tube adjusted to This makes it possible to heat metals ment in which the capacity changes that the rotor will remain at any Utica. Artists in those cities who amplify. Thus the signal is strengthproportionally to the dial settings. position in which it is turned. The might not otherwise be heard via ened up to any degree desired. On in some particular gas and so control A glance at this curve will show that tight bearing makes the condenser radio may be introduced to the the other hand, it is often desirable the conditions very accurately. the frequency change of the circuit move stiffly, which in turn makes the is extremely large below 300 meters tuning more difficult than were an of WGY. Special events will be

within a comparatively small range; Tight bearings also wear loose and of the condenser's capacity.

lower dial settings is that a small position. change in condenser capacity causes | Many of the straight line frequency relatively large changes in wave condensers also are made with eccenlength and frequency when tuning in tric plates and in these the faults of short wave stations. The frequency the eccentric plate straight line wave thorough try-out before attempting set. Recently there have been some will soon be used in many phases of

change is even greater than the wave length condenser are greatly accen- another design.

shaft will make the turning of the rotor more difficult, as tight bearings must be used to prevent the rotor from slipping. The long swing of the rotor plates also requires much By building straight line wave give the desired characteristics and stations vary in size from 21/2 inches Curve B in Figure 1 was obtained the rotor plates are left semi-circu-

definite wave lengths and separated is much better than the former one, plate straight line wave length con- in diameter. The higher power sta-In the construction of the straight The straight line wave length line frequency condenser with concharacteristic of the condenser is ob- centric plates not only can loose tubes are made almost entirely of type of condenser lends itself easily of smaller ones used in receiving

WGY Links Western tion and detection of alternating cur-

Leading musical events of western station. WGY is already connected it back to the input and the cycle is any one lse in the United States.

station idea of broadcasting has been ternating currents having frequencies continents. growing. For example, WGY, WRC from a fraction of a cycle a second The amplifying property of the and WJZ of New York are frequently to several million circles per second electron tube has also been used to linked to broadcast simultaneously can be generated by the same tube some event which originates in simply by altering the circuit ar-Schenectady, Washington or New rangements which determine the fregrown up to permit broadcasting of a In the broadcasting stations of with defective hearing are received mentioned, has just been placed on condenser. From this curve it will be the market and does offer the solu-

ong wave stations.

With the new condensers the freWith the new condensers the fre
With the new condense quency of the circuit changes proportionally to the dial setting, thereby capacity, but for the last 30 degrees relayed by wire to New York and from the microphone which have of the original sound. giving an equal frequency separation the capacity increases at an enor Washington. In Buffalo, Syracuse, frequencies from 20 to 10,000 cycles A similar use is in public address between stations whether they be mous rate. This irregular change in Rochester and Utica will be remote per second and amplify them. How-systems where the normal voice of capacity is the secret of the straight control stations and studios. En- ever, these currents cannot radiate, a speaker is made audible to many gineers will supervise the pick-up so another set of tubes impress these thousands of people, that is, the denser not only simplifies tuning to a The construction of straight line either in studio or in outside audi- amplified voice currents on the radio- sound of the voice is amplified many great extent but also, through the wave length and straight line frequency generating tubes and times by use of several electron equal separation of stations, in quency condensers is much more first amplified at the source, will be creases the selectivity of the circuit, emplicated than that of straight especially on the formerly jammed line capacity type. Some straight of WGY. Here they will be ampliline wave length condensers are made fied again and sent on their journey frequency voice currents. To show further the advantages of with eccentric plates; that is, the to the transmitting equipment from the straight line wave length and stator plates are semi-circular but which they will be transferred to the When the radio-frequency current of the original voice. the straight line frequency condenser the rotor plates are cut away on one antenna to make the remainder of is induced in the receiving antenna, over the old type straight line side so that the capacity change of the journey via air to the tuned re- the audio frequency cannot be heard

capacity condenser three curves are given in Figure 1. These curves

This cutting away of the rotor were obtained from an actual tuning plates on one side results in an uncircuit such as is used in every radio

The condenser is irregular.

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The cutting away of the rotor which electron tube is in the electron tube is in the heating of metals. The tube is unless the radio frequency is partially destroyed. This is done by using the detecting property of the electron tube is in the heating of metals. The tube is unless the radio frequency is partially destroyed. This is done by using the detecting property of the tube is in the heating unless the radio frequency is partially destroyed. This is done by using the detecting property of the condenser is irregular.

The cutting away of the rotor were obtained from an actual tuning plates on one side results in an uncircuit such as is used in every radio. ceivers. the three great stations.

Sets in Hungary Prohibited The governmental decree which leak, etc. terest in radio is, nevertheless, apparent and it is believed that, if perwithin a comparatively small range of the condenser's capacity.

The reason for this crowding on the lower dial settings is that a small position.

Tight bearings also wear loose and mitted, the use of radio receivers will develop rapidly subsequent to the issuance of the regulations.

The reason for this crowding on the lower dial settings is that a small position.

Tight bearings also wear loose and mitted, the use of radio receivers will develop rapidly subsequent to the issuance of the regulations. likely prospective dealers.

Always give a new hook-up

### tuated. To obtain a straight line frequency characteristic with eccentric Radio Vacuum Tube May Be Employed for Many Purposes

type of condenser must also be made Straight-Line Frequency Instruments Improve with long plates, so it is easily seen This Wonderful Device, Which Is Known as the that the weight of 'he plates on the Heart of Wireless, Is Also Used by Telephone **Engineers, Doctors and Scientists** 

By Dr. C. B. Jolliffe

Radio Laboratory, United States Bureau of Standards

T HAS been said that without the development of electron tubes the present system of radio broadcasting would never have been possible. Certainly, the electron tube is the essential part of our length and straight line frequency radio telephone broadcasting system as it has developed. Every broadcondensers with concentric plates no cast transmitting station uses several electron tubes in order to make trouble with loose bearings or large available radio signals that may be picked up by receiving sets, the rotor swing will be encountered be majority of which are likewise equipped with electron tubes.

continually cooled by water. These triple units, a thing that cannot be of size and power supplied.

The electron tube is capable of performing two functions, amplificarent voltages. Its action as an ampli- for special purposes, which are ex-N. Y. Cities by Wire fer makes possible a third function, plained in the advertisements. that is, generation or production of alternating current.

This third function is used pri-In the past two years the chain- the action is instantaneous, and al-

to 1,500,000 cycles per second. The

The Detector Tube's Job

unless the radio frequency is par-

tubes put on the market designed science.

Radio Interferes With School Work in Japan

TOKIO (A).-The radio .craze has grown to such an extent in Japan that some of the middle school authorities in Tokio have issued orders that students shall not "listen in" during certain hours of the evening, but shall devote these hours to their studies. The school heads found upon investigation that the youngsters were neglecting their school work in the evening to listen to the

and central New York State cities marily in transmitting sets, although amplify telephone currents, have will be made available to the inter- some receiving sets make use of it been inserted in the long distance national audience of WGY as a result also. A disturbance is started in the telephone lines, and have made it of wire-connecting Buffalo, Roches-ter. Syracuse and Illies to the transter, Syracuse and Utica to the transmitting equipment of the Schenectady virtue of some form of coupling, gives the United States can now talk to

by wire to Albany, Poughkeepsie and repeated continuously. Because of In the not too distant future even New York and through WJZ and this the disturbance is not allowed this limit will be removed, as it has WRC. Leading musical events of to die away but is sustained, the been shown that it is possible to Washington are conveyed to the Gen- power being supplied from external combine radio and wire telephony, eral Electric Company's Eastern sources, such as batteries. Since the and before many years the telephone electron current has no inertia effects system of America will be intercon-

paratus gives a faithful reproduction

A New Use for Tubes

carried by wire to WJZ and WRC by means of the electron tube. All of doctors simultaneously to hear the and may be heard from any one of these different uses are brought out heartbeats of a patient. Electron by the correct arrangement of the tubes have made it possible to send circuit constants such as the in- pictures by wire and radio, and just ductance, capacity, grid voltage, grid recently there was produced at a distance the image of moving objects The different possible sizes and ad sent by radio using electron tubes. will contain regulations governing the sale and operation of radio sets justments of the various circuit conhas not as yet been issued and consequently the sale of radio sets and different types of receiving sets. Up the rate and method of growth of a parts is not legally permitted. In- to very recently the development in plant root, which illustrates how it

Electrical supply houses are the most small adjustments. The choice of a many diverse applications. New uses tube for a particular receiving set is are being found every day and a tool usually a matter of filament power which found its greatest development consumption and power output of the in radio and telephone engineering

## The Herald Tribune Daily Broadcasting Programs for Week Ending October 10

### TO-DAY WJZ-NEW YORK CITY-455 comic stories. 11 a. m.—West End Presbyterian Church services. 12:30 p. m.—Rivoli Sunday concert. 2:30 p. m.—Radio Bible class. 3:30 p. m.—Fanny Sielig, soprano. 4 p. m.—St. George's Church vesper ices. 7 p. m.—Nathan Abas's Orchestra. 8 p. m.—Scores; news. 8:05 p. m.—'Reminisences of a Reporte William H. Crawford. 8:30 p. m.—To be announced. 10 p. m.—Godfrey Ludlow, violinist. 10:30 p. m.—News. WJY-NEW YORK CITY-405 o. m.-Rodin Kehlman, soprano 8:35 p. m.—To be announced. 8:45 p. m.—Rodin Kehlman, soprano. 9 p. m.—Allen Trio. 9:30 p. m.—To be announced. 9:45 p. m.—Allen Trio.

WEAF-NEW YORK CITY-492 WEAF—NEW YORK CITY—492

2 p. m.—Sunday hymn sing.
2:45-3:45 p. m.—Interdenominational services. Address by the Rev. Robert Falconer; Federation singers
3:45-5:30 p. m.—Men's conference in the Y. M. C. A. Address by Dr. S. Parkes Cadman, "A Great Conference." Answers to questions. Gloria Trumpters.
7:20-9:15 p. m.—"Capitol Theater Family."
9:15-10:15 p. m.— Reinald Werrenrath, barytone. WGBS-NEW YORK CITY-316

whn-new york city-361
p. m.-Marsh McCurdy, organist.
2:30-3:30 p. m.-Christian Endeavor pro gram.
5 p. m.—Dance orchestra.
7:30-10 p. m.—Church service.
10:45 p. m.—Janssen's Orchestra. WRNV-NEW YORK CITY-210 WRNY-NEW YORK UT1-202
2:45 p. m.—Spiritual concert.
4 p. m.—'Unsettled America.''
WMC4-NEW YORK CITY-341
11 a. m.-12:15 p. m.—Christian Scie
services.
5:30 p. m.—String Quartet.
6 p. m.—Roemer's Homers.
7 p. m.—Ernie Golden's Orchestra.
7:35 p. m.—Ocott Vail's String Ensen
WERH\_NEW YORK CITY-273

WFBH-NEW YORK CITY-273 m.—Field Artillery Band.
m.—Masonic news.
p. m.—Arrighi Choir Singers.
p. m.—Bossert Lumber Jacks.
m.—Arthur Kraus's Orchestra. WLWL-NEW YORK CITY-288 WRRR—STATEN ISLAND—273 10 a. m.—Watchtower Orchestra; soprano 10:30 p. m.—Bible Lecture, Judge Ruther

ford.

11 a. m.—Soprano; orchestra.

9 p. m.—Choral Singers.

9:10 p. m.—Violin Choir; singers.

9:30 p. m.—Bible Lecture, Judge Ruther 10 p. m.—Choral singers; violin choir; singers. WGCP-NEWARK-252 8 p. m.—Charlotte Trystmann, planist. 8:15 p. m.—Ralph Hersh, violinist. 8:30 p. m.—Vincent Laine, tenor. 8:45 p. m.—Lillian Gordone, contralto. 9 p. m.—Mildred Newman. 9:15 p. m.—Billy Rhodes, tenor. 9:30 p. m.—Strickland's Orchestra.

WIP—PHILADELPHIA—508
10:45 a. m.—Morning service.
WOO--PHILADELPHIA—508 2:30 p. m.—Musical exercises p. m.—Sacred recital.
7:45 p. m.—Evening services. WFI-PHILADELPHIA-395 n.—Services.
m.—Chapel service. WCAU-PHILADELPHIA-278
m.—Songs.
p. m.—Undenominational Radio

5 p. m.—Songs.
5:15 p. m.—Undenominational Radio Church.
5:25 p. m.—"Book of Psalms."
5:35 p. m.—Recital.
6 p. m.—Pennsylvania Concert Orchestra. WPG—ATLANTIC CITY—300
p. m.—Vocal and instrumental recital
m.—Ambassador Concert Orchestra. 10 p. m .- Organ recita WHAR—ATLANTIC CITY—275
p. m.—Short sacred recital.
p. m.—Evening service.
m.—Seaside Trio.

9 p. m.—Seaside Trio. 11:15 p. m.—Strand organ recital. WRW-TARRYTOWN, N. Y.-273 8:05 p. m.—Services. 10:80 p. m.—Musical program. WGY-SCHENECTADY-380 m.—Service.
p. m.—Service.
m.—Godfrey Ludlow, violinist. WGR—BUFFALO—319
n.—Vesper services.
n.—Evening service.

WHAM-ROCHESTER, N. Y .- 319 WHAM—ROCHESTER, N. Y.—278 5 p. m.—Radio Chapel services. WJAR—PROVIDENCE—306
7:20-9:15 p. m.—Capitol Theater Fa
9:15 p. m.—Reinald Werrenrath, bar WEEI-BOSTON-349 9:15 p. m.—Reinald Werrenrath, WNAC-BOSTON-280

10:50 a. m.—Morning service. 1:30 p. m.—Concert. 7:20 p. m.—Evening service. WBZ—SPRINGFIELD, MASS.—333
10:55 a. m.—Church services; organist a choir of twenty-four.
8 p. m.—The Henry Quartet.
8:30 p. m.—Estey organ.
9:30 p. m.—Frances Foskett, soprano.

WCTS-WORCESTER, MASS.-268 7:20-9:15 p. m.—Capitol Theater music. 9:15 p. m.—Reinald Werrenrath, baryto WCAP-WASHINGTON-469 11 a. m.—Service. 4 p. m.—Service. 7:20-9:15 p. m.—The Capitol Family. 9:15 p. m.—Reinald Werrenrath, baryton

KDKA—PITTSBURGH—309
a. m.—Church service.
p. m.—Vesper service.
a. m.—Church service. WCAE--PITTSBURGH-461 m.—Dinner concert, m.—Capitol Theater program WEAR—CLEVELAND—390

m.—Theater orchestra. m.—Mixed quartet; instrumental qu WLW-CINCINNATI-422 m.—Concert. WKRC—CINCINNATI—326

7:45 p. m.—Songs and service.
11 p. m.—Classical program.
WSAI—CINCINNATI—326 8:45 p. m.—Program from WEAF. 8:30 p. m.—Sermonette chime concert. WWJ-DETROIT—353 7:20 p. m.—Capitol Theater program. WREO—LANSING—286 8:30 p. m.—Church service. KYW—CHICAGO—536 5-7 p. m.—Studio concert. 8 p. m.—Dr. Howard, speaker; chorus

WLS-CHICAGO-345 m.—Organ solos.

Little Brown Church.

WCBD—ZION CITY—345 WCBD—ZION CITY—345

9 p. m.—Mixed quartet and artists.
WHT—CHICAGO—400

7:30 p. m.—Tabernacle and choir.
10:15 p. m.—Request program.
11:30 p. m.—Back Home Hour.
WQJ—CHICAGO—488

9-11 p. m.—Rainbow Gardens Orche

### **MONDAY**

m.-Home service talk. m.-May Breen, Peter de Rose 11:15 a. m.—May Breen, Peter de Rose.

11:15 a. m.—'Embroidery.''

11:30 a. m.—May Breen, Peter de Rose.

11:40 a. m.—Tailt; May Breen.

12 noon—Market and weather reports.

2:30 p. n.—Government Club meeting.

Speakers, Norman Imrie, Richard E. Enright.

30 p. m.—Cottand right.

30 p. m.—Gertrude Toole, soprano.

140 p. m.—Shell Beach Trio.

3 p. m.—Dinner music.

4 p. m.—Musical program.

7.15 p. m.—Musical program from Strand Theater. Remarks by Joseph Plunkett; Vocal and instrumental artists.

8.30 n. m.—Health talk.

Vocal and instrumental artists.
30 p. m.—Health talk.
45 p. m.—Paul Plaisted, pianist.
p. m.—'Music by Gypsies."
) p. m.—'Your Hour."
):30-11:30 p. m.—Ben Bernie's Orchestr. WJZ-NEW YORK CITY-155 a. m.—News.
p. m.—Meyer Davis's music.
4, 5:15, 8 and 10:30 p. m.—News.
6 p. m.—Scores, racing (half-hourly).
16 p. m.—News, baseball, racing.
26 p. m.—Market reports.
50 p. m.—Financial summary.

WGBS-NEW YORK CITY-316 0:40 a. m.—Fashion talk, piano.

30 p. m.—Scripture reading.

35 p. m.—Lee Graber, pianist.
p. m.—Crete Carton, soprano.
p. m.—Interview with E. Folsom,

10 p. m.—Leroy Montesanto, tenor.

20 p. m.—"Jewels to Wear"; tenor,

40 p. m.—Women voters.

50 p. m.—Leroy Montesanto, tenor,

p. m.—Uncle Geebee.

30 p. m.—Premier Orchestra.

p. m.—"The New Astrology,"

10 p. m.—Premier Orchestra.

WHN-NEW YORK CITY-361 5 p. m.—Al Wilson's Playmates.
5:15 p. m.—Betty Healy, stories.
7 p. m.—Marlboro Trio.
7:30 p. m.—Swanee Orchestra.
8 p. m.—Swanee Orchestra.
8 p. m.—Storage battery talk.
8:05 p. m.—C. Bryce Little, barytone.
8:45 p. m.—Bernard Share, violinist.
9 p. m.—Stella Harris, Jimmy Ford, Rul
Cowan, Charles and Harold Albert.
9:30 p. m.—Mr. and Mrs. Leo Wood, song
9:45 p. m.—Melody Male Quartet.
11 p. m.—Marsh McCurdy, organist.
11:30 p. m.—Revue and orchestra.
2 midnight—Ted Lewis and orchestra. m.-Al Wilson's Playmater

WRNY-NEW YORK CITY-259 9:30 a. m.—News.
10:30 a. m.—Women's hour.
12:30 p. m.—Trio.
4:15 p. m.—Studio program.
6:30 p. m.—Jimmie Lent's Orchestra.
7 p. m.—"Whose Birthday To-day?"
7:15 p. m.—Commerce of the day.
7:35 p. m.—Major Atkinson, "Beigium."
7:45 p. m.—Geography. 7:45 p. m.—Geography. 7:50 p. m.—"Lullaby Lady."

8 p. m.—Ferrucci's Orchestra.
8:05 p. m.—'Evolution of Jazz."
8:20 p. m.—Oldtime medley.
8:30 p. m.—Painters' series.
8:40 p. m.—Ferrucci's Orchestra.
8:45 p. m.—'Jazzing Kammenoi—Ostrow
9 p. m.—'Mars and Its Canals."
9:15 p. m.—Music Travelogue.
9:30 p. m.—'Moods in Song," Louise Ve mont.
9:40 p. m.—The Sad Negro.
9:45 p. m.—Mathilde Sper, piano dance.
10 p. m.—The Poetry Post.
10:10 p. m.—The Body," Dr. Bolton.
10:15 p. m.—Bob Shafer, Fred Fisher. WMCA-NEW YORK CITY-341

WMCA—NEW YORK CITY—341
2 noon—Olcott Vail's String Ensemble.
3 p. m.—Olcott Vail's String Ensemble.
30 p. m.—Ernie Golden's Orchestra.
30 p. m.—Lullaby Music.
p. m.—Hidda Goldmeyer, readings.
115 p. m.—Hida Goldmeyer, readings.
125 p. m.—Hida Goldmeyer, readings.
136 p. m.—Hida Goldmeyer, readings.
145 p. m.—Elsa Gray, seprano.
p. m.—Lecture on Christian Science.
0 p. m.—Messner Dance Orchestra.
1 p. m.—Avo Bombarger, tenor.
1 30 p. m.—Paul Alcuri, pianist.
WNYC—NEW YORK CITY—No

1:30 p. m.—Paul Alcuri, pianist.

WNYC—NEW YORK CITY—526
p. m.—Market High Spots.
130 p. m.—Stony Creek Orchestra.
130 p. m.—Police Alarms.
135 p. m.—Stony Brook Orchestra.
130 p. m.—Elementary German Lessons.
130 p. m.—Advanced German Lessons.
130 p. m.—Asalah Seligman, pianist.
130 p. m.—R. G. Parker, tenor.
145 p. m.—"World Series," John Foster.
15 p. m.—R. G. Parker, tenor.
16 p. m.—R. G. Parker, tenor.
17 p. m.—R. G. Parker, tenor.
18 p. m.—R. G. Parker, tenor.
19 p. m.—R. G. Parker, tenor.

0:30 p. m.—Police Alarms; weather. 0:35 p. m.—Harold Stern's Orchestra WFBH-NEW YORK CITY-273. m.—California Orchestra. m.—Bob Feron'e Orchestra. -Scores (quarter hourly p. m.—Scores (quarter hourly).

05 p. m.—Marion Doran, soprano.

15 p. m.—Jimmy Clark's Entertainers.

45 p. m.—Joe Sherman, songs.

15 p. m.—Yama Yama Boys.

30 p. m.—Catherine Connolly, soprano.

45 p. m.—Theo. Albany, tenor.

p. m.—Adele Espre, soprano.

15 p. m.—Majestic String Ensemble Scores.

s. m.—Hotel Majestic String Ensem ole. 1:30 p. m.—Alvin Hauser's "At Hom Party." arty."

WOKO—NEW YORK CITY—233

m.—Anna Diamond, pianist.

p. m.—Semalina Stevenson, soprano

p. m.—Lavinia Albro, soprano.

p. m.—Martin Waish, barytone.

p. m.—Colonial Dance Orchestra.

WHAP-BROOKLYN-240 7-8 p. m.—Dinner music.
WBBR—STATEN ISLANL—273
Weightal Musicians. 8 p. m.—Syrian Oriental Musicians. 8:10 p. m.—News digest. 8:25 p. m.—Barbara Jonasch, soprano. 8:35 p. m.—Bible instruction. 8:50 p. m.—Syrian Oriental Musicians. WAHG—RICHMOND HILL—316 noon)—Musical program.
p. m.—Thornton Fisher, sport tall
p. m.—Harold Brandhorst, pianist. 6:15 p. m.—Dinner concert. 7:30 p. m.—The Children's Period. 8:30 p. m.—Concert.

. m.—naroid Brandnorst, planis 1.—Dora Rose, soprano. . m.—Synchrophase Trio. . m.—Horace L. Taylor, reader. 1.—Piano and soprano solos. 9:30 p. m.—Synchrophase Trio. 10:05 p. m.—Glenn Smith's Orchestra. 12 midnight—Special nusical program WGCP—NEW YORK—252 m .- Songs; race results (hal hourly. :15 p. m.—Pendleton Syncopators.

3:15 p. m.—Pendleton Syncopators.

4 p. m.—Vocal and piano selections.

8 p. m.—Charles von Thome, pianist.

8:15 p. m.—Jeanne Laval, contraito.

8:30 p. m.—Emma May, soprano.

8:45 p. m.—Jimmie Flynn, tenor.

9 p. m.—Frances Brown, pianist.

9:15 p. m.—Bob Ward's little Wards.

9:30 p. m.—Strickland's Orchestra.

10 p. m.—Radio hour.

WAAM—NEWARK—263

11 a. m.—Happy Hour program. 11 s. m.—Happy Hour program, 7 p. m.—Ben Goldfarb's Orchestra, 7:30 p. m.—The sport oracle,

7:45 p. m.—Ben Goldfarb's Orchestra. 8:10 p. m.—Bill McWalters, tenor. 8:30 p. m.—Sweet Marie: Buttercup WEAF—NEW YORK CITY—492

8:30 p. m.—Bill McWaiters, tenor.
8:30 p. m.—Sweet Marie: Buttercup.
9 p. m.—Smiles and Giggles.
9:20 p. m.—Irma Leiss, soprano.
9:30 p. m.—W. M. Emery, barytone.
9:50 p. m.—Irma Leiss, soprano.
10 p. m.—Fred Frey's Sirens.
WOR—NEWARK—405
6:45-7:15-7:45 a. m.—Gym class.
2:30 p. m.—Yama Yama Boys.
2:45 p. m.—Talk, Mrs. Gibson Arnoldi.
3 p. m.—Eugene Spier, pianist.
3:15 p. m.—Yama Yama Boys.
3:30 p. m.—Eugene Spier, pianist. m.—Yama Yama Boys.

m.—Eugene Spier, planist.

m.—Talk, "Diet Value of Cheese."

m.—Words Mispronounced."

m.—Shelton dinner music.

m.—Shelton dinner music.

m.—Talks by aviators.

m.—Sports, Bill Wathey.

m.—Frances Williams, Al Wohln:
Eddide Elkin's Orchestra.

m.—C. Feland Gannon, barytone.

p. m.—"The Forty Immortals."

p. m.—"Al Reid's Hour."

p. m.—Edward Bierstadt, editor.

p. m.—Ballin and Race, piano duo.

m.—Ottilie Winn, soprano.

p. m.—Ballin and Race, piano duo.

p. m.—Archie Slater's Orchestra.

m.—Ottilie Winn, soprano.

m.—Ottilie Winn, soprano.

m.—Ottilie Winn, soprano.

p. m.—Irving Aronson's Orch WIP—PHILADELPHIA—508 WIP—PHILADELPHIA—508
6:45 a, m.—Setting-up exercises.
1 p. m.—Luncheon music.
3 p. m.—Artist recital.
6:05 p. m.—Dinner music,
7 p. m.—Bedtime story; dancing less
WOO—PHILADELPHIA—508 2 (noon)—Luncheon music. 45 p. m.—Grand organ; trumpets. 30 p. m.—Dinner music

7:30 p. m.—Dinner music.
8 p. m.—Musical program from N
Strand Theater,
8:45 p. m.—Paul Plaisted, planist,
9 p. m.—Music by Gypsies,
10 p. m.—"Your Hour."
10:30 p. m.—Ben Bernie's Orchestra,
11 p. m.—Dance music. m.—Dance music. WFI—PHILADELPHIA—395 10:30 a. m.—Solos; home serv -Tea Room Ensemble. m.—Eleanor Gunn Fashion Fea m.—Concert orchestra.
WLIT—PHILADELPHIA—395

5 p. m.—Educational talk.

5:50 p. m.—Scores and sports results.

7:30 p. m.—Dream Daddy.

8 p. m.—Short Agro waves

8:15 p m.—Concert orchestra

8:30 p m.—Artist recital.

9 p. m.—Movie review.

9:10 p. m.—Stanley Theater Overtus organ recital.

organ recital.

10 p. m.—Staniey Theater Over
organ recital.

10 p. m.—Dance orchestra.

10:30 p. m.—Vaudeville features.

10:45 p. m.—Jimmy Jones's Syncopate

WCAU—PHILADELPHIA—278 8 p. m.—Songs. 9:30 p. m.—Radio talk, Wilson Durham 9:40 p. m.—Popular songs. 10 p. m.—Popular songs.
10 p. m.—Herman Schwartz, dance music wPG—ATLANTIC CITY—300
1:30 p. m.—Organ recital.
p. m.—Dinner music.
p. m.—Fashica.

p. m.—Traymore Concert Orchestra.
0:30 p. m.—Dance Orchestra.
WHAR—ATLANTIC CITY—275 .—Seaside Trio.
m.—Lecture period.
.—Seaside Trio.
WGY—SCHENECTADY—380 2 p. m.—Music; household talk. 2:30 p. m.—Asia Orchestra. 6:30 p. m.—Dinner program. 7:30 p. m.—WGY Orchestra; Radio Fot WBW—TARRYTOWN, N. Y.—273

m.—Musical program; m.—Entertainment; WGR-BUFFALO, N. Y.-319 30 p. m.—Concert.
p. m.—Evangelistic Choir.
p. m.—Mary Zoller, soloist 1 p.m.-1 a. m.—Supper music.
WHAM—ROCHESTER N. Y.—278
30 p. m.—Eastman Theater Orchests
p. m.—Theater organ.
p. m.—Theater orchestra.

Quartet. 0:30 p. m.—Address, 'Fire Prevention.'' 10:30 p. m.—Hall's University Orchestr WJAR—PROVIDENCE—306 WJAR—PROVIDENCE—306

10 a. m.—Housewives' Exchange.

1:05 p. m.—Studio program.

8 p. m.—"Berry Spring Time."

8:50 p. m.—Mrs. Harrop. "Red Cross."

9 p. m.—"Music by Gypsies."'

10 p. m.—Orchestra selections.

WTIC—HARTFORD, CONN.—476

6:30 p. m.—Dinner music.
6:45 p. m.—Weather report; scores.
7:45 p. m.—Talk, John W. Titcomb.
8 p. m.—Dinner music.
WEEL-BOSTON—349
6:45 a. m.—Tower health exercises.
10:45 a. m.—Uhome Service Talk."
2 p. m.—Dance orchestra, vocal and strumental artists.

strumental artists.
6:30 p. m.—Big Brother Club.
7:20 p. m.—Lost and Found; scores.
7:30 p. m.—Musicale; talk.
8 p. m.—Eisenbourg's Orchestra.
8:30 p. m.—Program same as WEAF.
10:10 p. m.—Marimba Band; Holm WNAC-BOSTON-280 WNAC—BUSTUN—zbu
10:30 a. m.—Bible reading; club tall
12:15 p. m.—Organ recital.
1 p. m.—Concert orchestra.
1:50 p. m.—Morey Pearl's Ramblers.
2:50 p. m.—Ray Sinatra, plano.

m.-Kiddies' Klub. 6:30 p. m.—Ray Stewartson's Orchestra. 7:35 p. m.—Metropolitan Theater. p. m.—Johnnie Duffio benefit.

WBZ—SPRINGFIELD, MASS.—333 30 p. m.—Capitol Theater Orchestra, p. m.—"Fire Prevention." 30 p. m.—Gladys Bridgham's Players. p. m.—Gladys Bridgham's Players, p. m.—Capitol Theater Orchestra. :30 p. m.—Wm. Filene's Band; Minn Warner, contrairo Varner, contraito.
5 p. m.—"Red Cross Program for 1926.
p. m.—Grace Kempton, soprano.
20 p. m.—Brunswick Orchestra.
WCTS—WORCESTER, MASS.—268

10:30 a. m.—Radio Chats. 12-2 p. m.—Luncheon music.; story teller scores. :45 p. m.—Statistical report. p. m.—Statistics.
p. m.—Concert program.
WRC—WASHINGTON—469
Hope from WJZ. 0 a. m.—Women's Hour from WJZ 2 noon—Organ recital. p. m.—Shoreham Orchestra. WCAP—WASHINGTON—469 WCAP-WASHINGTUN-200
7:15 p. m.—Market summaries.
8 p. m.—"Fire Prevention."
8:30-8:45 p. m.—"Tower Health Talk."
9-10 p. m.—Music by Gypsies.
10-11 p. m.—Washington Post Hour.
KDKA—PITTSBURGH—309

TUESDAY WNYC-NEW YORK CITY-526
7 p. m.—Market high spots.
7:10 p. m.—Dance music, The Candians.
7:30 p. m.—Police alarms.
7:35 p. m.—The Canadians.
8 p. m.—Leo Lynch, tenor.
8:25 p. m.—Trio Unique.
8:50 p. m.—Dounia Rutenberg, pianist, with Simon Cohn.
9 p. m.—Harold Lieberman, violinist,
9:15 p. m.—Dounia Rutenberg, pianist,
9:30 p. m.—Harold Lieberman, violinist,
9:45 p. m.—Mathilda Lindsay, soprano.
10:10 p. m.—Health Talk, George Keane.
10:30 p. m.—Police alarms; weather.
7:30 p. m.—Ambassador Trio. WNYC-NEW YORK CITY-526 0 p. m.—Ambassador Trio.
p. m.—To be announced.
p. m.—Honest Ballot Association.

### Eastern Standard Time

WOR-NEWARK-405 6:45, 7:15, 7:45 a. m.—Gym class. 2:30 p. m.—Dorothy Hall, "The Busines Girl." Girl."

2:45 p. m.—Jack Smith, pianist.

3 p. m.—Fred Koester's Orchestra.

3:45 p. m.—Dr. Little, "The Collie."

6:15 p. m.—Words Mispronounced."

6:17 p. m.—Sports, Bill Wathey.

6:30 p. m.—"Man in the Moon" stories.

6:55 p. m.—Talks by aviators.

7 p. m.—Shelton dinner music.

WAAM-NEWARK-263 1 a. m.—Cameron Emsile, planist. 1:10 p. m.—'Body Building'; Cameron Emsile, planist. 1:35 p. m.—Motion picture forecast; m.—Margaret MacKenzle, m.—Talk on New Jersey,

00 p. m.—Women's program; talk and music by Ida Greenberg. 8 p. m.—'Financial Events."
8:10 p. m.—Ross Gorman's Orchestra.
8:30 p. m.—The Twins.
9 p. m.—Eveready Hour.
10 p. m.—Grand opera, "Carmen."
11-12 p. m.—Meyer Davis's dance music.
WLWI.—NEW YORK CITY—288
8 p. m.—Question Box; Catholic Study
Club; vocal and instrumental solos.

WGBS—NEW YORK CITY—316
D a. m.—Timely Talks with Terese:
0:10 a. m.—Mildred Marsh, soprano.
0:20 a. m.—Household talk; songs.
0:40 a. m.—Thrift talk; songs. 10:30 p. m.—Scripture readings.
1:35 p. m.—Scripture readings.
1:35 p. m.—Walter Maurice, songs.
2 p. m.—Juliette Lane, soprano.
3 p. m.—Interview.
3:10 p. m.—Caroline Lowe Studio.
3:20 p. m.—Interview with Wheele :30 p. m.—Caroline Lowe Studio,

WJZ-NEW YORK CITY-455

4-6 p. m.—Scores, racing (half hourly). 4:05 p. m.—Tea music. 5:15 p. m.—News, baseball, racing. 5:26 p. m.—Market reports.

Herald Tribune.

1:15 p. m.—Vanderbilt Orchestra.

1:10 p. m.—Scores, racing returns.

1:10 p. m.—Wusicale.

1:10 p. m.—"Conservation of Natural H.

1:25 p. m.—William Ballyn, sea songs.

10 p. m.—"Over the Seven Seas."

10:30 p. m.—Mayflower Orchestra.

WEAF-NEW YORK CITY-492 45-7:45 a. m.—Health exercises.

2 noon—Market and weather reports. p. m.—Tallsman Trio. :30 p. m.—Women's program; talk a

a. m.—News. p. m.—Nathan Abas's music.

p. m.—Nathan Abas's n 4, 5:15, 8 and 10:30 p.

3:40 p. m.—Caroline Lowe Studio, 3:40 p. m.—Piano. lessons; studio, 6 p. m.—Uncle Geebee, 6:30 p. m.—Verkes's Orchestra, 7 p. m.—Arrowhead Orchestra, 8 p. m.—Vincent Stortz's Entertainers, 8:30 p. m.—Wertheim Brothers, kg 30 p. m.—welchen.
ukelele.
340 p. m.—Vincent Stortz.
3:50 p. m.—Wertheim Brothers.
9 p. m.—Florence Church, planist.
9:10 p. m.—Henrietta Turner, Uke Girl.
9:20 p. m.—Florence Church.
9:40 p. m.—Anita Priest, contraito; Chris

Mechan, tenor.

30 p. m.—Arrowhead Inn Orchestra.

n.—Ford and Purcell. WHN-NEW YORK CITY-361 p. m.-Marsh McCurdy, organi WHN—NEW YORK CITY—361
12:30 p. m.—Marsh McCurdy, organist.
2:15 p. m.—Overture and vaudeville.
3:15 p. m.—Lexington Theater Orchestra.
4:30 p. m.—Lele Robert's Pals.
7 p. m.—Iceland Orchestra.
7 p. m.—Iceland Orchestra.
8 p. m.—Will Oakland's Shanley.
8 p. m.—Moe Mann, barytone.
8:15 p. m.—Gwendolyn Stephens, soprano.
8:30 p. m.—Miller, Piotti and Val, songs.
8:45 p. m.—Lanais Hawaiians.
9:30 p. m.—Henry Kost, tenor.
9:30 p. m.—Philip Pelz, cornetist.
9:45 p. m.—Hock and Jerome, songs.
11 p. m.—Caravan Orchestra.
11:30 p. m.—Rodeo Orchestra.
12 midnight—Kentucky Orchestra and Revue.

WMCA-NEW YORK CITY-341 11-12 a. m.—Ida Allen's Hour. 12-12:30 p. m.—Olcott Vail's String Ensemble.

6 p. m.—Olcott Vail's Ensemble.

6 p. m.—Olcott Vail's Ensemble.

6 p. m.—Frank Gibbia's Orchestra.

7 p. m.—Jack Wilbur's Personalities.

8 p. m.—Fred Ruzika, violinist.

8:30 p. m.—Sheppard Knapp Musicale.

9 p. m.—Lew Krueger's Orchestra.

10 p. m.—Minnle Well, planist.

10:30 p. m.—Minnle Well, planist.

10:45 p. m.—David Stokes, tenor.

10:45 p. m.—David Stokes, tenor.

10:45 p. m.—Ernle Golden's Orchestra.

WENY-NEW YORK CITY-259 0:30 a. m.—News. 0:30 a. m.—Women's Hour. 2:30 p. m.—Trio. 10 p. m.—Trio.

p. m.—Radio Reminiscences.

m.—"Whose Birthday To-day?"

p. m.—Sports results.

p. m.—Commerce of the Day.

p. m.—Law Series, Charles Vilas.

p. m.—History Series.

p. m.—"Theater Costume," Mrs.

mberton.

Pemberton.

8 p. m.—Roosevelt Orchestra.

8:15 p. m.—Opera Miniature,
Hood."

Hood."

9 p. m.—"Trailers," by C. E. Rauch.

9:15 p. m.—Sadrian Trio.

9:40 p. m.—Theater Magazine.

9:55 p. m.—"Sculpture," Alexander Zeitli

10 p. m.—"The Amateur vs. the B. C. L.

10:15 p. m.—Current Theater.

10:30 p. m.—Talk.

11 p. m.—"The Town Review." WEBJ-NEW YORK CITY-273

7 p. m.—Dan Barnett's Orchestra. 7:48 p. m.—Philip Krumholz, tenor. 8 p. m.—Railroad talk, Garrow Geer. 8:10 p. m.—Philip Krumholz, tenor. 8:20 p. m.—Amphion, Dance Orchestra. WFBH-NEW YORK CITY-273 2 p. m.—Johnny Basilone's Orchestra.
3 p. m.—Studio program.
4 p. m.—Scores (quarter hourly).
4:05 p. m.—Billy Baskette, Dave Kornstein.
4:30 p. m.—Billy Baskette, Dave Kornstein.
4:35 p. m.—William Sullivan, barytone.
5:0 p. m.—Leo Ford's Entertainers.
5:30 p. m.—Shall America Be Blue?"
5:45 p. m.—Flo and Dick Bernard, songs.
6:30 p. m.—Bossert Lumber Jacks.
6:30 p. m.—Bossert Lumber Jacks.
11:30 p. m.—Fordham Orchestra.

WHAP-BROOKLYN-240 WAHG-RICHMOND HILL, N. Y.—316
2 noon-Harry Dudley, songs. WGCP-NEWARK-252 2:45-5:30 p. m.—Songs; race results (half-hourly).

Wave
Length Orchestra
273 Arthur Kraus's
252 Strickland's
861 Janssen's

Eisenbourg's

Roseland Colonial Strickland's Dance music Messner

Harold Stern's Dance music Vincent Lopez's

### WEDNESDAY

WIJT-PHILADELPHIA-395 2-3 p. m.—Concert orchestra; recital. 1:30 p. m.—Talk; artist recital. 7:30 p. m.—Dream Daddy. 7:50 p. m.—Plays and players. 15 p. m.—Irwin Abrams's Orchestra. WFI-PHILADELPHIA-395

ire.

5 p. m.—Concert orchestra.

m.—Ross Gorman's Orchestra.

0 p. m.—"The Twins."

n. m.—"Eveready Hour."

p. m.—Grand opera, "11 Trovatore.'

WOO—PHILADELPHIA—508 a. m.—Grand organ. noon—Luncheon music. 12 noon—Luncneon music.
4:45 p. m.—Grand organ; trumpets.
7:30 p. m.—Dinner music.
WIP—PHILADELPHIA—508

WIP—PHILADELPHIA—6
6:45 a. m.—Setting-up exercises.
10 a. m.—Menu: Scott.
1 p. m.—Organ recital.
3 p. m.—University of Pennsylv chestra. chestra.

5:05 p. m.—Dinner music.

7 p. m.—Roll call; birthday list.

8 p. m.—Elliott Lester, critic.

8:15 p. m.—Talk, E. J. Lafferty.

8:30 p. m.—Ben Stad's Symphony Orches-

7:30 p. m.—Snelenburg Choral Society.

8 p. m.—Songe.
9 p. m.—Talk. Rev. John Stockwell.
9:15 p. m.—Entertainment.
9:30 p. m.—Harry Link, songs.
10:30 p. m.—Hally Hayer's Orchestra.
WPG—ATLANTIC CITY—300
1:30 p. m.—Ambassador Iuncheon music
6:45 n. m.—Organ recital.

WPG—ATLIANAN

1:30 p. m.—Ambassador luncheon mu
6:45 p. m.—Organ recital.

7 p. m.—Morton Trio.

8 p. m.—World Wide Excursions."

9 p. m.—Dual Trio.

10 p. m.—Organ recital. m.—Organ recital.
WHAR—ATLANTIC CITY—275 m.—Seaside Trio.
p. m.—Book review.
m.—Seaside Trio. p. m.—Seaside Trio.
1:15 p. m.—Strand organ recital.
1:15 p. m.—Strand organ recital.
20 p. m.—Organ recital.
20 p. m.—Address, Harold B. Tukey.

0 p. m.-W. Tupman's Orchestra. WRW-TARRYTOWN, N. Y.-273 p. m.—Musical program. 5 p. m.—Frank Lewis, pianist. 5 p. m.—Walter Harms, violinist 11:05 p m.—Oriole Orchestra.

WGR—BUFFALO—319 m.—Dinner music.
m.—Program same as WEAF.
WHAM—ROCHESTER—278

WHAM—ROCHESTER—263
3:30 p. m.—Eastman Theater Orches
5-6 p. m.—Theater organ.
6:15 p. m.—Dinner concert.
7 p. m.—Theater orchestra.
7:30 p. m.—Weather; market.
WJAR—FROVIDENCE—306 1:05 p. m.—Concert orchestra. 7:30 p. m.—"Musik Tawkalog. p. m.—"Musik Tawkalog."
10 p. m.—"Fire Prevention."
10 p. m.—Musical program.
30 p. m.—The Twins.
p. m.—"Eveready Hour."
WTIC—HARTFORD, CONN.—476
30 p. m.—Dinner music

p. m.—Dinner music.
m.—Contralto songs; scores.
m.—Studio program. WNAC-BOSTON-280 1 p. m.—Concert orchestra.
4 p. m.—Dance orchestra.
6:30 p. m.—WNAC Dinner Dance.
7:45 p. m.—Concert.

7:35 p. m.—Concert.

8 p. m.—Boston American Orchestra.

WEEL—BOSTON—349

2 p. m.—Dance orchestra; artists.
6:30 p. m.—Big Brother Club.
7:30 p. m.—Lost and found; scores.
7:40 p. m.—Talk, Judge LaRue Vredeiburgh. ourgh,
11 p. m.—Program same as WEAF,
WBZ—SPRINGFIELD, MASS.—333

WBZ-SPRINGFIELD, MASS,—333
6:30 p. m.—Reo Reisman's Ensemble.
7:15 p. m.—Market reports Orchestra.
8:15 p. m.—Charles Hector's Orchestra.
9:30 p. m.—Josephine Koch, soprano.
9:45 p. m.—William Brown, pianist.
10:00 p. m.—Alberta Kelleher, violinist,
WCTS-WORCESTER, MASS.—268
12:00-2:00 p. m.—Luncheon music. 12:00-2:00 p. m.—Luncheon music.
5:15 p. m.—Story Teller; scores.
8:00-8:30 p. m.—Ross Gorman's Orchestri
9:00-10:00 p. m.—"Everyeady Hour."
10:00-11:00 p. m.—Operatic concert.
WRC—WASHINGTON—469
10:00 a. m.—Wornen's Hour from WJZ.
12:00 (noon)—Organ recital.
1:00 p. m.—Mayflower Orchestra.
7:00 p. m.—Shoreham Orchestra.
8:00 p. m.—Musicale.

1:00 p. m.—Suscenam Orchestra. 8:00 p. m.—Musicale. 9:00 p. m.—Political situation. 9:30 p. m.—Musical program. 10:00 p. m.—"Over the Seven Seas." 10:30 p. m.—W. Spencer Tupman's Orchestra.

KDKA---PITTSBURGH---309 RDKA—PITTSBURGH—308 6:15 p. m.—Dinner concert. 7:30 p. m.—Children's period. - 8:30 p. m.—Travel talk; orchestra. 10:30 p. m.—Concert.

WEBJ 273 WMCA 841 WIP 508 WGBS 316 WJZ 455 WGY 861 WEAF 492 WMCA 492 WMCA 492 WMCA 361

WMCA WGCP WEBJ WTIC WLIT WHN WRW WAHG WJZ

WEDNESDAY

Amphions
Lew Krueger's
Pagoda
Arrowhead
Mayflower
Tupman's
Carsvan
Dance music
Ernie Golden's
Fordham
Kentucky

Arcady
Indianans
McLean's
Dance music
Boseiand
Koenig's
Zimmerman's

WEAF—NEW YORK CITY—492
6:45-7-7:20 a. m.—Health exercise.
10:45 a. m.—Home service talk.
11:05 a. m.—Aaron Hirsch, violinist.
11:15 a. m.—Health talk; violinist.
11:40 a. m.—Talk.
11:55 a. m.—Aaron Hirsch, violinist.
12 noon—Market and weather reports.
1:40 p. m.—World series game, play play description.
4-6 p. m.—Bay Nichols's orchestra.
6 p. m.—Dinner music. 8-5 p. m.—Hay Nichols's orchestra.
6 p. m.—Dinner music.
7 p. m.—Synagogue services.
7 p. m.—U. S. Army Band.
8 p. m.—The Buddies.
8:30 p. m.—"Pooley Period."
9 p. m.—Waterman's Points of Progress.
10 p. m.—Ipana Troubadours.
11-12 p. m.—Ben Bernie's Orchestra.

9:30 p. m.—F. wausworth, Career."
9:45 p. m.—William Lockwood, violinist.
10 p. m.—Sam Siegel, mandolin.
10:15 p. m.—William Lockwood, violinist.
10:30 p. m.—Clarence Williams's Trio.
11 p. m.—Flo Richardson's Orchestra. WJZ-NEW YORK CITY-455 0 a. m.—Women's hour. 0:40 a. m.—Talk by the Herald Tribun WAAM—NEWARK—268

11 a. m.—Happy Hour,
7 p. m.—Elmer Nippes Orchestra.
7:30 p. m.—Elmer Nippes Orchestra.
8 p. m.—Arthur Fischer, violinist.
8:15 p. m.—Thomas Hewson, tenor.
8:35 p. m.—Joe Furtner. Anthony Schred
9:05 p. m.—Olivette Wilhelm, soprano.
9:40 p. m.—McGregor Brown, barytone.
10 p. m.—Claude Rhy's Orchestra. 2. 4, 5:15, 8 and 10:25 p. m.—News.
4-6 p. m.—Scores, racing (half-hourly)
4:05 p. m.—Honest Ballot Association.
5:15 p. m.—News, baseball, racing.
5:26 p. m.—Market reports.
5:50 p. m.—Barket reports.
5:50 p. m.—Barket reports.
6:45 p. m.—Judge jr.
7 p. m.—Bernard Levitow's concert.
8 p. m.—Scores, racing results.
8:15 p. m.—Zoological Society series.
8:30 p. m.—New York Edison hour.
9:30 p. m.—Princeton football team. 2:45 p. m.—Songs; race results hourly).

10 p. m.—Radio Franks. 10:30 p. m.—Monte Carlo Virginians.

WNYC—NEW YORK CITY—526
2 p. m.—World's series games.
7 p. m.—Market high spots.
7.10 p. m.—Colonial Dance Orchestra.
7.30 p. m.—Police alarms.
7.35 p. m.—Colonial Dance Orchestra.
8 p. m.—Eiementary Spanish lessons.
8.30 p. m.—Advanced Spanish lessons.
9 p. m.—Two-piapo numbers.
9:20 p. m.—Cantor Sol Fuchs, baryto Cantor Grodenor, tenor; Harry Needylolinist.

10:30 p. m.—Police alarms; weather. WMCA—NEW YORK CITY—341

WMCA—NEW YORK CITY—341
12 (noon)—Olcott Vail Ensemble.
6 p. m.—Olcott Vail Ensemble.
6 p. m.—Ernie's Golden's Orchestra.
7:30 p. m.—Trouverian Quartet.
8 p. m.—Frieda Rochen, Boprano.
8:30 p. m.—Talk.
8:45 p. m.—Jack Smiles.
9 p. m.—Arcady Orchestra.
10 p. m.—Eugene Le Pique, pianist.
10:45 p. m.—Musical program.
11:30 p. m.—Jack Smith, barytone.
12 p. m.—Serenaders.

12 p. m.—Serenaders.
WRNY—NEW YORK CITY—259

7.65 p. m.—"Whose Birthday To-day?"
7.05 p. m.—Sports results.
7.15 p. m.—Commerce of the day.
7.20 p. m.—Code lesson.
7.35 p. m.—"Inventions."
7.45 p. m.—"Composers," Mrs. Henry

ley.

8 p. m.—Dr. Spaeth's Artists.

8:30 p. m.—Pictorial review.

8:45 p. m.—Samuel Polansky, violinist.

9 p. m.—'How to Tune a Radio Set."

9:16 p. m.—"Egyptian Buildings," H. Corhett.

bett.
9:20 p. m.—Percussion demonstration.
9:30 p. m.—Aviation series.
9:45 p. m.—Kazinoff and Hart, pianists.

10 p. m.—Meta Christenson; Irving Qu. 10:30 p. m.—Biography series.

WEBJ—NEW YORK CITY—273

8 p. m.—Aywon Comedy Four.
8:30 p. m.—Carrie Cohen, planist.
8:45 p. m.—Roth Trio.
9:10 p. m.—Carrie Cohen, planist.
9:20 p. m.—McLean's Dance Orchestra.
WFBH—NEW YORK CITY—273

2 p. m.—Richard Douglas, ukulele.
2:15 p. m.—Studio program.
3 p. m.—Frank Gebbias Orchestra.
4 p. m.—Scores (one-quarter hourly).
4:05 p. m.—Henee Schleber, soprano.
4:15 p. m.—Studio program.
5 p. m.—Jerry Antone's Orchestra.
6 p. m.—Chris Meehan, tenor.
6:15 p. m.—Majestic String Ensemble.
7:50 p. m.—Sam Perry, Richard Erlbach.
7:55 p. m.—Takk.

WOO 508 WEAF 492 WHN 361 WOR 405 WMCA 341

WOKO 283 WIP 508 WHN 861 WRC 469 WPG 300 WRNY 259 WGBS 316 WNYC 841 WMCA 841 WHN 861 WJZ 492 WHN 461 WHN 461 WHY 453

WLIT 395 WRW 273 WAHG 316

THURSDAY

FRIDAY

Dance music Ben Bernie's Dance music Flo Richardson

The Amphions
Dance music
Caravan
Meyer Davis's
Dance music
California
Arrowhead
H. Stern's
Ernis Golden's
Swanee
Jacques Green's
Vincent Lopez's
Ted Lewis's

hourly).

3:45 p. m.—Carence Williams's Trio.

4:35 p. m.—Rob Ward's little Wards.

4:35 p. m.—Bob Ward's little Wards.

4:30 p. m.—Songs.

8:15 p. m.—Andy Razaf Trio.

8:30 p. m.—Dick and Flo Bernard, songs.

8:45 p. m.—Marcel Doublier, saxophonist.

9 p. m.—William J. Rietz, songs.

9:15 p. m.—Indianans' Orchestra.

10 p. m.—Sam Williams, Al Plantodosi.

10:15 p. m.—Strickland's Orchestra.

WIP.—PHIL ADEL PHI A. 508 WGBS—NEW YORK CITY—316 0 a. m.—Timely talks. 0:10 a. m.—Don Clark, "Song Factory. 0:20 a. m.—Furniture talk; songs. 10:20 g. m.—Furniture talk; songs.
10:40 a. m.—Beauty talk; songs.
10:40 a. m.—Beauty talk; songs.
1:30 p. m.—Scripture reading.
1:35 p. m.—Al Rossback, Judith Roth.
2 p. m.—World series returns.
3 p. m.—Interview.
3:10 p. m.—Bach & Handel program.
3:40 p. m.—Interview with Anna Chandl
3:50 p. m.—Bach-Handel program.
6 p. m.—Uncle Geebee.
6:30 p. m.—Sorey Concert Orchestra.
7 p. m.—'Movie Sidelights."
1:10 p. m.—Vincent Sorey wip-Philadelphia-508

WIP—FILE PROPERTY OF THE PROPE WOO-PHILADELPHIA-508 1 a. m.—Grand organ. 2 noon—Luncheon music. :45 p. m.—Grand organ; trumpets. :30 p. m.—Dinner music. ) p. m.—Dinner music. m.—United States Army Band... ) p. m.—"Pooley Period." ) p. m.—Waterman's Points of Prog 2:45 p. m.—Grossman and Meredith, sor 3 p. m.—Harry Spear, tenor.
3.45 p. m.—Charles Thomee, pianist.
4 p. m.—Andy Razat, "Melody Man."
4:15 p. m.—Mae Goodreson, poems.
4:20 p. m.—Silvio Dirlenzo, pianist.
4:25 p. m.—Miriam Gordon, recitations.
4:30 p. m.—Herman Streger's Players.
7:30 p. m.—Herman Streger's Players.
7:30 p. m.—Herman Streger's Players.
8:15 p. m.—Harly Horowitz, planist.
8:15 p. m.—Paul Jordon, songs.
8:25 p. m.—Fanny Horowitz, planist.
8:30 p. m.—Dr. David De Pool.
8:35 p. m.—George Hirose, barytone.
9 p. m.—Perry Bradford's Entertainers.
9:15 p. m.—Emmerson Ruger, songs.
9:30 p. m.—Jean Moresco, tenor.
9:45 p. m.—Emmerson Ruger, songs.
11 p. m.—Revue and orchestra.
11 p. m.—Reveue and orchestra.
11 p. m.—Revue and orchestra.
11 p. m.—Ted Lewis's Orchestra.
11 p. m.—Ted Lewis's Orchestra.
11 p. m.—WYC—NEW YORK CITY—528

WFI-PHILADELPHIA-395 8 p. m.—Artists' recital. 3:45 p. m.—Eleanor Gunn Fashion P. 6:45 p. m.—Concert orchestra. WLIT—PHILADELPHIA—395
12:05 p. m.—Organ recital 2:05 p. m.—Organ recital; orchestra.
1-3 p. m.—Concert orchestra; recital.
1:30 p. m.—Concert orchestra; recital.
1:30 p. m.—Talk; artists' recital.
1:50 p. m.—Scores; sports results.
1:30 p. m.—Dream Daddy.
1:15 p. m.—Concert orchestra.
1:30 p. m.—Artists' recital.
1:0 p. m.—Dance orchestra.
1:0:30 p. m.—Popular program.
10:30 p. m.—Popular program.

WAHG-RICHMOND HILL-316

WOR-NEWARK-405

WAAM-NEWARK-263

WGCP-NEWARK-252

6:45-7:15-7:45 a. m.—Gym class. 2:45 p. m.—World series game

WCAU—PHILADELPHIA—278 3-4 p. m.—Program from radio show.
7 p. m.—Lew Chapman's Orchestra.
8 p. m.—Program from radio show; "Happiness Boys."
9 p. m.—"Health" talk, Dr. Herbert God9 p.
dard,
9:10 p. m.—Songs.

9:10 p. m.—Songs.

WPG—ATLANTIC CITY—300
2:30 p. m.—World's series, play by play.

WGY—SCHENECTADY, N. Y.—380
2 p. m.—World's series baseball game.
6:30 p. m.—Program for children.
6:45 p. m.—Albany Theater Orchestra.
7:35 p. m.—"Book of Knowledge."

7:35 p. m.—Book of Knowledge."

WRW—TARRYTOWN, N. Y.—273

10:05 p. m.—Nicholas Koenig's Orchestra

10:30 p. m.—Gordon MacMunn, songs.

10:45 p. m.—Jack Smiles, monologue.

11:05 p. m.—Koenig's Orchestra WGR-BUFFALO-319 2:30 p. m.-World's series game, play.
6:30 p. m.—Two-piano recital.
8:45 p. m.—"Gaps in Education."
9-11 p. m.—Program same as WEAF.
11 p. m.-1 a. m.—Supper music.

WHAM-ROCHESTER, N. Y.-278 3:30 p. m.—Eastman Theater Orchest 5-6 p. m.—Theater organ. 7 p. m.—Theater orchestra. 7:30 p. m.—Weather; market report. WJAR-PROVIDENCE-306

10 a. m.—Housewives' exchange.
1.45 p. m.—World series game.
7.30 p. m.—United States Army Band.
9 m.—Waterman's Points of Progress.
10 p. m.—'Your Hour." WTIC-HARTFORD, CONN.-476 2 p. m.—World's series, play by play. 6:30 p. m.—Dinner music. 6:45 p. m.—Weather report; scores. 7:20 p. m.—Dinner music.

0 p. m.—Dinner music. WEEI-BOSTON-

WEEL-ROSTON—349
6:45 a. m.—Health exercises.
10:45 a. m.—Home service talk.
2 p. m.—Dance orchestra; artists.
5:30 p. m.—Middleton Arm Orchestra.
6:30 p. m.—Big Brother Club.
7:20 p. m.—Lost and found, scores.
7:30 p. m.—C. B. Collins, tenor.
8-11 p. m.—Program same as WEAF.

WNAC-BOSTON-280 WNAC—BOSTON—280

10:30 a. m.—Bible readings; women's
12:15 p. m.—Noon service.
1 p. m.—Concert orchestra.
4 p. m.—Dance orchestra.
4:20 p. m.—Vocal and piano solos.
6 p. m.—Kiddies' Club.
6:30 p. m.—WNAC dinner dance.
7:35 p. m.—Metropolitan Theater.
7:45 p. m.—Concert program.
8:30 p. m.—Bostonia Trio.

Dance music Geiger's Roseland Ed Hirsch's Ben Glaser's

Dance music Biltmore

Alabam Fordham's

Serenaders
Arrowhead
Dance music
Crandall's
Ernie Golden's
Vincent Lopes's
Ernie Golden's
Ernie Golden's
Ferrucci's

Meyer Davis's Vincent Lopez's

WCAP 469
WAAM 263
WHM 341
WMCA 341
WJZ 455
WPG 800
WJAR 806
WEAF 492
WGR 319
WHN 861
WFBH 273

WEEI
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WPG
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WEAF
WMCA
WFBH
WRNY

SATURDAY

10:30 11:00 11:12

WBZ-SPRINGFIELD, MASS.-333 12 noon—Harry Dudley, songs.
7:30 p. m.—Thornton Fisher, sport talk.
7:45 p. m.—Joe Zimmerman, pianist.
8 p. m.—Arthur Cole, tenor.
8:15 p. m.—Louise Weltman, Mischa Tulir 30 p. m.—Dinner concer 15 p. m.—Market report

duets.

8:30 p. m.—Marguerite Behling, soprano.

8:35 p. m.—Arthur A. Feldman, entertaine

9 p. m.—Joe Zimmerman, pianist.

9:15 p. m.—Artists' recital.

10 p. m.—Herman Fisher, reader.

10:15 p. m.—Zimmerman's orchestra. .-Concert program.
WRC-WASHINGTON-469 2:45 p. m.—World series game play play.
6:15 p. m.—'Words Mispronounced.''
6:17 p. m.—Dinner music.
7:05 p. m.—Talks by aviators,
7:15 p. m.—'Sports,'' Bill Wathey,
7:30 p. m.—Vincent Lopez Orchestra.
8 p. m.—'Topics of the Day.''
8:15 p. m.—Carmen Concert Trio.
9 p. m.—Morton Gould, pianist.
9:15 p. m.—Sam Siegel, mandolin.
9:30 p. m.—F. Wadsworth, ''Selecting Career.''

m.—Play by play world series gas WCAP—WASHINGTON—469 p. m.—Ipana Troubadours. KDKA—PITTSBURGH—309 i:15 p. m.—Dinner concert, i:30 p. m.—Children's period. :30 p. m.—Concert.

### THURSDAY

WJZ-NEW YORK CITY-455 0 a. m.—Women's hour.
p. m.—Nathan Aba's Orchestra.
4.5:15.8 and 10:30 p. m.—News.
6 p. m.—Scores, racing (half-hourly)
105 p. m.—Tea music.
120 p. m.—News, baseball, racing.
120 p. m.—Market reports. 12:05 p. m.—Organ recital; orchestra. 2 to 3 p. m.—Orchestra; artist recital. 4:30 p. m.—Artist recital. 5:50 p. m.—Scores; sports results. p. m.—News, baseball, racing. 5:26 p. m.—Market reports. 5:50 p. m.—Market reports. 5:50 p. m.—Brinancial summary. 5:01 p. m.—Baseball, racing returns. 7 p. m.—Bernhard Levitow's concert. 7:55 p. m.—'She Knew Mrs. Washingt. 8 p. m.—Scores, racing results. 8:05 p. m.—Honest Ballot Association. 5:15 p. m.—United States Army Band. 9:30 p. m.—Royal hour of music. 11 p. m.—Jacques Green's Orchestra, w. Clark's Hawaiians. WCAU—PHILADELPHIA—278
6:30 p. m.—Billy Hayes's Orchestra,
7:30 p. m.—N. Snellenburg's Orchestra,
8 p. m.—Chaminade concert,
9 p. m.—Songs,
10 p. m.—Sesqui Centenniai hour,
WPG—ATLANTIC CITY—300

WPG—ATLANTIC UII X—SUU
130 p. m.—Morton luncheon music.
2:30 p. m.—World's Series, play by play
1:30 p. m.—Afternoon tea music.
5:30 p. m.—'Billy' Rocap; sports.
6:45 p. m.—Organ recital. WEAF-NEW YORK CITY-492

WEAF—NEW YORK CITY—492
6:45-7:20—Health exercises.
11 a. m.-12 noon—"Housewives Hour";
musical program and speakers.
12 noon—Market and weather reports.
140 p. m.—World series game, play by
play description.
15 p. m.—George Knisely, barytone.
15 p. m.—George Knisely, barytone.
15 p. m.—George Knisely, barytone.
15 p. m.—Musical program.
15 p. m.—Dinner music.
16 p. m.—Mid-week services; Aida Brass
Quartet; address by Rev. Samuel H.
15 p. m.—Serenaders

m.—Studio Concert.
WGY—SCHENECTADY—380 30 p. m.—Serenaders, p. m.—"The Larkinites, 3 p. m.—"The Larkinites."

3:30 p. m.—"Touring"; George Cooley.

9 p. m.—Henri Berchman's Orchestr.

opera quartet, assisting.

10 p. m.—Silvertown Orchestra.

11-12 p. m.—Vincent Lopez's Orchestra. p. m.—United States Army Band. 10 p. m.—Royal Hour.
11:30 p. m.—Organ recital.
WWW—TARRYTOWN, N. Y.—273
9:05 p. m.—Musical program; sports.
9:40 p. m.—WRW Entertainers.
10:05 p. m.—Recital.
10:30 p. m.—Entertainers.
11:05 p. m.—Royal Orchestra.
WGR—BUFFALO, N. Y.—319
2:30 p. m.—World Series game, play
play. WJY-NEW YORK CITY-405 7:30 p. m.-Vanderbile O-1

7:30 p. m.—Vanderbilt Orchestra.

10 a. m.—Timely Talks with Terese.
10:10 a. m.—Mary Mullen, planist.
10:20 a. m.—Mousehold talk; plano.
10:30 a. m.—Musehold talk; plano.
10:30 a. m.—Mary Mullen.
1:30 p. m.—Scripture reading.
1:35 p. m.—Midlered Burke, soprano.
2 p. m.—World series returns.
3 p. m.—Widlered Burke, soprano.
2 p. m.—World series returns.
3 p. m.—World series returns.
3 p. m.—World harriet Comst.
3:10 p. m.—"Woman in Home" hour.
6 p. m.—Uncle Geebee.
6:30 p. m.—Arthur Hand, barytone.
6:40 p. m.—Jefferson," Joseph Lewis.
6:50 p. m.—Weekly news.
7 p. m.—Voltare hour.
8 p. m.—Hazel Griggs, planiste. p. m.—Dinner music. 11 p. m.—Program same as WEAF, WHAM—ROCHESTER, N. Y.—278, 10 p. m.—Eastman Theater Orchestra, p. m.—Theater Orchestra. :30 p. m.—Market report WJAR—PROVIDENCE---306

WJAR—PROVIDENCE—306
1:45 p. m.—World Series game.
8 p. m.—"The Larkinites."
8:30 p. m.—Musical.
9 p. m.—"Radio Artists."
10 p. m.—Silvertown Orchestra.
WTIC—HARTFORD, CONN.—476 WHN-NEW YORK CITY-361 p. m.-Marsh McCurdy, organism

WMCA-NEW YORK CITY-341
2 (noon)—Olcott Vail's String Ensemble
p. m.—Olcott Vail's Ensemble
1.30 p. m.—Mario Alvarez, tenor.
p. m.—Sunnyside Orchestra
1.30 p. m.—Lanson's Orchestra
1.30 p. m.—Elsie Johnson. soprano.
1.30 p. m.—Snedden Welr, barytone.
p. m.—Elsie Johnson. Peter De Rose an
1.30 p. m.—Marguerite Sterns, soprano.
1.30 p. m.—Marguerite Sterns, soprano.
1.30 p. m.—Bobert Chree, barytone.
1.30 p. m.—Joseph Wetzel, 'tenor.
1.31 p. m.—Ernie Golden's Orchestra.
1.32 WNYC—NEW YORK CITY FOR

MNYC—NEW
m.—World's Series games.
m.—Market high spots.

Arcady Orchestra. WNYC-NEW YORK CITY-526

soprano. 0:10 p. m.—'Trend of the Times," 0:30 p. m.—Police alarms; weather 0:35 p. m.—Harold Stern's Orchestr

10:35 p. m.—Harold Stern's Orchestra.

9:45 a. m.—News fiashes.
10:30 a. m.—News fiashes.
10:30 a. m.—Program for women.
12:30-1:30 p. m.—Trio.
4:15 p. m.—Studio program.
7 p. m.—Ywhose Birthday To-day?"
7:05 p. m.—Sport fiashes.
7:15 p. m.—Sport fiashes.
7:15 p. m.—Commerce of the Day.
7:30 p. m.—Kiddie Music Party.
7:45 p. m.—Joseph Pavloff.
8 p. m.—Rooseveit Orchestra.
8:15 p. m.—Rooseveit Orchestra.
8:15 p. m.—Roseveit Orchestra.
8:30 p. m.—Radio questions and answe
8:45 p. m.—Bob Ward's Little Wards.
9:15 p. m.—Bob Ward's Little Wards.
9:15 p. m.—Bob Ward's Little Wards.
9:30 p. m.—Essays, Philosophy.
9:33 p. m.—Judith Roth, songs.
9:45 p. m.—Gesta Crowell's Theatre.
10 p. m.—California Orchestra.
WFBH—NEW YORK CITY—273

WFBH-NEW YORK CITY-278

dare.

3:80 p. m.—Johnny Gerhardts' Orchest
4 p. m.—Scores (quarter hourly).

4:30 p. m.—Marion Doran, soprano.

4:45 p. m.—Arthur Kraus' Orchestra.

5:30 p. m.—Volley Endrias, contraito.

5:45 p. m.—Jack Rafferty, recitations.

6 p. m.—Bob Schaeffer, Fred Fisher,

songs.

songs.

| 230 p. m.—Theo. Alban, songs.
| p. m.—Kathryn Connelly, soprane.
| 125 p. m.—Paul Epp's Revellers.
| WOKO—NEW YORK CITY—232
| 110 p. m.—Earl Palmer, tenor.
| 125 p. m.—Helen Herman, contraito.
| 125 p. m.—Jerome Lama, musical saw
| 110 p. m.—Lee White, Jerry Alexan
| 126 p. m.—Lee White, Jerry Alexan
| 127 p. m.—Lee White, Jerry Alexan
| 128 p. m.—Lee White, Jerry Alexan
| 129 p. m.—Lee White, Jerry Alexan
| 129 p. m.—Lee White, Jerry Alexan
| 129 p. m.—Lee White, Jerry Alexan
| 120 p. m.—Lee White, Jerry Alexan

songs. :30 p. m.—Billy Ihlefeld's Amphions. WHAP—BROOKLYN—240

7 p. m.—Dinner Music. WBBR—STATEN ISLAND, N. Y.—273

1.—Agnes Brennan, soprano.

b. m.—Studio Programme.

m.—Radioviews by Mrs. Owen

i.10 p. m.—Market high spots.

1:10 p. m.—Arcady Orchestra.

1:30 p. m.—Police alarms.

1:35 p. m.—Arcady Orchestra.

1:15 p. m.—James La Magna, wiolinist.

1:25 p. m.—John Brawley; James Bren

nan, cornetist.

cum.
7:45 p. m.—Dinner music.
WEEI—BOSTON—349 WHN—NEW YORK CITY—361
12:30 p. m.—Marsh McCurdy, organist.
3:15 p. m.—Lexington Theater Orchestra.
4:30 p. m.—Miller, Piotti and Val, songs.
7 p. m.—Iceland Orchestra.
7:30 p. m.—Cecil Kennedy's Quintet.
8 p. m.—Oakland's Chatheau Shanley.
8:30 p. m.—Dick and Flo Bernard, songs.
8:45 p. m.—Fitzpatrick Brothers, singing.
9 p. m.—Jimmy Clarke's Entertainers.
9:230 p. m.—Joseph Turkel, tenor.
9:45 p. m.—Loew's vaudeville,
10 p. m.—Caravan Orchestra.
11 p. m.—Caravan Orchestra.
11 p. m.—Swanee Orchestra.
11 p. m.—Swanee Orchestra.
12 p. m.—Ted Lewis's Orchestra.
WMCA—NEW YORK CITY—341
12 (noon)—Olcott Vall's String Ensemble. p. m.—Joe Herman's Orchestra.
) p. m.— Big Brother Club,
p. m.—Lost and Found; scores,
p. m.—Musicale.

8-11 p. m.—Program same as WEAF.
WNAC—BOSTON—280
10:30 a. m.—Bible readings; Women's Cl 10:30 a. m.—Noon service.

12:15 p. m.—Noon service.

1 p. m.—Concert orchestra.

1:50 p. m.—Popular songs.

4 p. m.—Dance orchestra.

6:30 p. m.—WNAC Dinner Dance.

6:35 p. m.—Massachusetts Co-

:45 p. m.-Songs; Race Results (half

hourly). 3:30 p. m.—Paul Denniker's Orchestra. WOO—PHILADELPHIA—508

:45 p. m.—Organ and trumpets. :30 p. m.—Dinner music. WIP—PHILADELPHIA—508

6:45 a. m.—Setting-up exercises.
7 a. m.—Setting-up exercises.
1 p. m.—Luncheon music.
6:05 p. m.—Pagoda Orchestra.
7 p. m.—Rool call and birthday list.
8 p. m.—Music of Beethoven.
8:30 p. m.—Twins and concert quarte
10 p. m.—Dance music.
WFI—PHILADELPHIA—395

p. m.—Silvertown Orchestra. WLIT—PHILADELPHIA—395

p. m.—Dream Daddy. WCAU—PHILADELPHIA—278

p. m.—Dance orchestra.
WHAR—ATLANTIC CITY—275

p. m.—Seaside Trio.
0 p. m.—Lecture period.
c. m.—Seaside Trio.

p. m.—The Darkintes. :30 p. ni.—"Pop" concert. p. m.—Radio artists.

130 p. m.—WAAC Dinner Dance.
145 p. m.—Massachusetts Co-operati
Bank League Convention.

WBZ—SPRINGFIELD, MASS.—333
130 p. m.—Leo Reisman's Ensemble.
150 p. m.—Market report.
150 p. m.—Children's Chorus.
145 p. m.—Evening of opera, presenting the second of the second

'Faust."
WCTS-WORCESTER, MASS.-268 p. m.—"The Larkinites."
30 p. m.—Program from WEAF. J-11 p. m.—Silvertown Orcased WRC—WASHINGTON—469

12 noon—Organ recital.
1 p. m.—Washington Orchestra.
7 p. m.—Shoreham Orchestra.
1 so p. m.—U. S. Army Band.
9 p. m.—Royal Hour of Music.
10 p. m.—Meyer Davis's Band.
KDKA—PITTSBURGH—309 nan, cornetist.
1:10 p. m.—Martha Weiss, pianist.
1:20 p. m.—Martha Weiss, pianist.
1:30 p. m.—Martha Weiss, pianist.
1:30 p. m.—Martha Weiss, pianist.
1:30 p. m.—KDKA Little Synchestra.
1:30 p. m.—Might Concert.
1:30 p. m.—Midnight concert. 7:30 p. m.—Children's period. 8:30 p. m.—KDKA Little Symphony

### FRIDAY

WJZ—NEW YORK CITY—455

10 a. m.—Women's hour.

11 a. m.—News.

1 p. m.—Ambassador Trio.

2, 4, 5:15, 8 and 10:25 p. m.—News.

#-6 p. m.—Scores, racing (half hourly).

4:05 p. m.—Ta music.

5:15 p. m.—Baseball, news, racing.

5:26 p. m.—Market reports.

5:50 p. m.—Financial summary.

6:01 p. m.—Baseball, racing returns.

7 p. m.—Bernhard Levitow's Concert.

8 p. m.—Scores, racing returns.

8:30 p. m.—Cogate program.

10:30 p. m.—Een Glaser's Orchestra. 10:30 p. m.—Golgate propagate.

10:30 p. m.—Ben Glaser's Orchestra

WJY—NEW YORK CITY—405

7:30 p. m.—Irwin Abrams's Orchestr

8:30 p. m.—Honest Ballet Associatio

8:40 p. m.—The Texans. WGBS—NEW YORK CITY—316

a. m.—Timely Talks with Terese.
0:10 a. m.—Henry Rogers, pianist.
0:20 a. m.—Readings; piano solos.
0:40 a. m.—Household Talk; piano.
380 p. m.—Scripture Reading.
25 p. m.—Bob Platz, pianist.

1.35 p. m.—Bob Piatz, planist.

2 p. m.—Agnes Moes, soprano.

3 p. m.—Interview with Dorothy Raymond St. 10 p. m.—Hanna Margoles, planist.

3:20 p. m.—Talk on furniture; plano.

3:40 p. m.—Plano harmony; solos.

6 p. m.—Uncle Geebee.

6:30 p. m.—Jule Anzel's Orchestra.

7 p. m.—"What's Your Radio Problem?

7 p. m.—"What's Your Radio Problem?

7 p. m.—"What's Your Radio Problem?"
77:10 p. m.—Jule Anzel's Orchestra.
WNYC-NEW YORK CITY—526
2 p. m.—World Series Game.
7 p. m.—Market High Spots.
7 do p. m.—Pearl Miller, soprano.
7:30 p. m.—Police Alarms
8 p. m.—Board of Estimate Meeting.
8 p. m.—Board of Estimate Meeting.
8 p. m.—Hementary French Lessons.
8 30 p. m.—Anna Pinto, harpist; R. Smith.
pianist; Grif Teller, fautist.
9 p. m.—Rudolph Joskowitz, violinist.
10:15 p. m.—Police Alarms, weather.

WEAF—NEW YORK CITY—492
6:45-7-7:20-7:45 a. m.—Health exercises.
10:45 a. m.—Home service talk.
11:05 a. m.—Norman Curtis, pianist.
11:15 a. m.—Talk to women; piano.
11:35 a. m.—Talk; piano solos.
12 noon—Market and weather reports.
1:40 p. m.—World series game, play by, play description.

WAHG-RICHMOND HILL, N. Y.—316
12 noon—Musical program.
WOR—NEWARK—405
6:45-7:15-7:45 a. m.—Gym Class.
2:45 p. m.—Play by Play World Series.
6:15 p. M.—"Words Mispronounced."
6:17 p. m.—Shelton Dinner Music.
7:05 p. m.—Talks by Aviators.
7:15 p. m.—"Sports," Bill Wathey.
WAAM—NEWARK—263
11 a. m.—Happy Four Program.
WGCP—NEWARK—252
2:45 p. m.—Songs: Race Results (half 1:40 p. m.—World series game, play by play description.

4.15-5 p. m.—Uohn Ricci, pianist.

4:15-5 p. m.—Lillian Bucknam, soprano.

6 p. m.—Dinner music.

7 p. m.—Gene Ingraham's Orchestra.

7:30 p. m.—Story teller.

7:45 p. m.—Irbs Torn, pianist.

8 p. m.—Irbs Torn, pianist.

8 p. m.—Tab Forn, pianist.

9 p. m.—Bagle Trio.

9 p. m.—Home Entertainers.

10 p. m.—Operatic solos by vocalists and string quartet.

11-12 p. m.—Meyer Davis's Orchestra.

WŁWIL—NEW YORK CITY—238

8 p. m.—Talk on literature; talk on "Marriage and Divorce."

WRNY—NEW YORK CITY—250

riage and Divorce."

WRNY-NEW YORK CITY-259

9:45 a. m.—News flashes.
10:29 a. m.—Tuning signal.
10:30 a. m.—Program for women.
12:30-1:30 p. m.—Trio.
4:15 p. m.—Larsen Violin Ensemble.
7 p. m.—Whose Birthday To-day?"
7:05 p. m.—Sport flashes.
7:15 p. m.—Commerce of the Day.
7:20 p. m.—Code lesson.
7:45 p. m.—Commerce of the Day.
7:20 p. m.—Code lesson.
7:45 p. m.—Whose Michael W. McCann, "Foods."
8 p. m.—Opera, "Il Trovatore."
8:35 p. m.—Band concert.
8:45 p. m.—"What's New in Radio?"
9 p. m.—Opera. "Carmen."
9 p. m.—Opera. "Carmen."
9 p. m.—Opera. "Carmen." p. m.—Tearoom ensemble, p. ni.—Radio show children's program, 45 p. m.—Concert orchestra, p. m.—"The Larkinites." pression."

10 p. m.—"Carmen," Ralph Christman.

10:15 p. m.—Uptown Revel. WMCE-NEW YORK CITY-341

WMCE—NEW YORK CITY—341
12 noon—Olcott Vail's Ensemble.
6 p. m.—Olcott Vail's Ensemble.
6:30 p. m.—Ernie Golden's Orchestra.
7:30 p. m.—Theo Alban, tenor.
8 p. m.—"We Women," Betty Brainerd.
8:10 p. m.—Pierre Harrower, barytone.
8:30 p. m.—John Klingerfeld, readings,
8:45 p. m.—Richard Douglas, songs.
9 p. m.—Hardman hour of music.
10 p. m.—'How to Drive Automobiles."
10:33 p. m.—Ed Hirsch's Orchestra.
11:15-11:45 p. m.—Donald Flamm, critic.
WHN—NEW YORK CITY—361 p. m.—Organ recital.
p. m.—Traymore Concert Orchestra

WHN-NEW YORK CITY-361 2:15-3:15 p. m.—Musical program.
3:45 p. m.—Musica nd songs.
4:15 p. m.—Slivio Dirlenzo, pianist.
4:30 p. m.—Herman Streger's Orchestra.
7:30 p. m.—Burr McIntosh, "Philosopher.
8 p. m.—Cantor Sol Fuchs, songs.
8:15 p. m.—Leonard Strickler, pianist.
8:30 p. m.—Johnny Tucker, songs.
9:30 p. m.—Frank Ochs, tenor. :45 p. m.—Frank Ochs, tenor. :45 p. m.—Steele and Hegmey, songs. 0:30 p. m.—Roseland Dance Orchestra

p. m.—Rodeo Orchestra. 1:30 p. m.—Alabam Orchestra. 2 midnight-12:30 a. m.—Revu WEBJ-NEW YORK CITY-273
WEBJ-NEW YORK CITY-273 p. m.—Blenheim Theatre Ensemble. 45 p. m.—Eddle Burke, piper. 55 p. m.—Isabel Henderson, soprano. 20 p. m.—Eddie Burke, piper. 30 p. m.—Leon H. Fox, vlolinist. WFBH—NEW YORK CITY—273
m.—Arthur Kraus's Orchestra.
m.—Studio program.
p. m.—Lipton's Music Masters.

m.—Scores, quarter hourly.
m.—Pete Leonard's Orchestra.
m.—Billy Johnston's Orchestra.
0 p. m.—Fordham Orchestra. WHAP—BROOKLYN—240 WAHG-RICHMOND HILL, N. Y.-310

12 (noon)—Musical Program.
7:30 p. m.—Thornton Fisher, sport talk,
7:45 p. m.—Maude Mason, pianist.
8 p. m.—Hazel F. Bailey, soprano.
8:15 p. m.—Hearl F. Bailey, soprano.
8:30 p. m.—Prof. Mayne, "Speech."
8:45 p. m.—Edgar Gruen, tenor.
9 p. m.—Artists' recital.
10 p. m.—Radio Question Box.
10:15 p. m.—Andy Asciutto's Orchestra. WOR—NEWARK—405
6:45, 7:15, 7:45 a. m.—Gym class,
2 p. m.—Play by play of world series,
6:15 p. m.—Words Mispronounced."
6:17 p. m.—"Sports," Bill Wathey.
6:30 p. m.—Talks by aviators,
7:05 p. m.—Shelton dinner music.

wAAM—NEWARK—263

11 a. m.—Happy hour.
11:15 a. m.—Cooking school.
11:45 a. m.—Marinello Girl.
11:45 a. m.—Happy hour.
7 p. m.—Hopes's Melody Boys.
7:30 p. m.—Sport oracle.
7:45 p. m.—Hopes's Melody Boys.
8:15 p. m.—H. W. Waible, pianist.
8:30 p. m.—John B. Mark, violinist.
8:45 p. m.—Dorothy Degnan, soprano,
9:05 p. m.—John B. Mark, violinist.
9:20 p. m.—H. W. Waible, pianist.
9:35 p. m.—Talk on New Jersey.
9:55 p. m.—Halk on New Jersey.
9:55 p. m.—Hida Kay, contralto.
10:20 p. m.—Gelger's Dance Orchestra.

WGCP—NEWARK—252 m.—Songs; race results (half 2:45 p. m.—Songs; race results (h. hourly).
3 p. m.—Dick and Flo Bernard, songs.
3:15 p. m.—Perry Bradford, Phil Worde 9:15 p. m.—Shirley Herman, singer.
9:30 p. m.—'Ukelele Bob' McDonald.
9:45 p. m.—Arthur Gaines, tenor.
10 p. m.—Isabelle Henderson, soprano.
10:15 p. m.—Theo. Alban.
10:30 p. m.—Strickland's Orchestra.
WIP—PHILADELPHIA—508

6:45 a. m.—Setting-up exercises.
10 a. m.—"Menu," Mrs. Scott.
1 p. m.—Luncheon music.
6:05 p. m.—Dinner music.
7 p. m.—Bedtime story.
WOO—PHILADELPHIA—508 WOU—PHILADELPHIA—008
11 a. m.—Grand organ.
12 (noon)—Luncheon music.
1:45 p. m.—Grand organ; trumpets.
7:30 p. m.—Dinner music.
8 p. m.—Military band.
8:45 p. m.—Artists and orchestra. 0:30 p. m.—Dance music.
WLIT—PHILADELPHIA—395

12:05 p. m.—Organ recital; orchestra.
2-3 p. m.—Concert orchestra; playist.
4:30 p. m.—Dance music.
5:50 p. m.—Scores; sports results.
7:30 p. m.—Dream Daddy.
8 p. m.—Talk on Sesqui-Centennial.
10 p. m.—Dance orchestra.
10:30 p. m.—Rufus and Rastus.
11 p. m.—Popular program. p. m.—Popular program. WFI—PHILADELPHIA—395 10:30 a.m.—Solos; Home Service talk.

1 p. m.—Tea Room Ensemble.

3 p. m.—Soprano solos.

3:45 p. m.—Eleanor Gunn Fashion Features. p. m.—Concert orchestra. WCAU—PHILADELPHIA—278 3 p. m.—Program from radio show. 8 p. m.—Program from radio show. 9 p. m.—Soprano and violin. 10 p. m.—Rennie Cormack, songs. 10:30 p. m.—Loeser's Dancing Orch

WPG-ATLANTIC CITY-300 WPG-ATLANTIC CITY.—300
2:30 p. m.—Baseball game, play by description direct from ball park.
6:45 p. m.—Organ recital.
7 p. m.—Morton Trio.
8 p. m.—Fire department.
9 p. m.—Concert orchestra. p. m.—Concert orchestra. 30 p. m.—Dance orchestra. WHAR—ATLANTIC CITY—275 n.—Seaside Trio. p. m.—Fashion review.

p. m.—Seaside Trio. :15 p. m.—Organ recital. WGY—SCHENECTADY—380 p. m.—Series game.

30 p. m.—Sunday School lesson.
p. m.—Albany Strand Theater Orchestra.

40 p. m.—Comedy, "The Rivals."

30 p. m.—Alice Fuller, pianist; Pluma
Weigel, reader; Charles A. Reilly, barytone. (Continued on page fifteen)

Dance Orchestras for This Week

Station WCAD, the radio station at St. Lawrence University, was successful in accomplishing a feat in radio that may not mean much to the average man but which does mean much to the radio experts who conducted the experiment and to the future of WCAD and of radio generally. In short, on October 26 station WCAD for forty minutes, from 8 p. m. to 8:40, received from 2XAH, the developmental station of the General Electric Company at Schenectady, the WGY musical program sent out from that station on 1,560 meters and rebroadcast it so clearly that messages were received from Canton, Ogdensburg and other points reporting the clearness of the program and the surprise of the recipients that the WGY program was coming

Preparations for the test have conago from the radio room in Carnegie Hall at St. Lawrence University was unsuccessful, due, as Professor Ward C. Priest, of the chair of physics at St. Lawrence, determined, to interference from power lines. For the recent test the instruments, a special set loaned for the occasion by the General Electric Company, were taken down into the fields of the open country behind the college and set up in a barn. It was felt by the experimenters that if happy location had anything to do with it the locawas a success. Received at the barn and transmitted to the station in Carnegie Hall, the treatment there was the same as when matter is transmitted from the gymnasium, athletic field, college chapel or other source on the college campus.

<sup>64</sup>La Gioconda" Over Radio By WEAF Grand Opera Co.

sented on the new schedule of Monday night broadcasting presentations by the WEAF Grand Opera Company will be "La Gioconda" to-morrow at 10 p. m., to be broadcast by WEAF, New York; WOO, Philadelphia; WTAG, Worcester, Mass.; WJAR, Providence; WCAE, Pittsburgh, and WCAP, Washington. "La Gioconda" has plenty of melody, generously embellished with interesting harmonies and colorful orchestrations. The "Dance of the Hours" is to-day one of the most





ceiver equals its beauty. Voldistance, range and tone quality

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TREMONT Radiophone Co. 541 E. TREMONT AVE. Phone Tremont 6037 Brist and largest Renadioston in Brong
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### Wave 29 Inches Long

A wavelength of but one five-hundredth the length of that used by the larger broadcasting stations, or equivalent to 74 centimeters (29 inches), has been produced by Winfred W. Salisbury, of Iowa City, working with the radio department of the University of Iowa. Comparing this with the wave length of a station operating on 484 meters, the wave would be approxi-

mately one-third of a mile long. Salisbury obtained these measurements by using laboratory methods. In regular outdoor experimental work he has produced a wave length of 1.3 meters, or a little over four feet, and with this has successfully broadcast over a short radius.

Radio Teaches Languages

### York Do Not Need

from whose headquarters at Aeolian Hall a statement containing objec- Columbia Evening Lectures tions to the plan has been issued.

The passing of the "distance" craze genuine entertainment are held by S. R. Wiley, president of the league, as

Listeners in New Mid-Western stations is proof enough Security League Luncheon and of their superiority." Seaman's Ceremony on Air

Wiley states further that a canvas made of the members of the Na- broadcast by station WJZ on Thurs-

New York and its replacement by bia University will broadcast evening New York; Edmund L. Baylies, Rear desire on the part of listeners for lectures by noted speakers on the pro- Admiral William S. Sims and Dr. John

"Two years ago the plan would have Chesterton and Stephen Leacock, who reputation of being the most active been very successful," says the organi- will lecture on America and England, organization in the city in the welzation's head. "At that time when respectively; Dr. Putman Cady, who fare of seamen, and holds as its suppeople went to buy a radio set the will talk on "Iceland and the Mid-porters some of the most prominent first question they asked was, 'How night Sun," and Dr. Montrose J. people in the country. The owner of a radio set in Eng- far can this set receive?' but now Moses, who will speak on "The Rosumed over a month of time. For land or France has to be an accom- what they ask is, 'How clear is it?' mantic Aspects of the American Theathat period H. K. Bergman, operator plished linguist in order to enjoy all A silent night then would have helped ter." Other features will be a program of WCAD, has been listening to the of the programs that he receives. The dealers sell sets on the basis of their of "Negro Folk Songs From the able, bus wire can be bent by driving long wave length from WGY station small European countries are so close DX capabilities, but a silent night South"; lecture recitals by Profestwo nails close together in the workto assure himself of the regularity together that the owner of a set in now would do more to hurt sales than sor Dorothy Scarborough; "The Creatof its wave length—that station any one of these countries can tune to increase them. Not only are the ive Spirit," by Professor Walter using 40½, 109, 380 and 1,560 meter in programs in five or six languages DX stations usually scratchy and Brown, of Carlton College, and "Dewave lengths and rebroadcasting during one evening. Radio should be noisy but the actual programs them- mocracy and the Main Street Mind." having been accomplished heretofore a valuable asset to the schools of selves are inferior to those of the by Norman Angell. The exact dates lent substitute for a ground. Its on the short but not from the long these countries in teaching foreign New York broadcasters. The fact that and further details will be announced action is that of an efficient counter-New York programs are relayed to from time to time.

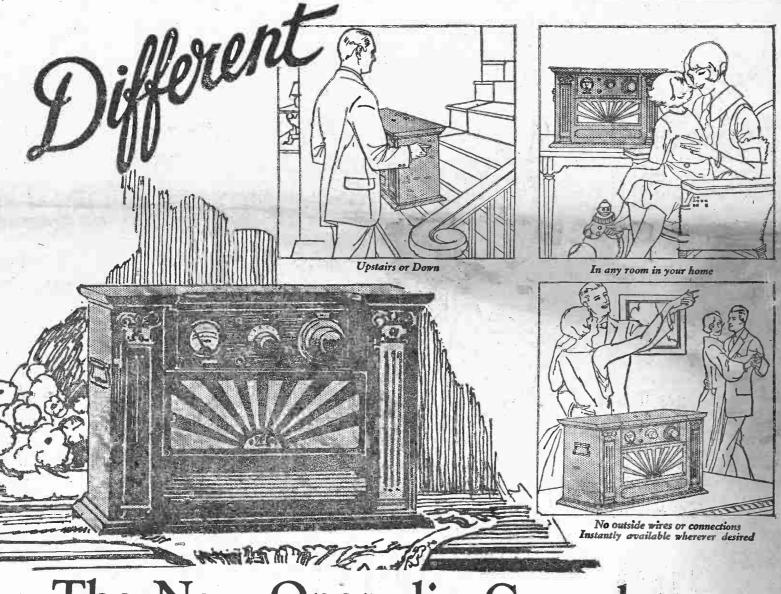
Seaman's Ceremony on Air

A Silent Evening made of the memoris of the majority of set owners will broadcast by station. The first, at 1:30, will be the speeches at the luncheon not be enthusiastic about the silent of the National Security League at The suggestion for a silent Friday night idea. Most of them seem to be the Bankers Club. The chief speaker night for the metropolitan broadcast- satisfied with the high grade pro- will be Frederick Hale, Senator ing stations is not meeting with the grams furnished by the local stations, from Maine and a member of approval of the National Radio Servapproval of the National Radio Servmany fine musical features taken off

the Committee on Naval Affairs. The other event is the laying of the corman's Church Institute at Front Street and Coenties Slip, when the To Be Broadcast by WEAF Right Rev. William T. Manning, WEAF in co-operation with Colum- Bishop of the Episcopal diocese of gram of the Institute of Arts and for the occasion will be furnished by being the main reasons why the silent Sciences direct from the lecture halls. The choir of Old Trinity Church. The Chief among them are Gilbert Seaman's Church Institute bears the

Substitute for Pliers

A Ground Substitute



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wish-and carry it to any part of the house. Its performance challenges that of the most intricate and expensive sets on the market today.

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THE NEW YORK HERALD NewYorkssamsationne RADIO MAGAZINE

SECTION TWELVE

SUNDAY, NOVEMBER 1, 1925

## Old King Kerry-A Radio Election Story

How the Big Political Boss of Mythington Went Down to Oblivion Through Broadcasting a Campaign Speech He Didn't Write

By CHARLES ROLAND



HE candidate for Mayor and his campaign manager were in conference. Election fell on Tuesday, only four days away, and the town of Mythington, in the State of Boom, was all agog over the battle. James Kerry, the machine / nominee, was plainly worried. Joe King, boss of the machine, was

"I don't like the whole thing," Kerry complained.

He shifted his cigar to the far corner of his mouth, settling his two-hundred-andtwenty-pound bulk in the sturdy armchair. "They ain't playin' the game fair,"

Jimmie continued. "This here campaign is different from anything we've ever had

Joe King could not deny this contention. As boss of Bailey Club he ruled the town with an autocratic hand. In eight years of leadership he had not lost a campaign, and yet this lawyer, Asbury Hadden, a novice in politics, was doing surprisingly well as fusion candidate for Mayor.

Instead of attacking the machine Hadden made fun of it. He drew sarcastic pictures of Joe King and ridiculed Jimmie Kerry. Hadden ignored the campaign

Kerry combination. He charged that they used the municipal radio station, OIC, for broadcasting their political propaganda. His charge, of course, was true, and it "What's this song I hear they're sing-

ing?" inquired King. "It's something Hadden wrote. Goes

Old King-Kerry, Old Kerry-King, Old King-Kerry is a Merry Old Thing." "I suppose he thinks that's funny,"

"I tell you, Joe, it takes a lot to get me worried, but I am worried, and that's the

truth," Kerry confided. The real campaign was to close the next day-Saturday. Kerry was scheduled to speak at eight-thirty over Station OIC. Asbury Hadden suddenly had announced a mass meeting in the high school auditorium, at which the better element of the

town was to be represented. "Most of them are radio fans," Kerry said, "but I'm afraid they're goin' down to the high school to hear Hadden instead of staying at home to listen in on me."

His campaign manager knitted his brow, tapped his desk with alternate finissues of taxes and good roads, devoting | gers and remained silent a moment. His his whole time to laughing at the King- | fertile brain was at work and could be

and smiled. He knew from experience that when Joe "got it" everything would be all right.

They Hire a Jazz Band

"We'll hire the Nicholas Jazz Band from New York to come down here," said Joe. "Suppose they do charge \$500 for the night. We'll have them broadcast three numbers before you talk and two more when you're through. Then folks will have to stay home. Every radio in town will tune in."

Jimmie chuckled. That old King-Kerry combination was invincible after all. Joe telephoned the editor of "The Morning Myth" asking him to announce to-morrow night's radio program in extra black headlines. He suggested, too, that his favorite newspaper might properly fore-

cast Kerry's victory by 10,000 votes. The editor of "The Myth" heartily approved the idea of the Nicholas Jazz Band. He warned Joe King of a new development, however. The opposition newspaper, "The Daily Dawn," was coming out with a charge, on the authority of Asbury Hadden, to the effect that Kerry's speeches, so eloquently broadcast by radio, had all been written by King. The article would say, in effect, though in polite phrases, that Jimmie Kerry was a fat and good-natured nincompoop who was barely able to read the speeches prepared by speech."

King, let alone write his own. Joe hung up the receiver, putgled anew. 'Say, Joe, I can't read your writin' What's that word?"

He repeated the editor's report to Jimmie

who grew deeply pained. "He's the absolute limit," said Jimmie, referring to the fusion candidate. "How can he say such a thing? He's never seen you write the speeches. He's never seen me dictate it over again to my stenographer. All he's ever seen is the typewritten sheets that I give to the papers. Say, how does he get that way?"

A faint smile was quickly checked by Joe King. There was little use explaining Jimmie Kerry now anybody could know the extent of his mental powers. One glance at Jimmie proved the truth of the theory of compensation. His avoirdupois clearly made up for his cerebral lightness. Nevertheless, a halo should hang over the head of a candidate for the mayoralty, and Hadden's new charge struck home.

"I've got to write this speech that you'll deliver over the radio to-morrow night," said Joe, "and write it in such a way that no one can say it isn't yours."

"Exactly," agreed Jimmie.

"But I can't let down the tone too suddenly," continued Joe. "After all, some of the speeches were pretty high flown, come

"That one I delivered at the dedication of the swimming pool," Jimmie reminded

"What was it you said?"

"Something like this," Jimmie recalled: 'These mermaids, disporting themselves gracefully and healthily, proclaim to aythington the proposition that its good government lies reflected in the sparkling waters of our municipal natatorium."

King reflected again, tapping the alternate fingers on his desk.

"Do me a favor and go home," Joe said frankly. "I've got to think out a good

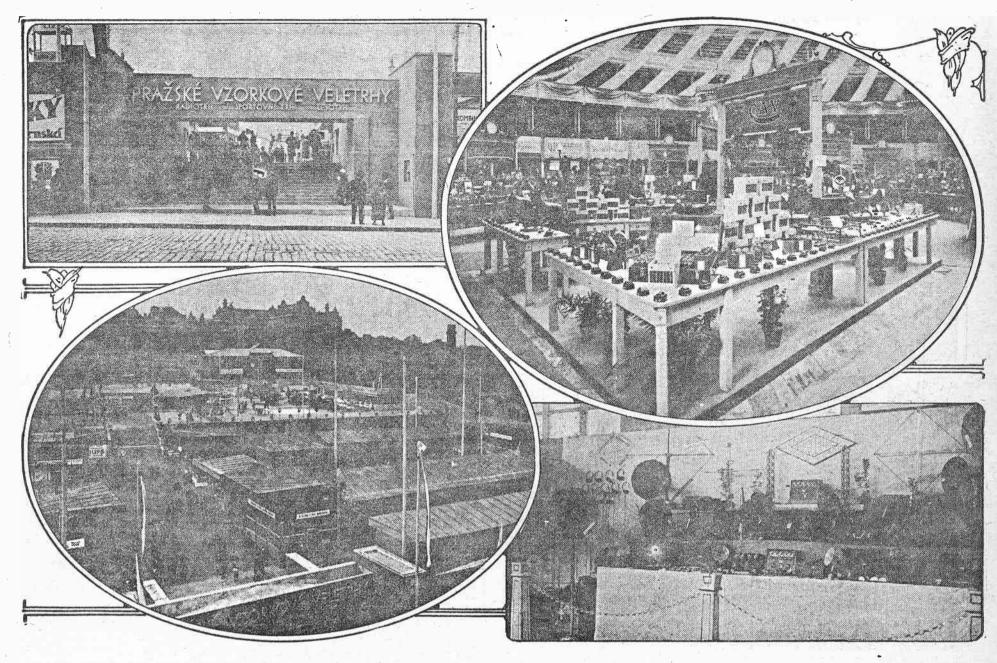
(Continued on page four)

### Foreign Radio Fans Show Great Interest In European Wireless Expositions

Leading Firms, Large Department Stores and Press Participate in Shows

By A. DINSDALE

Member Radio Society of Great Britain



Above (left)-The main entrance of the Prague Radio Fair, which was held from September 6 to 13, 1925. Below-General view of the grounds occupied by the Prague Fair. Above (right)—General view of some of the booths at the exhibition held in Albert Hall, London, September 12-23, 1925, by the British National Asociation of Radio Manufacturers and Traders. Below-A view of one of the booths occupied by a Czechoslovakian firm at the Prague Radio Fair

OINCIDENT with the September radio expositions held in New York City, exhibitions were held in those European countries which are taking an active interest in radio broadcasting and have made the greatest progress in the de velopment of national broadcasting sys

Foremost amongst these displays comes the National Association of Radio Manufacturers and Traders' Exhibition, held in the Albert Hall, London, from September 12 to 23. This association, known briefly an organization whose members are all engaged in the radio industry in Great Britain. It is thus in the best possible position to stage an exhibition of radio apparatus which shall be completely representative of the industry as it is in England to-day.

#### Features of the British Show

Some idea of the layout of the exhibition can be obtained from the accompanying illustration, the stall in the foreground famous before the days of broadcasting for their automobile storage batteries, lighting and starting equipment. Besides producing a varied line of storage batteries specially designed for all radio purposes, they also have developed many other excellent radio components.

All the leading British firms participated in the show, including several large London department stores which run a radio department and all sections of the technical press. Amongst the special exhibits was a ship's wireless cabin, completely equipped with marine radio-telegraphic apparatus for maintaining constant communication with the shore and with passing ships.

A hospital ward with nurses in attendis called the "auto-broadcast" system, by | foil, were attached to the top.

which music or speech may be turned on | in a hospital ward as easily as a water tap. The system has been specially arranged for hospital use in such a way that, while the matron can disconnect all keadphones or loud speakers in the wards by a single switch, the loud speakers in achieved success by attaching his aerial the staff quarters will continue to func-

Particular interest attaches to such equipment in England on account of a campaign which has been conducted for hospitals with radio apparatus so that patients may be provided with entertain-

#### Marconi's Original Apparatus

Great interest was also taken by the public in the historical exhibits, which included much of the apparatus used by Senatore Marconi in his first experiments with wireless. A model of his first transmitter and receiver, which he used in his being that of a well known English firm, father's garden at Bologna in 1895, was shown, and it contained many of the original pieces of apparatus. The instruments include an early type of transmitting key, a Newton ten-inch spark coil, and a small horizontal oscillator. Other exhibits included a multiple spark discharger, 1897-'98; the Fleming cymometer, or earliest type of wave-meter; one of the two first musical spark transmitting discs, 1907, and a collection of apparatus used by Marconi at the G. P. O., London, and on Salisbury Plain in 1896 and 1897 for | The patent situation over there is such his first experiments, demonstrations and

In these demonstrations a plate was used at the top of the aerial for shortdistance work, and for long-distance communication skin balloons, ten feet in diance emphasized the improvement in what | ameter, or large kites, covered with tin

lectures in England.

Atlantic experiments in December, 1901, admittedly difficult. Much assistance is he first erected masts at Newfoundland to support his receiving aerial. These were blown down, so he tried balloons, which were blown away, and ultimately he to a kite. This original kite, together with the coherers and relays used in that historic experiment, were on display at

Another notable exhibit was the experisome time by one of the leading London | mental apparatus for tuning, 1899. This | i. e., detector, R. F. or A. F. amplification scription for the purpose of equipping all | ing the first experiments on tuned transmitters, and it was upon this that the famous "four sevens" patent, 7777-1900, was based.

### Wonderful Variety of Tubes

By way of contrast to these oldtime coherers, relays and magnetic detectors there was a marvelous display of thermionic tubes of all kinds, showing their development and certain manufacturing and testing processes. An excellent idea of the progress made in tube design and manufacture was obtainable from this exhibit. Transmitting tubes, from the smallest ones consuming but a few watts of nower to the enormous water-cooled giants, capable of handling thousands of watts of power and enabling communication to be maintained at all times with all parts of the world, were on show.

In the matter of receiving tube development England has progressed perhaps further than any other country in the world. that a vast amount of competition in details of design and manufacture is possible, with the result that eleven manufacturers produce a total of no less than ninety-three different types.

One manufacturer alone makes twentytwo types. The choice of a tube for any particular purpose would therefore appear

When Marconi made his first trans- | to be an almost impossible task, and it is rendered by the makers themselves, however, for almost all of them supply with their products not only the characteristic voltages and currents, but also such particulars as the best grid bias voltage to use, the total milliamps emission of the filament, the voltage amplification factor, the approximate impedance in ohms, and the purpose for which the tube is designed, or power bulb for the last A. F. stage.

### The King's Microphone

The Marconiphone Company exhibited the microphone used by King George on the occasion of the opening of the British Empire Exhibition at Wembley and on other occasions since. This microphone is decorated in silver and is specially engraved each time the King uses it. It is reserved exclusively for his use when broadcasting.

Among other features on this stand were super loud speakers by means of which the exhibition hall was flooded each evening with "mystery music" from Paris and other Continental broadcasting sta-

Many other interesting exhibits attracted considerable attention, among which was a demonstration of the manufacture of hard rubber, or ebonite, as it is called in England, and an apparatus for the automatic synchronization of clocks by wireless. Tubes, etc., are automatically switched on just before the time of the time signal from the Eiffel Tower, Paris, the clock automatically synchronized by the signal and everything switched off again in the same manner. Not only can a master clock be synchronized by this apparatus but it is also suitable for synchronizing clocks throughout the coun-

(Continued on page six)

A Table of Vacuum Tube Characteristics

| Filament Circuit |                     | cuit | · P                          | ate Voltage For Detection 90 Volta EB |                  |                          | Milliam                 | Milliamperes with<br>Grid Circuit Oper     |                                                |                              |                                                 |                      |                                   |
|------------------|---------------------|------|------------------------------|---------------------------------------|------------------|--------------------------|-------------------------|--------------------------------------------|------------------------------------------------|------------------------------|-------------------------------------------------|----------------------|-----------------------------------|
| DeForest Au      | "A" Battery Voltage |      | Filament<br>Current<br>Amps  | R. F.<br>Ampli-<br>fier               | Detector         | A.F.<br>Ampli-<br>fier   | Grid<br>Leak<br>Megohma | Grid<br>Con-<br>denser<br>Micro-<br>farads | Mex.and<br>Min. Plate<br>Impedance<br>in Ohms. |                              | Mutual<br>Con-<br>ductance<br>in Micro<br>Mhos. |                      | Plate<br>Current                  |
| DV5              | 6                   | 8    | .26<br>max.<br>.24<br>Min.   | 6734.<br>to<br>135 *                  | 12<br>to<br>2234 | 90<br>to<br>180**        | 5 to                    | .00025                                     | 17,003<br>Max.<br>9,003<br>Min.                | 10.1<br>Max.<br>8.9<br>Min.  | 1.120<br>Max.<br>525<br>Min.                    | 90                   | 5.0<br>Max.<br>3.5<br>Min.        |
| DV2              | 6                   | 5    | .26<br>Max.<br>.24<br>Min.   | 67 1/2<br>to<br>90                    | 16<br>to<br>45   | 67½<br>to<br>90          | 2 to                    | .00025                                     | 11,000<br>Max.<br>8,000<br>Min.                | 8.8<br>Max.<br>6.0<br>Min.   | 1,100<br>Max.<br>550<br>Min.                    | 90                   | 9 m.a.<br>Max<br>5,1 m.a.<br>Min. |
| DV3              | 435                 | 3    | .085<br>Max.<br>.060<br>Min. | 45<br>to<br>90                        | 16<br>to<br>2234 | 673 <u>4</u><br>to<br>90 | 2 to<br>5               | .00025                                     | 18,000<br>Max.<br>6,000<br>Min.                | 10.0<br>Max,<br>6.00<br>Min, | 1,000<br>Max.<br>400<br>Min                     | 90                   | 7.0<br>Max.<br>3.0<br>Min.        |
| DV3-A            | 436                 | 3    | .085<br>Max.<br>.060<br>Min. | 45<br>to<br>90                        | 16<br>to<br>22½  | 67½<br>to<br>90          | 2 to 5                  | 00025                                      | 18,000<br>Max<br>6,000<br>Min.                 | 10 0<br>Max.<br>6.00<br>Min. | 1,000<br>Max.<br>400<br>Min                     | 90                   | 7 0<br>Max<br>3.00<br>Min.        |
| 1                |                     | DV5* |                              |                                       |                  | DV                       | 200                     |                                            |                                                | D                            | V3 and D                                        | V3-A                 | ,                                 |
| Plate V          | /ol+age             |      | e Grid Bis                   |                                       | late Volta       | W .                      | Negative C<br>"C" Batte |                                            | Plate                                          | Voltage                      |                                                 | tive Grid<br>Battery |                                   |
| 112              | 1/2                 |      | 11/2                         |                                       | 90               |                          | - 11/2                  | á                                          | 90                                             |                              | 11/2                                            | on 1st Al            | F                                 |

The above table, which gives the operating characteristics of De Forest receiving tubes, should prove to be of value to radio experimenters

By Dr. Fulton Cutting about right. It can be done, but so the electro-magnetic waves. badly that it is hardly worth talking about. Metal and salt water block WGY To Conduct Tests With as accurately as possible. radio waves very effectively. How- Horizontal and Vertical Waves The Goodrich Company, who for the ever, they don't do it 100 per cent.

sitive receiver we can receive signals in places where the task would seem hopeles.

Steel buildings are generally poor places for receiving. The radio waves rebound from the steel framework and very little penetrates into the interior of the structure. The rebounding of the waves is a physical phenomenon identical with the reflection of light from a mirror. It must be remembered that radio waves and light waves are one and the same thing. They are both what physicists call electro-magnetic waves, only light waves are about a billion times shorter than radio waves of the length used in broadcasting.

Much has been written, both mathematically and otherwise, on metallic reflection of light waves. The theory applies to radio waves. Simply stated, it is this: When an electromagnetic wave strikes a metallic surface it induces electric currents in face it induces electric currents in the results of the experiment from a maronautical standpoint as well as from a radio standpoint.

The experiment is to be conducted with standpoint as well as from a radio standpoint.

The experiment is to be conducted with specially prepared sounding ballons inflated with hydrogen to give the material with specially prepared sounding ballons inflated with hydrogen to give the material standpoint as well as from a radio standpoint.

The experiment is to be conducted with specially prepared sounding ballons inflated with hydrogen to give the material with specially prepared sounding ballons inflated with hydrogen to give the material standpoint.

The experiment is to be conducted with specially prepared sounding ballons inflated with hydrogen to give the material standpoint.

The experiment is to be conducted with specially prepared sounding ballons inflated with hydrogen to give the material standpoint.

The experiment is to be conducted with specially prepared sounding ballons with specially prepared sounding ballo

face it induces electric currents in Company, has recorded considerable the surface and these currents are preliminary research in the field of such as to start a new electro-mag- horizontal radiation, but his work, netic wave in the opposite direction. for the most part, has been confined to If the metal is a good conductor there observations on short wave transmisis very little loss caused by this sion. The tests of November 2 and action and the reflected wave is prac- 3, will be on 379.5 meters, thus entically as strong as the original wave. abling all receiver owners within The electrical conductivity of ob- hearing distance of WGY, to make stacles in the path of a radio wave is comparisons. the criterion of whether or not the These tests are conducted for the obstacle will reflect the wave.

Wooden or brick houses are bad sion, and they are part of the comelectrical conductors and radio waves prehensive program of transmitter cannot set up currents in them. They development which is being carried do not reflect, and therefore the out at the 54-acre laboratory near waves pass right through them. Schenectady. In steel buildings, however, cur-

rents are set up in the girders and Mary Lewis and P. Kochanski reflection occurs. In between girders In Joint Concert at WEAF the waves penetrate somewhat. They Mary Lewis, operatic soprano, bulge into the building in the process whose career has been a meteoric rise of being reflected. This phenomenon from the "Follies" to the grand opera may be easily investigated by means stage, and Paul Kochanski, master of a portable loop set. Near the win | Polish violinist, will entertain the dow of a building of heavy steel con radio audience of WEAF, WEEI, struction signals will be strong, but WOO, WGR, WCAP, WJAR, WCAE, if he set is carried into the interior WSAI, WWJ, WOC, WCCO, WTAG the signals will get weaker and and KSD at 9:15 p. m., New York weaker until they practically disap- time to-day, in a joint concert of one

This shielding effect of steel build. will sing and play in the studio of ings is very harmful to loop receivers WEAF, New York, for an audience and indoor antennas. Apartment scattered throughout the Eastern and house installations are difficult for mid-Western parts of the United this reason. When outside antennas can be used the trouble is overcome. When outside antennas are not feasible, however, it is important to get chanski two groups. The concert at least a little exposure to the radio waves on the outside of the building. A wire hung out of the window is better than a wire .run around, the moulding of the room. Still better is a wire hung out on the end of a fish ing pole. This puts the wire further ductor of electricity.

States.

Lochanski.

Mary Lewis has three groups o

songs in the program and Paul Ko-

closes with the beautiful "Ave Maria"

and Mr. Gregory Ashman for Mr

Silver is considered the best con-

### Large Conductors Cause Reflection away from the building and exposes it ostronger waves. The fishing pole even by itself is a good antenna. In this case the pole must be made of Radio Waves steel and a wire run from the base Radio Experiments more than one would willingly glass tumbler fall on the floor. A phenomenon in connection with

the reflection of waves from steel We read in the newspapers of buildings is the rapidity with which effect of air currents upon radio people receiving radio programs ir he waves fill in behind the building proadcast reception is soon to be safe deposit vaults, in subway tubes after they have passed over it. There launched by the B. F. Goodrich Rubunder rivers, or under the sea in s very little shadow behind the build- ber Company in collaboration with submarines. There is no question ng. This filling in will always occur the Henry Field Seed Company, about this; but if some one were to unless the reflecting body is several Shenandoah, Iowa. In the experisay it is impossible he would be just limes larger than the wave length of ments station KFNF will be used. in order that results may be checked

Radio listeners are again asked to past year, have offered entertainment become laboratory assistants of the to radio listeners with their Silver from a local station and a very sen- radio engineers of the General Elec- town Cord Orchestra, are interested sitive receiver we can receive signals tric Company. This time the engi- in the results of the experiment from in places where the task would seem neers seek light on the subject of an aeronautical standpoint as well ar

purpose of improving radio transmis-Speaker type H

> Acoustics by Brandes means better radio. The new Speakers are truly remarkable—the result of seventeen years of intensive research in the Brandes laboratories.

rendered as a duet. Ellmer Coller will be at the piano for Miss Lewis Experts in radio acoustics

and listeners-in asked to co-operate

# high hour's duration. These two artists

since 1908

at the time of the release and folviously determined gas pressures.

advanced with respect to radio trans-mission and the higher air currents orchestra, comes from an extremely is not known, but the facts to be musical family. gleaned from such an experiment will at least provide something of tangible scientific value to aeronautics, ble scientific value to aeronautics, engineers point out. This method of using radio and large meteorological balloons together offers a new tie-up between two mediums of wide interest to the scientific world at the present time.

many of them, under some of the most famous teachers in this country, and are devoting their lives to their career. The different instruments which they play in their orchestra include the violin, 'cello, flute, clarinet, oboe, bass viol, viola

The inflated balloons will carry and piano.

This orchestra has been organized ment by reporting the finding of a its renditions. balloon and returning its official tag.

Handle Phones Carefully

nouncements will be made over radio | Symphony Orchestra of Boy Music Students Makes Debut lowing this for several days. The Twelve boys, whose average age is balloons will carry tags bearing a about seventeen, make up the Connumber corresponding to the record sonant Little Symphony Orchestra number of the balloon. These tags, which will broadcast at WGBS at 9 when filled out and mailed back to p. m. Tuesday. These youths are all station KFNF by those who find the pupils in the different high schools of balloons, will complete the records greater New York. The orchestra for the experiment and enable en- leader himself is seventeen, too; he gineers to study directional currents is Salvatore Gioe, a young Italian, a in the different air stratas to which nephew of a man at the head of an the balloons were raised by pre- Itriian conservatory in this city, and whose orchestra of twenty-six pieces What interesting theories may be he has conducted himself on oc-

from 1,000 to 1,500 miles, and the by Floyd Neale, of the staff of Sta-Henry Field Seed Company has antion WGBS, and its air appearance nounced its intention to give prizes will be the first time the public will to all who co-operate in the experi-

Loose Nuts Cause Noises Loose nuts on tube sockets often Headphones, when well made, are cause set noises. Lock washers are delicate instruments and should be recommended wherever nuts are used

more than one would willingly let a crystal set can receive under normal

### Radio Exchange

Rate, 40 cents a line. Ads. accepted until 12 o'clock

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#### Parts and Equipment

FOR \$5 you can build a GOOD "B" Eliminator for A. C. Complete instructions, \$1. Ferrand, 990 E. 26th st., Paterson, N. J.

ELECTRODYNE CO., 2378 3d Ave., specializing Mica: By-Pass Condensers. Harlem 2048.

SOMETHING ENTIRELY NOVEL

business, good Phone Nevins 1753,

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NO CHARGE FOR CONSULTATION.
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ERLA SERVICE STATION Authorized by Electrical Research Lab,
A limited number of factory built
Erla sets at special prices.
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BUILD YOUR OWN "B" Battery. Nicket and from elements and all supplies Roberts, 1122 Myrtle av., Brooklyn. PHONES, LOUD SPEAKERS RE-PAIRED, remagnetized; sets repaired; weak tubes that light revived, 50c. Roy a, 100 West 46th st. Bryant 0985. BUILD rechargeable B Battery, 100 volt unit, \$5.75; assembled, \$11.75 Royal Storage Battery Co., 124 W. 34th

INSPECTION, installations, repairs, in radio since 1908; reasonable rates. Mardon. Dayton 1531, 1309 West Farms Rd.

WHEN HAVING TROUBLE with your radio set call Whitehall 8246. Radio Engineering Service, 16 Hudson st.

Receiving set with only two parts; no tubes, no batteries; costs but \$1, and it works. Mailed upon receipt of price. See it demonstrated. Agents wanted.
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RADIO SETS, Parts and Jewelry bought and sold. King, 821 6th av. Bryant 2198. Radio Financing

RADIO FINANCING. apital.

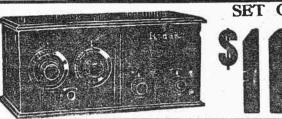
We are prepared to finance any radio 5 TO 40% off on Brunswick Radiolas. per-Heterodyne, Victrola, Records inberg, 3891 3d av. (172d). Bingham proposition of merit.
Thirty years' experience enables us to give prompt service. Reasonable rates.
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The Famous Nationally Advertised Licensed Regenerative Armstrong Patent

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RESULTS—ANYTHING WITHIN 1,500 MILES

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Voltmeter

MAIL ORDERS PROMPTLY FILLED IN ORDER OF RECEIPT SEND ORDERS TO 577 MYRTLE AVE., BROOKLYN, N.Y.





### News and Notes of the Radio Trade

New Hydrometer

The Robert Bosch Magneto Comtion to the "non-drip" feature, which prevents acid from dripping on furniture, clothes, etc., accurate readings are insured because the float is con-This feature makes the device ideal special composition. for testing storage B batteries.

#### Joins R. E. Thompson

Western Electric Company, has joined the R. E. Thompson Manufacturing Company and will take charge of the laboratory force as chief assistant to Dr. L. F. Fuller. chief assistant to Dr. L. F. Fuller, ure of hearing them. vice-president and chief engineer.

Vail, in New Jersey. He completed his work there just before joining Company.

#### Battery Chart

e used with every make and model gram. of receiver as recommended by the chart may be obtained direct from the United Light and Heat Company.

#### French Loudspeaker

is the lever for altering the imped- over a piano recital by Ernest

Book of Radio Sets "Radio Sets that Jack and Dad Built-and How They Built Them," by M. B. Sleeper, editor of "Radio The booklet describes and illus- City.

trates five standard "hook-ups." It tells how Jack inoculates his sceptical Dad with the "radio bug" by making a crystal set. Dad's interest aroused, he and Jack build first an Ambassador set, next an RX-1, then a Browning-Drake "five," and with their final 8-tube "Cotton" Superheterodyne, win the prize in a radio

set building contest. Besides assembly instructions for pany, Inc., of New York City, have each set, the booklet contains many recently put their new "non-drip" helpful suggestions regarding anhydrometer on the market. In addi- tennæ, grounds, dry cells, storage batteries and current tap devices.

#### Londspeaker Console

The Windsor Loudspeaker Console, structed so that it cannot stick. The manufactured by the Windsor Furnihydrometer has a small diameter ture Company, of Chicago, is a very barrel which permits a reading to be good-looking console featuring a btained with a small amount of acid. loudspeaker unit and horn made of

Al Walker, Oldtime Minstrel. Writes Old Songs for 'Twins' Walter A. Heppner, formerly of the the program of the "Gold Dust Twins"

"I'm as Happy as a Big Sunflower," Mr. Heppner, who is well known made popular by Billy Emerson and s. a radio engineer, has had wide- Bobby Newcomb and the team of Delpread experience in laboratory and chanty and Hengler, was requested by field work with the Western Electric an old-time minstrel, Al Walker, who Company. At the request of the War has been retired from the boards for Department, in Washington, he was thirty years. Although he is nearly granted leave of absence from the blind, he took the trouble to write blind, he took the trouble to write out the words and music for the portant work with the United States
Army Signal Corps, at Camp Alfred

Cessors of the eld-time minstrels with cessors of the old-time minstrels with Follow the whom he worked so many years.

"Shoo Fly," an old-time song and the R. E. Thompson Manufacturing dance that achieved great popularity the Leaders and had a very long run with Bryant's Minstrels in 1869-'70, is the The United States Light and Heat other number to be heard from Corporation, of Niagara Falls, N. Y., WEAF, WEEI, WFI, WCAE, WGR, have made up a chart which gives the WWJ, WOC, WJAR, WCCO and KSD correct type and size of battery to during "Goldy" and "Dusty's" pro-

set manufacturer. Copies of this Ernest Hutcheson and String Quartet in Steinway Concert The second of the Steinway series

of classical music programs to be broadcast by stations WJZ, WGY and The Brunet "Duo-tone" Loudspeak- WBZ at 8:30 to-morrow evening er, made in France, has recently will present a strong array of been placed on the American market. he world's finest talent. The openspecial feature of this instrument ing half of the concert will be given Hutcheson, the famous English In one position of the lever the pianist. Mr. Hutcheson has prepared coils are in series, giving a total a most elaborate program for this resistance of 4,000 ohms; in the other occasion. The latter half of the position the coils are switched into period will be devoted to Schumann's parallel, giving a resistance of 1,000 Quintet, played by the New York ohms, with a consequent altering of String Quartet, with Mme. Fannie Bloomfield-Zeisler at the piano. This The usual lever for tone regula- will be an attractive feature, for the ion is also incorporated in this in- New York String Quartet, composed strument so that with the facility of of Ottokar Cadek, first violinist; altering the impedance plus the ad- Jaroslov Siskovsky, second violinist; ustment for volume, the instrument Ludvik Schwab, viola, and Bedrich s readily adjustable to give the best Vaska, cello, is one of the leading eproduction for any given item being units of its type in the world, and Mme. Fannie Bloomfield-Zeisler bears the distinction of being the oldest living concert pianist.

Mexico Made Use of Radio Mexico is probably the only coun-Engineering," is the title of a 48-page try which has made use of radio booklet published by the Hard Rub- broadcasting in war. During the reber Manufacturing Division of the cent revolution bulletins from the Rubber Association of America, Inc. front were put on the air at Mexico



George H. Kolbs (left), chief radio officer of the steamship President Harding, greeting Gino d'Ambrogio, chief radio officer of the steamship Ignazio Florio, shortly after the heroic rescue at sea when the steamship President Harding saved twenty-seven men of the crew of the other,





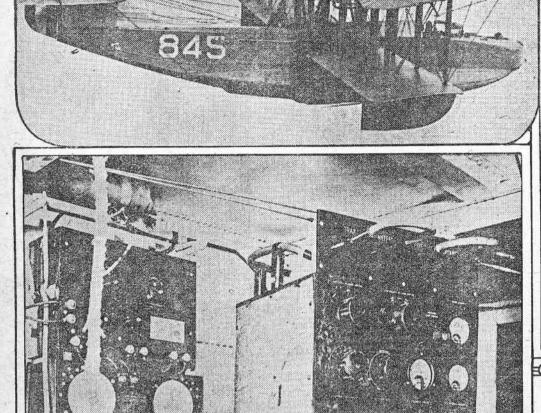


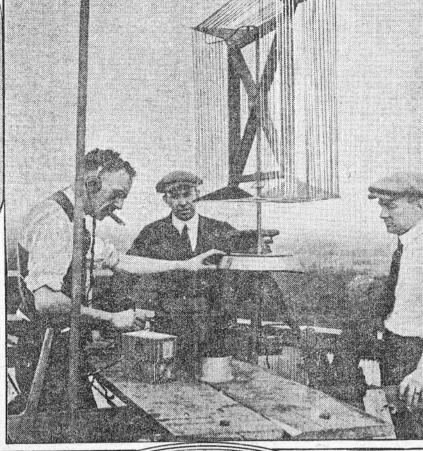
Use the Radio Exchange Column if you want to Buy, Sell or Exchange anything in Radio

### By Use of Navy Radio It Is Possible to Send Half-Way Around the World

Some of the Naval Wireless Developments Which Have Been Made in the Last Few Years

By LIEUTENANT COMMANDER T. A. M. CRAVEN Radio Section, U. S. N.





Above—Receiving tests conducted at Lakehurst, N. J., with a radio compass

the method employed it. sastalling an antenna on top of the flying boat F-51 is shown above. Below-The radio installation on a PN-9 seaplane

HROUGH its chain of forty high- | various parts of the Atlantic Ocean and at home and abroad. This radio station investment cost the government approxiconstant official use and, in emergencies, is regarded as worth far more.

Governmental dispatches, most of them secret naval orders and, in many instances, important messages pertaining to aid, relief and the safety of life are flashed instantly to whatever point it is necessary. Sometimes the naval radio service distributes news items of impor-

### **Practical Demonstration**

One of the first examples of what the radio facilities of the navy could do was demonstrated prior to the trans-Atlantic flight of the NC planes in 1919. Just previous to the main flight, when the three planes were flying up the coast from Nantucket to Newfoundland, several newspaper correspondents were gathered in the radio room in the navy building waiting for news of the first lap of the long trip. Nothing had come in from Commander A. C. Reed, time was hanging heavy and the conversation swung to more speedy subjects. One of the big press association reporters mentioned that his association could flash news to every part of the country within five minutes by wire. In the spirit of jest a naval officer replied that the naval radio service could flash news to half the world in that time via radio. One of the correspondents upon hearing this statement left the room, seemingly with some obscure but malign intent. So the officer immediately established communication with Commander Reed and various stations of the network, as well as with a few men of war in a representative to witness this experi- represents the active start of the present

powered and ninety-five inter- the Gulf of Mexico. The correspondent nediate shore radio stations the soon returned with a message from the navy is always in direct touch with the | Assistant Secretary of the Navy to Comwhole world, and, of course, its warcraft | mander Reed, asking him how he was and sending best wishes.

This message was immediately dismately \$22,000,000, but in view of its patched to Reed, and at the same time commercial and humanitarian service, it radio system. Reed replied in about two minutes as follows:

"Thanks for your good wishes. NC-4 is 20 miles s. w. of Sable Island, making 85 miles per hour."

This reply was also dispatched by radio to the stations of the network. Acknowledgments were quickly received from Paris, London, Rome, Norway, Panama Canal, San Francisco and vessels on the Atlantic. The message was also intercepted by a United States naval vessel in Turkish waters. A few seconds later the message had been received in Honolulu, Guam and the Philippines. The entire operation, from the time the Assistant Secretary's message started on its way until the delivery of Reed's reply to the various parts of the world, took only four minutes and twenty-eight seconds.

Distance meant nothing. In that little room could be pictured within a few seconds the planes in the air, vessels on the sea and under the sea, the snows of the North and the palms of the South Sea Islands. A contrast made possible by the most modern of inventions, but justifying the rather rash boast of flashing news to half the world in five minutes.

The navy was on the job in radio early, watching every move. In 1902 "The New York Herald" arranged with Mr. Marconi for the installation of radio apparatus on certain private vessels, so that newspaper reporters could telegraph to their papers the results of the international boat races off Sandy Hook. The navy sent | ship. This date is mentioned because it

station. Below-Radio antenna on the N-9 seaplane tive immediately saw the military value radio science; and it is interesting to note of radio communications and recomthat this 100 kilowatt set, the first of its mended that the navy investigate this kind in the world, is now a historical

matter as rapidly as possible. This was

done, and many United States naval ves-

sels were soon fitted out with the new

invention. The apparatus was crude and

was useful for communications at short

In 1907 or 1908 the navy conducted

what was then considered long-distance

radio communication tests with the U.S.S.

Salem and Birmingham. These ships put

out to sea with high-power radio spark

sets and endeavored to communicate back

to the United States each day as they

cruised across the ocean. The maximum

distance obtained was about 1,000 miles

at night. The sets themselves were im-

practicable for naval use, but the ex-

periments resulted in the establishment of

one of the most important technical

formulas of radio engineering, the so-

called "Austin-Cohen Formula." These

gentlemen at that time were employed by

Later, in 1913, the U.S. S. Delaware, equipped with a spark transmitter and a

receiver having a crystal detector, estab-

lished communication while off the Azores

with the newly constructed 100 k. w. spark

station at Arlington. There was great

difficulty in receiving messages on board

the navy as physicists.

#### object in a museum. Telephone Tests

Shortly after this date the navy in conjunction with some of the leading American manufacturers conducted a series of trans-Atlantic radio telephone experiments. The apparatus was impracticable for every-day use, but it served as an excellent demonstration of the possibility of radio and resulted in further endeavor and experiments on the part of the navy. This is believed to be the first time that the voice of the United States was heard in Europe by means of radio telephone.

Beginning in 1914 the development of radio in the navy was so rapid that it is difficult to select any single outstanding item of interest. However, at the entrance of the United States in the World War the navy had several high-powered interoceanic stations, several long-range coastal radio stations, and almost every vessel in the navy was equipped with radio. But this was still insufficient to meet the requirements of modern naval warfare, even though the navy's radio equipment at the beginning of the war was far in advance of commercial apparatus them

(Continued on page six)

### Elementary Information for Radio Novice

### Answering the Question, "What Is Radio?"

By JAMES W. H. WEIR

Technical Editor, "The National Stockman and Farmer"

This is the second of a series of lecsures for the radio layman which is being broadcast through KDKA, the Westinghouse Electric and Manufacturing Company's station at East Pittsburgh, Pa.

HE old-fashioned idea of radio, together with the layman's imaginary belief, that of ragged blue sparks jumping from an aerial, may be likened to the old Irish woman's idea of the submarine. Her son was in the navy. "Poor Tim," she often sighed, "to be cooped way down in one of them boxes with nothing to breathe through but the periscope."

Radio is neither black art nor magic. It is not mysterious, and in this world of ours there are many things more difficult to understand and far less interesting to

Let us begin with the word "radio" itself. Radio comes from "radiate," a word meaning to spread out in all directions. To know radio it is necessary to be at least somewhat familiar with electricity. It is not my purpose to explain the meaning of electricity, and my introduction of this science into the story at this time is merely to impress on your mind that radio is a form of electricity in motion and that it spreads out from its source of creation in all directions.

Most of us are familiar with ordinary domestic electricity—the kind employed in lighting our homes and running machinery. We know it is something that is carried from place to place along wires which provide a pathway for it. In radio is more important that my readers devote the electricity used is somewhat different. | their time to the study of radio as it is It does not travel along wires, but rather radiates out in all directions in the form of waves. It is this very fact that makes it possible for us to sense the effects of radio in an unlimited number of places simultaneously.

Science has introduced to the world

Without further ado Jimmie departed

wave motion very similar to radio in their | spoken voice is directed into a small black | amplification will enable him to receive characteristics. They are known to us as light and sound. Sound, for instance, is a form of wave motion that spreads out in all directions from its point of origin. Like radio, its effects can be sensed by a number of people in different places simultaneously. In the case of sound, however, the distance over which the effect is sensed is limited to those within hearing distance. Again take light. It also possesses similar characteristics to those mentioned above, and in addition science has proved that the speed of the light wave is identical with that of the radio wave. In other words, both light and radio waves travel at the terrific speed of 186,000 miles in a second. In the case of light our eyes are the receivers with which we interpret the effects of the wave action. In radio we employ very delicate instruments known as re-

In radio, the electrical waves responsible for the results we know to be established facts are created by means of special apparatus in the transmitting sta-When the layman has firmly fixed the foregoing facts in his mind he is well on the road to a thorough understanding of the radio science.

#### Two Forms of Radio

Radio communication is known in two forms, first the dot and dash system, and secondly, the popular broadcast. In this series of articles little will be said relative to the telegraphic side of radio, as it used in the broadcasting of speech and

For the most part we all are familiar with that domestic utility known as the telephone. How many of us, though, could describe briefly the method of its operaduring years gone by two other forms of a brief outline of what takes place. The man erroneously believes that additional What next?

box termed a transmitter. Inside of this box there is concealed a thin metallic plate known as a diaphragm. Very similar in construction is the black box used by the person listening to the conversation at the other end of the wire. The voice now projected into the transmitter produces vibration in the air, which in the form of waves beat against the metallic diaphragm in the transmitter. Immediately this diaphragm begins to vibrate and an electrical transformation takes place. The sound waves are transformed into electrical impulses. These impulses travel along the wire to the distant receiver, where other similar transformations take place and the impulses are changed back into sound waves which beat upon the diaphragm of our ear and are interpreted as words.

#### Similar to Telephone

In radio it is precisely the same, save for the fact that the electrical impulses are not traveling along wires, but rather through space. The sound waves created in the studio are directed into the microphone and carried through a similar electrical transformation, becoming electrical impulses or waves, which are intercepted by the receiving aerial, changed back and reproduced to us in the form of sounds. This is the fundamental action of radio and telephone communication systems.

When listening to the radio set we must bear in mind that the atmosphere which we breathe is continuously charged more or less with electricity. Its presence interrupts radio reception at times and such interruption is often termed "static interference." It is unfortunate that this little word "static" has become so popular, for to-day every little ailment of the receiving set or its operation is diagnosed as "static." That this is untrue I will prove tion? Not many I assure you. Here is in a later chapter. Oftentimes the lay-

broadcast signals above the attendant noises. This is not true, because amplification will incidentally increase the disturbances in proportion. During electrical and thunder storms true static charges are very severe. The layman is cautioned for safety's sake to refrain from listening in during such storms. The danger does not lie in a direct lightning hit but rather in the surge of electricity, often of great

#### Possibilities of Radio We have now laid the groundwork of

radio, the science, and before concluding this chapter it will be of interest to cite a few of the possibilities of radio. The radio receiving set during the last few years has become not only a factor in American business life but also the means of entertainment for a nation. Undoubtedly the farmer is most benefited by the widespread use of radio. His isolation has now become a thing of the past. Radio brings to his very fireside things which up to a few years ago he waited to come through the mails. The weather and market reports are of great value to him-he enjoys the entertaining features—the lectures the news and the sporting events. The storekeeper increases his prospects for business by posting bulletins on the results of sporting events, thereby increasing the interest of his patrons. Religion casting its voice through the mystic microphone sends the word of God to thousands of shut-ins. Newspapers have added its service to their quest for and distribution of news. Secret communication is not yet a realized fact, yet who knows what the future has in store? A few years ago the public would have scoffed at the idea of broadcasting music through the air without the use of wires, and yet to-day it is a possibility realized. Not only the voice and music but actual photographs have been transmitted through space.

### Old King Kerry—A Radio Election Story

(Continued from page one)

from the inner precincts of Bailey Club. Joe went to work at once on the speech, writing a first draft and eliminating all the three-syllable words from his second. It would be necessary to retain just a few big words to avert suspicion. The fertile brain again fulfilled its mission. Joe would start the speech with one fine word, a mouth-filling phrase, and, after overcoming the initial obstacle, Jimmie would read through the remainder in sim-

Asbury Hadden, for his part, went into consultation with his campaign manager. It was necessary to meet the maneuver of the King-Kerry combination in having the Nicholas Jazz Band come to town. Against the protests of his manager Hadden decided to install a loud speaker in the high school auditorium.

ple English with facility and ease, as

though it were his own.

Folks would come to hear the Nicholas Jazz Band and the speech of Jimmie Kerry. After the OIC program was over they would hear Asbury Hadden close his campaign in an outburst of eloquence. His manager thought it foolish letting the audience listen in on a band hired by the opposition, but he was voted down. Saturday night arrived all in a rush

Mythington was in a state of breathless suspense. The younger set arranged dances for the night, anticipating the music of the Nicholas Jazz Band. The substantial citizens of the town decided to make a gala occasion of it by attending the high school auditorium for that strange verbal duel-James Kerry speaking over the radio and Asbury Hadden speaking from the platform.

Hadden directed the radio shop to install its receiving set with a maximum of efficiency. He would brook no charge of failing to give Kerry the best possible hearing in this critical moment of the

Joe King felt the battle of his life was

speech eight times. With every rewriting on the stage. The Nicholas Jazz Band he pruned the difficult words. Finally the only troublesome sentence remaining was the opening one. It read: "Metaphorically speaking, the lamb has twisted the lion's tail in this campaign; but, ladies and gentlemen, retribution will be just and swift." Then Jimmie was to say: "It appears, my friends, that Asbury Hadden thinks I use big words. Well, to suit him, I'll talk in language that a child can understand. Mr. Hadden himself ought to get my mean-

After that would come Joe King's best political stuff, in Jim Kerry's natura

Joe accompanied his candidate to the broadcasting studio, anxious to hear how the speech would sound. There had been no need to type it, for Jim would be heard, not seen, by his audience. Kerry took his seat near the microphone and, although listeners in could not know it, Joe

The high school auditorium was filled to loud speaker occupied a central position | over and whispered:

played "It Ain't Goin' to Rain No More, No More." Wild applause followed. The band played two other popular songs, meeting equal applause, and a stillness

#### Kerry Goes On the Air

"The next voice you will hear," said the announcer. "will be that of James Kerry, candidate for Mayor."

A hush fell over the audience. Asbury Hadden gripped both arms of his chair, although pretending to be at ease. The receiving set thus far had worked with remarkable efficiency, so much so that when the great Mr. Nicholas coughed before the number started his cough echoed clearly through the hall.

In the studio Jim Kerry was growing nervous. His eyes were on the high school auditorium, even if he could not see it. At a given signal he prepared to read the manuscript King had written. The very first word stumped him. Joe's handwriting never was too plain. What was that the last row. Asbury Hadden sat alone on | word? Was that an "m" or a "w"? Was the platform—not entirely alone, for the | that a "ph" or a "gh"? Jimmie leaned

### New Low Power Record Established

Clair Foster, operating a small homemade radio transmitting station at Port Alberni, B. C., established a new world's record when he communicated across the Pacific and over 1,000 miles of Australia, while more than a quarter of the distance was in daylight.

It is a well known fact that daylight transmission is very much more difficult than night and that sending over the sunset or sunrise line offers still greater obstacles to the travel of radio waves.

The most remarkable feature of Foster's ahead of him. He rewrote Jin Kerry's a transmitting vacuum tube, he used an this difficulty is eliminated.

ordinary receiving tube, supplied with heavy duty B batteries intended for reception purposes. The total power required by the transmitter was only 13 watts, a fraction of the power used by the ordinary electric light bulb. Electric flatirons, for instance, usually use about 250 watts.

Engineers, in discussing this record. ascribe the efficiency of transmitter to the steady, unwavering signals which it emits. The usual amateur transmitter draws its power from alternating current mains. record, however, is the extremely small | causing a hum, which detracts from the power used by his transmitter. Instead of steadiness of signals. By using batteries

"Say, Joe, I can't read your writin'. What's that word?"

Joe knew the speech by heart. "Metaphorically," he replied.

Jim cleared his throat and began the speech.

"Metaphorically speaking," he said, "the lamb has twisted the lion's tail in this campaign; but, ladies and gentlemen, retribution will be just and swift."

In the high school auditorium a startled audience came to life. Every word that Jim Kerry had whispered to Joe King came across the radio as clearly as though it had been trumpeted through a thousand borns. Every man and woman in the audience had heard Jimmie say, "I can't read your writin'." They had listened to Joe reply, "Metaphorically." They had heard Kerry launch into his speech, totallyunaware of the prank that possibly the radio operator at the broadcasting station had played on him.

Jimmy Kerry went on with his speech to the bitter end. He had no means of knowing the uproar in the high school auditorium. The first person to catch on to the trend of things was a woman in the fifth row. She tittered. A man beside her laughed. People began to nudge one another. A moment later the laughter was open, spontaneous and hearty. Every remark of Kerry's as he innocently continued provided fresh opportunity for

When it was over there remained nothing for Asbury Hadden to say. The "Daily Dawn" issued an extra, with a red streamer across the front page, "Say, Joe, I can't read your writin'." The report of the OIC broadcasting followed at length.

Radio has elected many men to office. It has defeated many others. In the Mythington campaign it elected Asbury Hadden by an overwhelming majority, defeated James Kerry by a landslide and sent Joe King, boss of Bailey Club, to a political oblivion from which he never emerged.

### Some Musical Instruments Make | YOU CANNOT DUPLICATE THIS BARGAIN! Excellent Radio Reproducers

The Sound Board of an Ordinary Second-Hand Piano if Actuated by a Powerful Loud Speaking Unit Will Give Perfect Reproduction

By H. G. Silbersdorff

HE public has heard much during the last few weeks regarding the recent experiments of John Hays Hammond jr., in which it was found that it was possible to make most any piano give forth sounds duplicating those of the church organ.

With the resonant qualities of the piano in mind, and the possibility of applying these valuable properties in the construction of a mammoth loud speaking device, a new use was found for this most popular instrument.

ing. Absolute true reproduction of most natural. all sounds that enter the microphone When using the remodeled guitar these notes having a frequency so tone. high that they are rarely heard in Three Elements Necessary for Quality

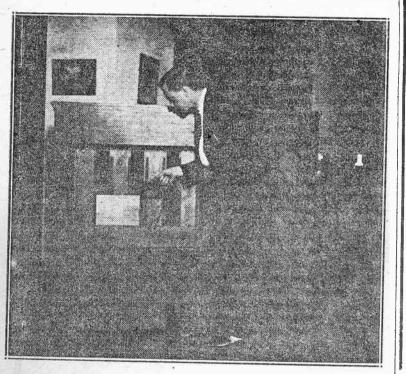
the average radio loud speaker. whom had visions of similar opera- and small vibrations equally well.

David Grimes, chief engineer of | well. In the case of the violin high David Grimes, Inc., built up such a notes are produced with remarkable speaker. The results were astound- fidelity, the violin selections sounding

at the broadcasting studio was ob- quite the opposite effect was obtained. Low notes and exceptionally tained, although the signals all were high notes were reproduced, some of somewhat louder and more mellow in

Returning to the more serious side, A demonstration of this speaker the piano board gave best results, as was given recently to a number of it acts like a large diaphragm and newspaper radio editors, most all of successfully accommodates both large tions being performed by radio en- There are three elements which

thusiasts all over the country and must be taken into consideration.



David Grimes in recent experiments proves that most of our presentday loud speakers fall short when compared to a piano sounding board set into vibration by a powerful unit. Treble and bass notes, soldom heard on other types of speakers, are clearly reproduced with this contringnce.

the second-hand piano dealer.

baby grand piano which.

amplification. Therefore, it is a tions, and with sufficient power besimple matter to see the transformers on the audio side work in an important role. Many of the transformers in use to-day have decided peaks throughout their curves, resulting in many of the important notes being lost entirely.

After selecting the set which meets this requirement, it is necessary to add additional stages of power amplification. Care must be taken that no distortion is had at this point. From the output terminals of this amplifier connections are made to the loud speaking unit. This unit is similar to those used on present day cone speakers, the cone itself, of course. being removed.

The drive pin or push rod of the unit is fastened to some point of the sounding board on the piano. This hind it to start vibrations in our

#### Square Piano Best

power amplifier and then a speaker a few of the higher ones. Other ber of interesting experiments may only to the higher or medium high be carried on by the experi- sounds. menter, using various objects as the There is little doubt but that the diaphraem.

violin or a guitar works remarkably reproduction.

the prospects of a lively season for First, the broadcasting itself must be perfect. If this equipment is not so There was a time when mother's designed that it will actually transpet rolling pin was unsafe on the mit the very high and very low notes, kitchen cabinet and finally was sacri- we cannot, hope to reproduce them ficed on the altar of radio development regardless of how good our followand provided a form for more than ing equipment may be. Unfortunone tuning coil. Now, little William ately there are but few of our looks with wistful eyes at mother's stations which are capable of sending out this perfect form of transmis-When using this type of speaker it sion. Second, we have the receiver is highly important that the receiving and amplifier. This unit is called set be capable of covering all high upon not only to detect the signal, and low notes with good quality but to increase it to such propor-



Experimenting with a violin and a radio reproducing unit

point varies in most instruments and diaphragm. This must necessarily will have to be determined by experi- be great in the new system, due to the weight, size and stiffness of the sounding board. Third, we have the The recent demonstration took | matter of the unit and diaphragm. place at the home of Mr. Grimes at | While this point is last mentioned,

Grasmere, S. I. Here he used a it is of prime importance. Some standard inverse duplex four-tube diaphragms will vibrate well only on (199) receiver. To this was added a the lower notes, cutting off all but unit. An upright piano was used speakers, and those which are in the With the above equipment a num- great majority to-day, will respond

cone type speaker is a great step The resonance chamber of a toward the ultimate goal of perfect

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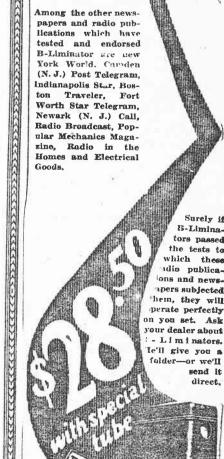
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low altitude and equal in wave length Ful-Wave does not overheat—does not blow your lighting fuse. It supplies all to the wave length received. One the convenience of keeping your bat-teries fresh, powerful, of making them end is grounded through a resistance and at the other is connected to the ast longer, as well as the convenience ground in the usual manner through of its outstanding superiority. an inductance. This system is ex-If you prefer concentrated double-quick tremely directional in the direction toward which it points. It is, therefore, not practical for radio broad-

cast reception.

The best ground connection obtainable is one which leads direct to the earth and is connected to some metal conductor buried in a moist soil. Another method of obtaining a good direct ground is by burying copper strips directly under the antenna and several inches below the surface.

If it is impossible to obtain a good buried ground the next best is connection to water pipes. Never attach a ground wire to a gas pipe if best results are desired. When connection is made to a water pipe a jumper should be connected across the meter to the pipe leading to the main in the street. This insures a better connection, as usually joints made in pipes are filled with white lead which is a high resistance material. Hot water and steam heat

systems make fair grounds. Where the earth is composed largely of sand it is impossible to obtain a good earth connection, due to the high resistance of sandy soil. In such cases a counterpoise offers the only solution. This consists of a number of wires spread under the antenna, if possible, although it is not absolutely necessary that they be directly under the aerial. The wires should be supported off the ground and well insulated. The height may vary between two and ten feet. General opinion is that the counterpoise should consist of about twice as many wires as employed in the aerial. However, this latter point is best determined by experiment. The builder should start with one wire and increase the number until the best results are obtained. The main point to bear in mind is that there should be capacity between the aerial and counterpoise and counter-

Bank President Says Radio Is an Investment in Health "Radio has performed a miracle in relaxing the life of the home," says John J. Pulleyn, president of the Emigrant Savings Bank, in his book-

let, "Five Steps to Fortune." "There are times," the booklet continues, "when the best investment we can make in our own future is in our health, when the best way we can fit ourselves for more active and productive work is to take an extra long vacation, or to buy an automobile, or to provide certain minor luxuries in our home life which will promote our sense of rest and relaxation. The radio, for example, instead of forcing younger people to go out of the home for music or enjoyment, has brought the finest entertainment right into the home itself. And entertain-

lumbia University, recognized authority on Toroid Coils. ment itself is one form of relaxation "So do not be surprised when I say that the third step to fortune consists in laying aside enough in the savings bank month by month (over and above our basic reserve or living insurance) to enable us when the right time comes to have enough money to purchase an automobile or perhaps a radio or some other means to relaxation which in the old days would have been called a luxury, but which to-day has become very nearly



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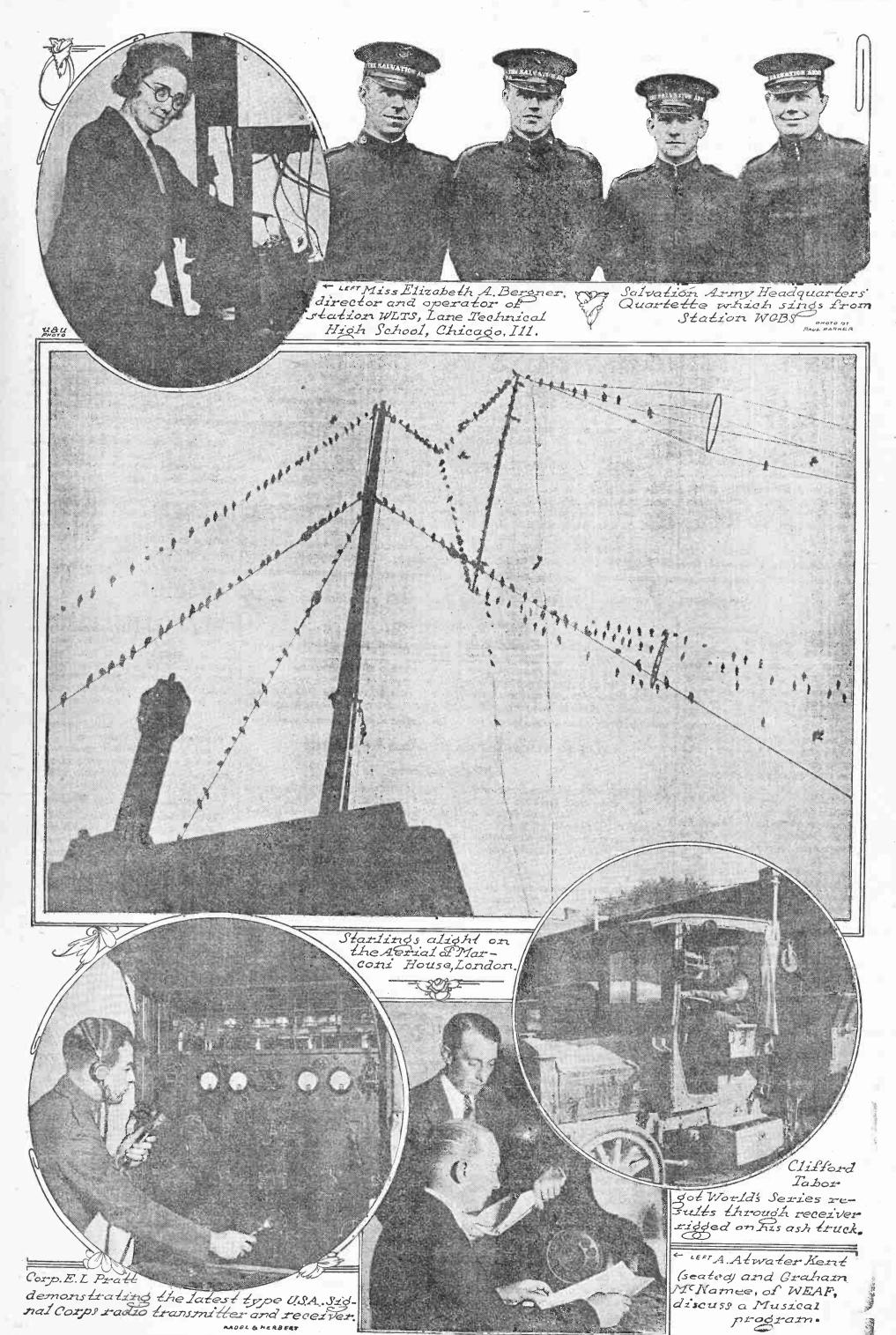


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### Navy's Radio Sends Half-Way Around World

With the additional funds and facilities made available for war the navy, in conjunction with commercial electrical manufacturers, made large and progressive strides in the development of radio. Radio telephony was made practicable. The broadcast radio transmitters of to-day are based on these war developments.

During the war the navy took over the commercial radio stations and modernized their apparatus. For example, a highpower radio station on the Atlantic sea coast was then under construction, and there was being installed apparatus of British design, which the navy considered of doubtful practicability. So the navy installed apparatus of American design, and this apparatus is still in operation at that station.

#### Service During the War

Long before the war was over the navy had in operation the largest radio set in the world. An interesting phase was the organization for handling radio traffic between the United States and Europe. The navy system not only handled the messages for the United States naval forces on the high seas, but also those between the War Department and the American Expeditionary Forces in France. The transmitting keys of all the Atlantic coast high-powered radio stations - namely, Marion, Mass.; Sayville, N. Y.; New Brunswick, N. J.; Tuckerton, N. J., and Annapolis, Md.—were controlled from a single room in the Navy Department Building in Washington.

From that room the Secretary of the Navv could communicate instantaneously with France, Italy, England and all our outlying possessions, as well as with men

The navy soon ascertained that this

radio operators were sent to France to immediately increased the speed of hanilling the messages. Early in 1918 the construction by the navy of an additional high-power radio station in France was commenced. This station. La Favette. was of 1,200 kilowatt capacity, and remains the highest power radio station in the world to-day, although there is one larger station in this country now under

It is interesting to note that in the interval between 1912 and 1919, a period cf only seven years, the 100 kilowatts station at Arlington had become obsolete and the newest stations were all in the order of 1,200 kilowatts, such was the progress in radio.

The navy has not rested in its endeavors since the war. There has been developed under navy specifications a modern radio transmitter, which has proved to be most practical for efficient long-range communication on merchant ships.

The navy's radio compass system has been improved, and by this compass we assist vessels in making their ports in fogs, thus enabling them to complete more quickly their voyages. This service rendered by the navy makes possible the saving of thousands of dollars to organizations engaged in foreign and coastal As for the future, the navy is engaged

in some remarkable developments, some of which will have commercial application. There is being established the first lowpower, long-distance radio network in the world. At least the navy will be the first to have this new type of system on a practical traffic-handling basis. This is

rapidly increasing traffic load. So naval has taken a leading and most active part during the last few years. While it might help man the French stations, and this not spell the doom of high-powered radio stations, it certainly will result in large

> savings in operating costs. Eatly in the century the navy realized the importance of radio in modern naval warfare; but the commercial demand was not large enough at that time to warrant investments of suitable amounts of money on the part of the manufacturers. The money-making possibilities of radio in competition with cables and telegraph did not seem to be very alluring.

The field of ship and coastal radio was a comparatively small undertaking for large business concerns. In other words. in the pre-war days the commercial demand for radio was so small as to make rapid technical development an imprac-

In 1911 and 1912 radio in this country was controlled by British and German interests, the European countries being interested in radio as an adjunct to their huge foreign trade, and also because they wished to bind more closely their colonies with their home government. The United States had no such incentive. her merchant marine was small and our colonies were relatively unimportant, as compared to the continental United States. Because of this state of affairs the navy, except in a few minor instances, had to purchase its radio equipment in Europe. In-1912 the navy had on board its ships radio apparatus made in Germany.

After the war the navy had to return the private stations it had taken over for war use; however, the former Germancontrolled stations were retained by the navy permanently. Many of the other private stations were owned by a corporation system would be insufficient to handle the the result of research, in which the navy controlled by British interests. The United population of the United States.

States was again faced with the possibility of having her trans-oceanic and coastal communications in foreign hands.

Fortunately, one of the leading American electrical manufacturers was negotiating the sale of some very important radio patents and apparatus to these foreigncontrolled corporations. The patents and apparatus were American inventions and had been used by the navy during the war with great success. The navy approached this electric company and requested them, on the grounds of patriotism, to withhold the sale of this patent to any but American organizations. The company co-operated very willingly with the navy, but there were no American companies organized which had sufficient capital to handle the matter in a satisfactory manner. The navy could not purchase the patent because of the necessity for retrenching its expenditures. So it was suggested that this electrical company organize a radio company of its own and purchase the British interests in the foreign controlled company under discus-

Most important to the navy, however, is that we do not have to depend on foreign countries for our apparatus, and it is interesting to note that the early desire of the navy to create a source of manufacture of radio equipment in this country helped speed the development of "radio broadcasting."

This is in entire accordance with the methods the navy has practiced in many other scientific and engineering fields. Thus, the navy is not only a protection to the country but it also renders important service in peace, the value of which fe persons realize, but which are certainly-o direct economic benefit not only to th business interests but also to the entire

### Foreign Fans Show Interest in Radio Expositions

try on the same system as that already in use at Greenwich Observatory.

As regards the general display of receivers and components, there was nowhere anything of a revolutionary nature. General improvement in design and construction was very marked and cheaper prices prevailed, as compared with conditions a year ago. Many manufacturers had super-heterodynes on show, for this type of receiver has begun to be very popular in England during the last twelve months. Whereas a year ago there were no suitable component parts for super-heterodyne construction, there is now a varied collection.

Loud speakers of the horn type seem to be rapidly giving way to those of cone and other designs, as is the case in this country. The famous Amplion loud speaker is now available in this new form, the new models being displayed for the first time at the "Narmat" exhibition, and, apart from their excellence of performance, they are made up as very handsome pieces of furniture.

England also appears to have awakened to the need for battery eliminators, and many different types of these useful radio auxiliaries were in evidence, some of them combining in one instrument the functions of both A and B batteries.

The second great German Radio Exhibition was held in Berlin from September 4 to 13 in the great hall specially built last year for radio exhibition purposes.

In some respects this exhibition was particularly epoch making, for, coincident with its opening, the German government rescinded many of the regulations which have up to now so greatly hampered the progress of radio in Germany. There is no limit to the wavelength range which may be covered by a radio receiver, either manufactured or home constructed, and regeneration may now be used in an unrestricted manner. Manufacturers are now left free to make use of any technical improvements what-

Amateurs also are given much greater freedom, so that we may look for greatly increased activity on the part of German amateurs during the next twelve months.

The effect of the abolition of these restrictions was immediately apparent in the exhibits at this year's radio exhibition. Receivers were to be seen every- embarrassment. where which permit reception on any wave length, from the lowest to the highest. This may sound strange to the American reader, who has freedom to receive game play by play. We could hear the radio sets.

(Continued from page two)

on 20,000 meters if he wants to, but is | Koenigswusterhausen, operates on 4,200 not particularly interested in so doing, but in Germany there are countless amateurs who are so interested and have been prohibited from doing so for many years.

The number of exhibitors contributing to the success of the show was 280, and it was apparent that the radio industry Also their biggest broadcasting station, in Germany is now on the road to stability.

### Radio Aids Isolated Men in Maine

By Walter J\_Fenton

HE old feeling of romance which came from the utter loneliness is gone now," said Commander Eugene F. MacDonald jr., in charge of radio communications with the MacMillan Arctic expedition, in a recent interview published in this section.

That's one way of looking at it, but witness the case of the two city chaps who recently traveled to the rock-bound coast of Maine for a week's sojourn. One of the two had not been to the wilderness for some years and, acting on past condions primed himself for the usual questions of these people in the lonely sections of the country. What is the latest song hit in New York? This was the first question he was usually asked when going into the mountains of Pennsylvania. Questions of the political situation followed and the reviews of current plays came in their own order.

In starting for the Maine coast this visitor was all prepared for the questions. To his surprise not one of the questions was asked, but his own ignorance was brought to the surface on visiting the home of an old sea captain.

"Well, how did you like the world series? was the first question, and this from the feminine head of the household. The smarty who had prepared himself looked at his companion. Together they stared in bewilderment at their hostess Why, the last game was only played yesterday, so how could these two city boys know the scores when they were motoring toward their destination.

"You don't mean to say you were not interested," continued the hostess. " wouldn't have missed it for anything."

"Oh. did you get to the first game?" asked the visitor in an effort to cover his

"Why, I've been to every game," was the retort courteous. "This radio set of mine brought in the cheers of the crowds, and I really enjoyed it more than if I had been there, because each play was explained by one trained to catch what I might have missed." Their visit ended, the two city chaps

continued to the home of another old friend on the other side of the hill. This friend, too, was a former sea captain. He had guided vessels across the ocean when radio was practically unheard of. After the usual greeting the conversation drifted to current events. The city chaps went into a discussion of the recent submarine disaster as a possible means of interesting their host. From this the subjects drifted until they reached Sunday sermons. The nearest church to this former captain of the seas was five miles away. To get there on Sunday meant a big sacrifice, shared with his wife, his only other companion in this lonely house which looks out on the ragged rocks and bounding sea.

Now the hig surprise came to the city chaps when they tried to quote some sermon erroneously. They were politely corrected by the aged couple, who announced that the sermon was delivered in Boston two weeks previous and that they both had listened attentively to the speaker's

Romance may be robbed by radio, but the comfort and education provided these residents of the lonely settlements are indeed a compensation.

These retired sea captains, waiting for the call of the Almighty, spending their last days on the open coast of Maine, their porches headed toward the woodland and their bedroom windows opening on to the surf, are certainly deriving an unthoughtof comfort from their radio sets, no matter how small.

And in Venezuela they have adopted a law prohibiting the use of radio sets in the day time. This, however, has been done so that the workmen after their daily luncheon will return to their tasks instead of devoting the afternoon to their

though it has a long, long way to go yet. Up to the present the universal type of tuning coil in use in Germany has been the fine wire honeycomb coil, but this year sees the commencement of the lowloss era, and straight line frequency condensers have also appeared in rudimentary form. The old fixed condensers with arbitrary values are giving way to more efficient instruments actually possessing the capacity marked upon them.

Head phones and loud speakers also showed a marked improvement over last year's models, and the general quality of instrument work has improved.

### Czechoslovakia Shop Window

This go-ahead little country, one of Eucope's latest converts to the science of radio, added a radio section this year to its annual fair at Prague, held between September 6 and 13, and with commendable enterprise did its utmost to attract not only the foreign visitor but also the foreign exhibitor.

To this end considerable special reductions in fares were made on the Czechoslovak state railways, and were applicable not only to natives but also to foreign visitors, for whom passport and other formalities were specially facilitated. Visitors to the fair, which included a multitude of industries other than radio. were estimated at 400,000, of whom more than 6,000 were foreign buyers.

Special pavilions were erected to house the radio section of the fair and thirtyeight aerials, supported by thirteen masts. were provided for the use of exhibitors. Batteries of large loud speakers mounted on towers filled the exhibition grounds with music. An area of 5,000 square meters was devoted to the radio section and a special pavilion divided up into cubicles was arranged for loud-speaker demonstrations.

Most of the radio apparatus on view was of foreign manufacture, but such Czechoslovakian instruments as were to be seen followed closely the methods of design and construction common to other countries new to the art. The products of nearly all the leading foreign manufacturers, including the Radio Corporation of America, were very much in evi-

Very active business is reported as the result of Czechoslovakia's enterprising radio fair, both in the home and foreign markets, and about 25 per cent of the exhibitors applied for space to exhibit at the next spring fair, to be held from March 21 to 28, 1926.

### Practical Information on Radio Receiving Antenna Construction

The Aerial Is One of the Most Important Units of the Receiving Circuit; Glass or Porcelain Insulators Suggested; Enameled Wire Best

By Morton E. Stanley

NE of the most neglected units of a radio receiving installation is the antenna system. The average radio fan does not stop to consider that the antenna system is the most essential unit It is literally the connecting link between the transmitting station and of the circuit and if poorly constructed will not give satisfactory results. the receiving apparatus.

Radio writers seem to have neg- able distance from a broadcasting lected the device that receives the station he has the advantage of being radio energy from the ether and sup- able to erect a high aerial without plies it to the receiving apparatus—
the antenna system. The aerial is it is solely the antenna that causes

almost any kind of a conductor ele- the best sensitivity and selectivity vated above the earth and fairly well will be had. insulated, such as a tin roof, bedstructed antenna system is employed.

-Not only is the aerial important

mon and well known type.

type may be eliminated. They are ing aerial. usually difficult to erect and will offer no better results than the common inverted L or T type antenna.

thinking of the multi-wire antenna 14 or No. 12 wire will be found satisis that it often causes a set to tune factory. Bare wire is all right when "broad"; that is, make it less selec- it is new, but copper corrodes, intive. Inasmuch as there are several creasing the resistance of the wire. hundred broadcasting stations in the This is because the currents in a United States operating on wave radio receiving aerial flow on the surlengths between 200 and 550 meters face of the wire and do not penetrate and less than ten kilocycles apart further than a thousandth of an inch. poor selectivity is always objection- It is easy to see that if the wire is

The Proper Height

problem that baffles the radio fan wire will prevent this. Stranded wire when he is considering the construc- should not be used unless it is tion of a new antenna. As a matter enameled. of fact, there are no definite data | Next in importance is the loop anavailable giving any constants on this tenna. This type has many advan point. It is the general consensus of tages, but it cannot be employed with opinion, however, that the higher the a receiver which does not have two aerial the better the results. This has or more stages of radio-frequency been proved in practice time and time amplification. For this reason it is again. One objection to an extremely most commonly used with a super high antenna is that it also tends to heterodyne. Its chief characteristic make the receiver tune broad, is that it is extremely directional Therefore, if the radio fan is for- This is a great aid in tuning and add. tunate enough to be located a consider- to the selectivity of the receiver.

one of the most important parts of the set to tune broad. This is not any radio set, whether it be trans- true. A poorly constructed receiver will not be selective even if it is used An efficient antenna demands care- with the best possible antenna. The point is that with the proper comful design in spite of the fact that bination of the receiver and antenna The fan who lives within a few miles from a transmitting station has a

spring or small coil of wire, will different problem to solve. He. work. The difference between a good usually lives in a city and has many or a poor antenna will not be notice- obstacles which prevent the construcable on the reception of stations lo- tion of a good antenna. A long, low cated within 100 miles of the receiving apparatus but is very apparent However, it will not be a good DX on the reception of those farther "getter." Therefore we must reach away. This fact makes many DX "happy medium" between these two fans wonder why it is impossible to factors. It is safe to say that an receive distant stations when the best antenna having an effective height radio receiver money can buy is used. of between twenty-five and forty In almost every case of this kind the feet will be satisfactory for allexplanation is that a poorly con- around radio broadcasting reception. The Effective Height

but its companion, the ground, is of is the average distance between it The effective height of an aerial equal importance for good results.

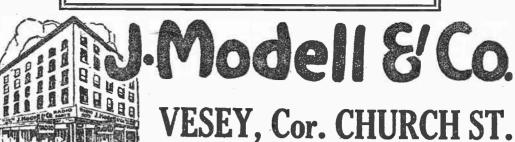
The ground connection is considered
In the case of an aerial erected on an fore should receive careful considera- difficult to figure out the effective tion. A good antenna without a good ground; or vice versa, is like the therefore, be the purpose of this grounded. On the roofs of these article to depict the different types buildings all metal fixtures are of antenna systems that are suitable usually grounded for protection for receiving work and to tell their against lightning. In this latter case respective advantages and disad- the only alternative is to approximate the effective height.

There is very little difference in the results obtained from an inverted Antenna systems are of three dis- L and T type antenna. The one which tinct types. These types are com- is the most convenient and easiest monly termed the closed circuit type to construct should be the one or loop, the condenser type and the selected. It often has been said that open circuit type. The latter is the the T type antenna is less directional most common for radio broadcast re- than the inverted L. However, this ception and may be subdivided into will not have much effect on the reseveral classes. Each of the fore- ception of broadcast signals. Where mentioned types of antenna has a the directional characteristic of an special use to which it is best adapted antenna is noticed most is at the -with the possible exception of the transmitting station. The only dicondenser type aerial. We will first rectional antennæ for reception are concern ourselves with the most com- the loop and Beverage types. These will be considered later.

By subdividing the open circuit The insulation and kind of wire type antenna into classes we have used in an open circuit type antenna the vertical wire, the inverted L, the is important. A leaky antenna will T and the umbrella. Incidentally never give satisfactory results. It is some of these may be divided into generally considered that either separate classes. This latter dis- glazed porcelain or glass insulators tinction deals with the arrangement are the most satisfactory under all of the wires. For instance, the in- conditions. A good insulator five verted L or T type may be either of inches in length at both ends of the cage or parallel wire construction. antenna is all that is required. It However, for ordinary receiving pur- might be of interest to know that poses the multi-wire antenna offers glass towel rods, which may be purno better results than the ordinary chased in the "five and ten," make excellent insulators capable of han-For practical broadcast reception dling a hundred times as much voltthe vertical wire and the umbrella age as normally exists in the receiv-

Copper wire is generally considered best for antenna construction Another point to consider when due to its low resistance. Either No. corroded the currents will have to pass through this thick coating which is a poor conductor as com-The proper height seems to be a pared to the wire itself. Enameled

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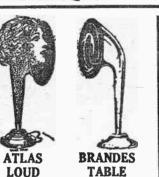
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## Additional Radio Programs for the Week

(Continued from preceding page) WHAP-Brooklyn, N. Y.-240 WAHG—RICHMOND HILL, N. Y.—316 WAMG—RICHMOND HILL, N. Y.—316
12 noon—Musical program.

WOR—NEWARK—405
6:45-7:15-7:45 a. m.—Gym class.
2:30 p. m.—Dr. George Little, "The Cairr Terrier."
2:45 p. m.—Eugene Spier, pianist.
3 p. m.—Jack Smith, entertainer.
3:15 p. m.—Jack Smith, entertainer.
3:15 p. m.—Archie Slater's Orchestra.
6:15 p. m.—"Words Mispronounced."
6:17 p. m.—"Sports," Bill Wathey.
6:30 p. m.—Shelton dinner music.
7:20 p. m.—News bulletin

WGCP—NEWARK—252

WGCP—NEWARK—253
m.—Edna Josephs, planist,
p. m.—Bill Mendez Orchestra
m.—Hughie Woolford, planist,
p. m.—Studio program,
p. m.—Sylvia Schatz, planist, WAAM-NEWARK-263

11 a. m.—Happy Hour. WFI—PHILADELPHIA—395 p. m.—Tea Room Ensemble.
p. m.—Delaware County Federation Clubs:
6:30 p. m.—Concert Orchestra.
7 p. m.—Dance Orchestra.
8 p. m.—The Barkinites.
8:30 p. m.—'Pop' concert.
9 p. m.—Concert Ensemble.
10 p. m.—Goodrich "Zippers."

10 p. m.—Goodrich "Zippers."

WLIT—PHIADELPHIA—395

12:05 p. m.—Organ recital.

12:30 p. m.—Concert orchestra.

2-8 p. m.—Concert orchestra; recital.

4:30 p. m.—Artist recital.

7:30 p. m.—Dream Daddy.

WCAU---PHILADELPHIA---278 WOO---Philadelphia---508 . m.—Grand organ. 4:45 p. m.—Grand organ; trumpets 7:30 p. m.—Dinner music. WIP—Philadelphia—508 WIP—Philiadelphia—508
6:45 a. m.—Setting-up exercises.
1 p. m.—Luncheon music.
3 p. m.—Philips-Jenkins Vocal Studio.
6:05 p. m.—Pagoda Orchestra.
7 p. m.—Roll call and birthday list.
8 p. m.—"The Sesqui Centennial."
8:15 p. m.—The Laserow Quartet.
9 p. m.—Imperial String Quartet.
10:05 p. m.—Joe Ray, Night Hawks.
6:30 p. m.—Billy Hayes's Orchestra.
7:30 p. m.—Symphony Orchestra.
7:30 p. m.—Secital by artists.
9:15 p. m.—Central radio artists.
9:15 p. m.—Frank Cook, songs.
10 p. m.—Sesqui-Centennial Hour.
WPG—ATLANTIC CITY—300

m.—Sesqui-Centennial Hour.
WPG—ATLANTIC CITY—300 30 p. m.—Morton tuncheon music,
30 p. m.—Tea music,
30 p. m.—Billy Rocap, "Sports."
45 p. m.—Organ recital.
p. m.—Dinner music,
p. m.—'World-Wide Excursions."
15 p. m.—Concert. p. m.—Dance orchestra.
WHAR—ATLANTIC CITY—275 b. m.—Seaside 1710.
c) p. m.—Health talk.
c) m.—Seaside Trio.
c) m.—Studio concert. m.—Studio concert.
WGY—SCHENECTADY—380

8 p. m.—The Happiness Boys,
8:30 p. m.—Trio concert.
9 p. m.—Home entertainers.
10 p. m.—Warner M. Hawkins.
10:10 p. m.—Concert quartet.
10:25 p. m.—Warner Hawkins, pianist.
10:40 p. m.—Avo Bombarger, tenor.
10:50 p. m.—Avo Bombarger, tenor.
11-12 p. m.—Meyer Davis's Orchestra. wGY-SCHENECTADY-380

p. m.—"Survey of Sociology."

2:30 p. m.—Organ recital.

6:30 p. m.—Dinner program.

7:30 p. m.—WGY Book Chat."

7:45 p. m.—WGY Orchestra; Clarice

Warren, contralto. 11-12 p. m.—Meyer Davis's Orchestra.

WJZ—NEW YORK CITY—455
0 a. m.—Women's hour.
1 a. m.—News.
p. m.—Ambassador Trio.
4, 5:30, 7:30 and 10:30 p. m.—News.
105 p. m.—Marley Sherris; barytone.
1:20 p. m.—John B. Daniel, readings.
1:30 p. m.—Astor Tea Music.
1:32 p. m.—Market Quotations.
1:50 p. m.—Financial summary.
1:30 p. m.—N. Y. University Course "Market Price Making." Prof. Reid I p. m.—United States Army Band, p. m.—United States Army Band, p. m.—Royal Salon Orchestra. 30 p. m.—WGY Orchestra. 30 p. m.—Organ recital. WRW—TARRYTOWN, N. Y.—273 6:30 p. m.—N. Y. University Course; "Market Price Making," Prof. Reid L. ### WRW—TARRYTOWN, N. Y.—27

9:05 p. m.—Dick Tobin, pianist.
9:20 p. m.—Euke Duo.
9:40 p. m.—Melody Boys Orchestra.
10:20 p. m.—Dick Tobin, planist.
10:20 p. m.—Buck Duo.
11:05 p. m.—Euke Duo.
11:05 p. m.—Royal Orchestra.

#### WGR—BUFFALO—319

6:30 p. m.—Digner music. Clung.
p. m.—Bernhard Levitow's Dinner Concert.

WNAU—Boston—zos

10:30 a. m.—Bible readings; club talka.

12:15 p. m.—Noon service.

1 p. m.—Luncheon orchestra.

WTAG—WORCESTER, MASS.—268

12 p. m.—Natio chars.
12 p. m.—Market and weather report.
12:05-2 p. m.—Luncheon music.
4:30 p. m.—Radio Entertainment.
5:14 p. m.—"Story Teller."
8:30 p. m.—"The Larkinites."
9: p. m.—"Concert Ensemble.

m.—Silvertown Orchestra. WTAM—CLEVELAND—390

6-7 p. m.—Dinner music. WEAR—CLEVELAND—390

p. m.—Dinner concert.
p. m.—RTL program.
p. m.—Dutch master artists.
WADC—AKRON, OHIO—258

cert.

8 p. m.—Museum talk.

8:15 p. m.—Edward Rice, yiolinist.

8:30 p. m.—Steinway Concert; Maier & Pattison, pianists.

10:30 p. m.—Lorraine Grill Orchestra.

WJY-NEW YORK CITY—405

7:30 p. m.—Harvard and Princeton Musical Club Concert. 6:30 p. m.—Dinner music. 8-11 p. m.—Program same as WEAF, WTIC—HARTFORD, CONN,—476 6:30 p. m.—Dinner music. 7:30 p. m.—Talk, Professor Frede Slocum. 7:45 p. m.—Dinner music continued. WJAB—PROVIDENCE—306 WGBS-NEW YORK CITY-316 1:05 p. m.—Joe McNamara's orchestra. 8 p. m.—The Larkinites. 8:30 p. m.—Ionic Male Quartet.

10 a. m.—Timely York CITY—316
10 a. m.—Timely Talks with Terese,
10:10 a. m.—June Warren, planiste,
10:20 a. m.—Talk on Marriage.
10:30 a. m.—June Warren, planiste,
10:40 a. m.—Furniture Talk; plano,
1:30 p. m.—Scripture Reading,
1:35 p. m.—Henrietta Mayer, soprano,
3 p. m.—Interview with Jane Shore,
3:10 p. m.—Daniel Goodwill, baritone,
3:20 p. m.— Interview with Gustav.
Blum. 8 p. m.—The Male Quarte.
8:30 p. m.—Ionic Male Quarte.
10 p. m.—Silvertown Orchestra.
WEEI—BOSTON—349
6:45 a. m.—Health exercises.
7:45 a. m.—Organ recital.
8:15 p. m.—Jay Riscanan's orchestra.
6:30 p. m.—Big Brother Club.
7:55 m.—"Books and Plays." Blum.
1:30 p. m.—Dr. Goodwill, barytone.
1:40 p. m.—Theory Lessons.
1:50 p. m.—Uncle Geebee.
1:30 p. m.—Jule Anzel's Orchestra.
7 p. m.—'What's Your Radio Problem.
7:10 n. m.—Jule Anzel's Orchestra. m.—"Books and Plays,"
m.—Lost and Found; weather.
m.—Pat Gaffney, violinist.
m.—Program same as WEAF.
WNAC—Boston—289

12:10 p. m.—Noon service.

1 p. m.—Luncheon orchestra.

1:50 p. m.—Popular songs.

4 p. m.—Morey Pearl's Ramblers.

6 p. m.—New Radio Club.

6:30 p. m.—Dinner dance.

8 p. m.—Musical program.

9 p. m.—Cxford Male Quartet.

WBZ—SPRINGFIELD, MASS.—333

6:30 p. m.—Kimball Trio.

7 p. m.—Market reports.

7:05 p. m.—Talk on educational courses.

8 p. m.—Musical program.

10:05 p. m.—McEncily's Singing Orchestra. WRNY-NEW YORK CITY-259 9:30 a m.—New YORK CITY—259
9:30 a m.—News fashes.
10:30 a m.—News fashes.
10:35 a m.—Dr. Harry Finkel: "Diet."
11 a m.—Anna T. Ruche: "Insurance."
12 noon—Hour of music.
4:15 p. m.—Larsen Violin Ensemble.
4:30 p. m.—Symphony Society.
4:45 p. m.—Larsen Violin Ensemble.
7 h. m.—"Whose Birthday To-day?"
7:05 p. m.—Telegraph sportfash.
7:15 p. m.—Code Lesson. 20 p. m.—Code Lesson. 45 p. m.—Alfred W. McCann: "Foods

3. p. m.—Alfred W. McCann: "Fooda."
B. m.—Taverna Opera Company.
D. m.—"Radio vs. Wire Telephony."
D. m.—Boy Scout Band.
D. 15 p. m.—Boy Scout Band.
D. m.—Boy Scout Band.
D. p. m.—Ralph Christman: Opera story.
D. 15 p. m.—Novelty night.
D. m.—Olcatt Vall's String Enganyle. WMCA—NEW YORK CITY—341
6 p. m.—Olcott Vail's String Ensemble.
6:30 p. m.—Ernie Golden's Orchestra.
8 p. m.—Betty Brainerd: "We Women."
8:15 p. m.—Trouverlan Male Quartet.
8:50 p. m.—'The Great White Way."
Arthur L. Lee.
9 p. m.—Hardman Hour of Music.
10 p. m.—To be announced.
11:15 p. m.—Donald Flamm, dramatic critic.

10 p. m.—Silvertown Grchestra.

WRC—WASHINGTON—469

10 a. m.—Women's Hour from WJZ.

12 (noon)—Organ recital.

1 p. m.—Washington Orchestra.

1 p. m.—Washington Orchestra.

140 p. m.—Agriculturat reports.

7 p. m.—Lee House Trio. 7 p. m.—Lee House Trio.
7:45 p. m.—Smithsonian talk.
8 p. m.—United States Arny Band.
9 p. m.—Edison Hour.
10-11 p. m.—Spanish Village Orchestrs
KDKA—PITTSBURGH—309 WEBJ—NEW YORK CITY—273 p. m.—University Society Dance Or-chestra. :40 p. m.—Eugene De Bona, tenor. 3 p. m.—Edna Josephs, planist. 3:15 p. m.—Sol Angarola, uke; Edwar Colline suitar: sones. Collins, guitar; songs.

8:40 p. m.—Kathryn Connolly, soprano.

8:40 p. m.—Kathryn Connolly, soprano.

2:15 p. m.—Hock and Jerome, songs.

2:30 p. m.—Judith Roth, soprano.

2:45 p. m.—Willie Helm, zither.

2:55 p. m.—Billy Griffiths, planist.

3:05 p. m.—Marion Davis, soprano.

3:45 p. m.—Lulu Weyant, songs.

4 p. m.—Herman Streger's Players.

4:30 p. m.—Uncle Robert's Pais.

5 p. m.—Gus Gold's Orchestra.

6:40 p. m.—Sunshina talks, Billy B. Van.

p. m.—Richman Entertainers.

7:30 p. m.—Burr McIntosh, philosopher.

p. M.—Excerpts from "The High Flyer."

8:45 p. m.—Lulu Weyant, songs. composers; Symphony Orchestra.

p. m.—KDKA Little Symphony Orchestra; Antler Male Quartet. 11 p. m.—Midnight concert.
WCAE—PITTSBURGH—461 6:80 p. m.—Dinner concert.
7:30 p. m.—Uncle Kaybec.
8 p. m.—Larkin period, New York.

Flyer."

8:45 p. m.—Luiu Weyant, songs.

9 p. m.—Frank Ochs, tenor.

9:15 p. m.—Henry Levitzky, violinist.

10 p. m.—Buily Wynne's Orchestra.

10:30 p. m.—Roseland Dance Orchestr

11:30 p. m.—Caravan Orchestra.

11:30 p. m.—Alabam Orchestra.

12-12:30 a. m.—Revue and orchestra.

WNYC—NEW YORK CITY—526

6:30 p. m.—Dinner music. 9:30 p. m.—Artists' recital. 10 p. m.—Silvertown Orchestra. WSAI—CINCINNATI—326 8-10 p. m.—Program same as WEAF.
WLW—CINCINNATI—422 WNYC—NEW YORK CITY—526

1 a. m.—'Decorative Floors."

1:15 a. m.—Morning concert.

1:45 a. m.—Joe Schmitt's recipes.

2 midnight—St. George's concert.

1:0 p. m.—Market high spots.

20 p. m.—Plano selections.

30 p. m.—French elementary lessons.

p. m.—Advanced French lessons.

35 p. m.—Police alarms.

35 p. m.—Resume of meeting of Boar of Estimate. 8 p. m.—Dinner concert; talk.
10 p. m.—Recital.
11:03 p. m.—Doherty Melody Boys; ter and organ solos.
12:15 a. m.—Orchestra selections.
1:15 a. m.—Midnight Bow-wows. a. m.--Midnight Bow-wows, WKRC---CINCINNATI--423 9 p. m.—Artists' recital.

WJR—PONTIAC, MICH.—517

7 p. m.—Jean Goldkette's Orche soloist.

soloist,

p. m.—Serenaders and soloists,

m.—Dance orchestra,

wwy-DETROIT—353 6 p. m.—Dinner concert. 8 p. m.—Program same as WEAF. WREO—LANSING, MICH.—286 p. m.—Dinner concert. 15 p. m.—Orchestra; male quartet; trio and solos,

WFBH—NEW YORK CITY—273

2 p. m.—Bill Cohen's Hottentots.

3 p. m.—Kraus's Orchestra.

4 p. m.—Studio program.

4:15 p. m.—Henrietta Cross, Maurice p. m.—Artists' recital, 1 p. m.-2 p. m.—Artists and orchestra i p. m.—Studio program.
i15 p. m.—Henrietta Cross,
Abrahms.
i30 p. m.—'Tea Table Talk.''
p. m.—Original Indiana Five.
p. m.—Sam Perry.
i5 p. m.—Terney Chefs.
i1:30 p. m.—Fordham Gardens. WEBH-CHICAGO-370 0 p. m.—Dance music; songs. 2-2 a. m.—Dance orchestra; artists. WGN—CHICAGO—370
8:30 p. m.—Dinner dance music.
10:30 p. m.—Dance music.
12:30 p. m.—Dance music.
WMAQ—CHICAGO—443
7 p. m.—Orego p. recital.

7 p. m.—Organ recital. 7:30 p. m.—La Salle Orchestra. 9 p. m.—Garden talk; financial 10 p. m.—University of Chicago

WQJ—CHICAGO—448

8 p. m.—Rainbo Orchestra,
11 p. m.—Musical program,
2 a. m.—Ginger hour,
WHT—CHICAGO—400

tures,

10:30 p. m.—Entertainers,

1 a. m.—Your Hour League,

KYW—CHICAGO—538

8 p. m.—Dinner concert,

8:33 p. m.—Farm speeches,

9 p. m.—"Good Reading,"

3:20 n. m.—Talk,

11 p. m.-1 a. m.—Concert.
WCBD—ZION, ILL,—345

Orchestra; Celestial bells. WENR—CHICAGO—266

9-11 p. m.—Rauland Lyric Trio.
WOC—DAVENPORT—484

7:45 p. m.—Chimes concert. 8-11 p. m.—Program from WEAF. 12 midnight—Le Claire Orchestra.

FRIDAY

WEAF-NEW YORK CITY-498

6:45-7:45 a. m.—Health exercises.
10:45 a. m.—Health exercises.
10:45 a. m.—Cooking school.
11:05 a. m.—Marlon Schott, planist.
11:15 a. m.—Talk.
11:30 a. m.—Columbia University lec

7:30 p. m.—Story teller.
7:45 p. m.—Vee Lawnhurst, pianist.
8 p. m.—The Happiness Boys.

7 p. m.—Classical program, 8:45 p. m. (238 meters)—Musical

music. 10:40 p. m.—League of Nations Associa

WILWI-NEW YORK CITY-288

p. m.—Rhea Leddy, soprano,
10 p. m.—VLWI. Trio.
10 p. m.—John Finnegan, tenor.
110 p. m.—Talk.
110 p. m.—Rhea Leddy, soprano,
1110 p. m.—Rhea Leddy, soprano,
1110 p. m.—When Leddy soprano,
1110 p. m.—John Finnegan,
1110 p. m.—J 9:05 p. m.—John Finnegan 9:18 p. m.—'Evolution," Windle.

Windle. 9:40 p. m.—WLWL Trio. 9:50 p. m.—Organ. WAHG-RICHMOND HILL, N. Y .- 316 22 noon—Musical program.

1:30 p. m.—Talk, Maurice E. Connolly.

1:45 p. m.—Michael Daly, tenor.

p. m.—First series of "great artist" organ recitals; Chandler Goldthwaite.

ylrtuoso.

9 p. m.—Marguerite Behling, soprano.

9 p. m.—M. W. Konter, songs.

9:15 p. m.—R. W. Konter, songs.

9:30 p. m.—Marguerite Behling, soprano.

9:45 p. m.—R. W. Konter, songs.

10 p. m.—Radio talk.

10:15 p. m.—Kentucky Ramblers. WOR—NEWARK—405
6:45-7:15-7:45 a. m.—Gym class.
2:30 p. m.—Arthur McCormick. barytone
2:45 p. m.—Professor J. J. Santamarina
"South American Travelogue."
3 p. m.—Arthur McCormick, barytone.
3:15 p. m.—Madelaine Hulsizer, soprano
Brooke."
P. Adams, "Ruper'
3:45 or "Ruper'

Brooke."

45 p. m.—Madelaine Huisizer, sopran

15 p. m.—"Words Mispronounced."

17 p. m.—"Sports," Bill Wathey.

30 p. m.—"Man in the Moon Stories."

20 p. m.—Shelton dinner music.

20 p. m.—News bulletin.

WGCP—News bulletin.

WGCP—NEWARK—252
3 p. m.—Songs by artists.
4 p. m.—Songs,
6 p: m.—Orchestra.
6:45 p. m.—Dominion Orchestra.
7 p. m.—Dominion Orchestra.
8 p. m.—Perry Bradford entertainers.
8 p. m.—Studio program.
8:45-p. m.—Shirley Herman, singer.
9 p. m.—Ukulele Herman, singer. 11:30 a. m.—Columbia University lecture,
11:55 a. m.—Music.
12 noon—Market and weather reports.
4 p. m.—Sadie Zuckerman and Dora Gutentog, plano duets
4:15 p m.—Billy Rhodes, barytone.
4:30 p. m.—Plano duets.
4:45 p. m.—"The Disappearing Sturgeon"
6 p. m.—Dinner music,
7 p. m.—Gene Ingraham's Orchestra.
7:30 p. m.—Story teller.
7:45 p. m.—Vec Lawnhurst, planist. 9 p. m.—Shirley Herman, singer.
9 p. m.—Ukulele Bob McDonald.
9:15—Jimmy Flynn, songs.
9:30 p. m.—Eva Rothenberg, planologue.
10 p. m.—Strickland's Orchestra.
11 p. m.—Ritz Orchestra.
11:30 p. m.—Bob Murphy's Entertainers.
12 p. ni.—Connie's Orchestra.

WAAM NEWARK—263

1. a. m.—Happy hour.

1. 15 a. m.—Cooking school.

1. 15 a. m.—Happy hour.

1. 15 a. m.—Landon Mark, violinist.

1. 15 a. m.—Isadon Levine Trio. m —Isador Levine Trio. —Elizabeth Night. WFI-PHILADELPHIA-395

:30 a. m.—Solos.
:40 a. m.—Home service talk.
p. m.—Tea room ensemble.
p. m.—Recital.
p. m.—Fashion feature.
30 p. m.—Concert orchestra.
p. m.—Dance orchestra. WLIT—PHILADELPHIA—395 p. m.—Organ; concert orchestra, m.—Concert orchestra; playlet. m .- Dance musi -Dream Daddy. "Philadelphia Leads America

h.—Arcadia Dance Orchestra. m.—Rufus and Rastus." .—Popular program. WIP-PHILADELPHIA-508

WOO-PHILADELPHIA-\$08 p. m.—Grand organ; trumpets. p. m.—Dinner music. m.—R. C. O. Military Band. p. m.—Grand organ and artists cital. :30 p. m.—Elks string band. 10 p. m.—Musical program. 10:30 p. m.—Dance music.

10:30 p. m.—Dance music.

WCAU—PHILADELPHIA—278
7:45 p. m.—Delaware County Serenaders
8:15 p. m.—Chiropractic talk.
8:30 p. m.—Smoker entertainment.
9 p. m.—Instrumental trio.
9:30 p. m.—Billy's saxophone.
9:45 p. m.—Ed Kiefer, humorist.
10 p. m.—Rennie Cormack, songs.
10:30 p. m.—Loeser's Dance Orchestra.

WPG—ATLANTIC CRIW.

WPG—ATLANTIC CITY—300
p. m.—Organ recital.
n.—Trio dance music.
m.—"Educational Series." . m.—Studio program. ..—Ambassador Concert Orchestra WHAR-ATIANTIC CITY-275 30 p. m.—"Knowing Your Own City."

50 p. m.—Football forecast.

p. m.—Seaside Trio.

1:15 p. m.—Strand organ recital. WGY—SCHENECTADY—380 1740 p. m.—Stelmary Rice, violentst.
1330 p. m.—Stelmay series from WJZ.
10:30 p. m.—Comedy drama, "Smille Through."

WRW—TARRYTOWN, N. Y.—273 9:05 p. m.—Musical program; r test. 9:40 p. m.—Almo Entertainers.

9:40 p. m.—Almo Entertainers.
10:30 p. m.—Orchestra.
10:30 p. m.—Orchestra.
11:05 p. m.—Orchestra.
11:05 p. m.—Orchestra.
10:45 a. m.—Home Service falk.
6:30 p. m.—Dinner music.
9 p. m.—Winger's Entertainers.
9:30 p. m.—Wusical program.
10:30 p. m.—Something different.
11 p. m. 1 a. m.—Supper music.
WHAM—ROCHESTER, N. V.—278
3:30 p. m.—Eastman Theater Orchestra.
7 p. m.—Eastman Theater Orchestra.
7:30 p. m.—Eastman Theater Orchestra. 

Night.

WJAR—PROVIDENCE—306

10 a. m.—Housewives' Radio Exchange.
1:05 p. m.—Woodstock Entertainers.
8 p. m.—Musical program.
9 p. m.—Maine hour.
11 p. m.—Biltmore Dance Orchestra.

WCAC—MANSFIELD, CONN.—275

7:30 p. m.—Lecture on poultry.
7:45 p. m.—Program of music.

WEEL—BOSTON—349

6:45 a. m.—Health exercises.

WEEL-BOSTON-349 6
6:45 a. m.—Health exercises.
7:45 a. m.—Organ studio.
10:45 a. m.—Home Service talk.
3:15 p. m.—Art Rubin's Orchestra.
6:30 p. m.—Big Brother Club.
7:15 p. m.—Talk, E. E. Clive.
7:20 p. m.—Usost and found; weather,
7:20 p. m.—Neanoilian concert. p. m.—French elementary lessons.
m.—Advanced French lessons,
p. m.—Police alarms.
p. m.—Police alarms.
p. m.—Sesume of meeting of Boar
Estimate.
m.—Swiss Alpine singers and
lers.

1.020 p. m.—Books and Plays."
8 p. m.—Neapolitan concert.
8 p. m.—Musicale.
9 p. m.—Seapolitan concert.
9 p. m.—Musicale.

of Estimate.

8 p. m.—Swiss Alpine singers and yodders.

8 p. m.—Swiss Alpine singers and yodders.

8 p. m.—Recital-talk, by Herman Neuman, planist.

9:30 p. m.—Recital-talk, by Herman Neuman, planist.

9:40 p. m.—Colonial Dance Orchestra.

10:30 p. m.—Tea dance.

10:30 p. m.—Police alarms; weather.

10:30 p. m.—Colonial Dance Orchestra.

8 p. m.—Maximba Band and Orchestra.

10:30 p. m.—Maximba Band and Orchestra.

10:30 p. m.—Maximba Band and Orchestra.

10:30 p. m.—Arthur Reeve—"Fiction."

10:30 p. m.—Arthur Reeve—"Fiction."

10:30 p. m.—Arthur Reeve—"Fiction."

10:30 p. m.—Arthur Reeve—"Fiction."

10:30 p. m.—Tea dance.

4:20 p. m.—Ray Sinatra, planist.

6 p. m.—Kiddies' Club.

6:30 p. m.—Chiddren's perior of the stars.

10:30 p. m.—Maximba Band and Orchestra.

10:30 p. m.—Arthur Reeve—"Fiction."

10:30 p. m.—Motion picture review with the stars.

10:30 p. m.—Maximba Band and Orchestra.

10:30 p. m.—Arthur Reeve—"Fiction."

10:30 p. m.—Motion picture review with the stars.

10:30 p. m.—Motion picture review with the stars.

10:30 p. m.—Police alarms; weather.

8 p. m.—Chiddren's perior of the with the stars.

10:30 p. m.—Motion picture review with the stars.

10:30 p. m.—Bernstein Trio.

10:30 p. m.—Bernstein Trio.

10:30 p. m.—Bruthur Reeve—"Fiction."

10:30 p. m.—Children's perior of the stars.

10:30 p. m.—Children's perior of the stars.

10:30 p. m.—Motion picture review with the stars.

10:30 p. m.—Police alarms; weather.

10:30 p. m.—Police alarms; weather.

20:30 p. m.—Bernstein Trio.

20:30 p. m.—Children's perior of the stars.

20:30 p. m.—Bernstein Trio.

20:30 p. m.—Bernstein Trio.

20:30 p. m.—Police fol

WBZ-SPRINGFIELD, MASS.-333 WBZ—SPRINGFIELD, MASS.—5: 8:30 p. m.—Lenox Ensemble, 7 p. m.—Market reports, 7:15 p. m.—Organ recital, 8:15 p. m.—Soprano selections, 8:30 p. m.—Concert from Steinway

WTAG—WORCESTER—268
10:30 a. m.—Radio chat; "Food Hints."
12 noon-Market and weather report.
12:05-2 p. m.—Luncheon music.
7:15 p. m.—Story teller.
8 p. m.—Concert program. WRC-WASHINGTON-469
0 a. m --Women's hour from WJZ.
2 noon--Organ recital.
p. m.--Hamilton Orchestra.
p. m.--WRC's Foolish Entertainers.
p. m.--Book reviews. WCAP-WASHINGTON-489

WCAP—WASHINGTON—469
6:45-7:45 a. m.—Health exercises.
7:20-7:30 p. m.—Market summaries.
7:45-8 p. m.—"Form and Matter,"
Charles Monroe.
8 p. m.—Sophocles Papas's artists.
9 p. m.—Talk, "Boys."
9:15 p. m.—Wardman Park Trio.
10 n. m.—2 midnight—Dance music. m.-12 midnight—Dance music KDKA—PITTSBURGH—309

6:15 p. m.—Dinner concert.
7:30 p. m.—Daddy Winkum.
7:45 p. m.—Daddy Winkum.
8:30 p. m.—Musical program.
9 p. m.—Teaberry time.
WCAE—PITTSBURGH—461 6:30 p. m.—Dinner concert. 7:30 p. m.—Uncle Kaybee. 8 p. m.—Address. 3:30 p. m.—Concert.
WEAR—CLEVELAND—390

WADC—AKRON, OHIO—253 Studio concert.
WWJ—DETROIT—353 Orchestra and soloists. m.—Dance music.

WJR—PONTIAC, MICH.—517

m.—Goldkette's Orchestra; soloists.

m.—Musical program.

WREO—LANSING, MICH.—286

-Dinner concert
WQJ-CHICAGO-448 8 p. m.—Dinner concert.
11 p. m.—Rainbow Skylarks.
2 a. m.—The Ginger Hour.
WMAQ—CHICAGO—448
7 p. m.—Organ; League; Wide Awake 9 n.m.—Mr. and Mrs. Oberndorfer, 9:30 p.m.—Whitney Tric. 10 p.m.—University of Chicago, footbal

10 p. m.—University of Chicago conference. 10:20 p. m.—Elizabeth Stokes, soprano. 10:45 p. m.—Christian Endeavor Topics. WGN—CHICAGO—370 8:30 p. m.—Christian Sineavor Topics.

WGN—CHICAGO—370

8:30 p. m.—Dinner music.

10:30 p. m.—The Classic Hour.

12:30 a. m.—Dance music.

WHT—CHICAGO—400

7 p. m.—Classical program.

8:45 p. m.—Musical features (238 meters)

10:30 p. m.—Jelke Entertainers.

1a. m.—Your Hour League.

WOK—CHICAGO—217

11 p. m.—2 a. m.—Vocal and orchestra se lections.

WEBH—CHICAGO—370 WERH—CHICAGO—370
10 p. m.—Light Opera Company,
12-2 a. m.—Dance Orchestra; songs,
WLS—CHICAGO—345
7:15 p. m.-12 midnight — Organ; story
Rodeheaver program; farm talks; Apol
lo Club. lo Club.

KYW—CHICAGO—536

8 p. m.—Dinner concert.
9 p. m.—Musical program.
11 p. m.—Musical program.
12 a. m.—Midnight Revue.
13 a. m.—Minsompla Club."
WENR—CHICAGO—266
9-11 p. m.—Popular program.
1-3 a. m.—Midnight Frolic.
WOC—DAVENPORT—434
6:45 p. m.—Chime concert.
9 p. m.—Musical program.

SATURDAY

WEAF—NEW YORK CITY—492
6:45-7:45 a. m.—Health exercises.
1:45 p. m.—Harvard vs. Princeton football game described play by play.
4-5 p. m.—Elmer Grosso's Orchestra.
6 p. m.—Elmer Grosso's Orchestra.
7 p. m.—The Adelphians.
7:10 p. m.—Dora Pardee, cornetiste.
7:20 p. m.—The Adelphians.
7:35 p. m.—Vera Eskin, planiste.
7:45 p. m.—Louis Zeidler, tenor.
8 p. m.—Making America Safer."
8:10 p. m.—Boss Gorman's Orchestra.
8:45 p. m.—Vera Eskin, planiste.
8:55 p. m.—'Jury Duty," Judge Marks.
9:10 p. m.—Glist Opera Quartet.
9:40 p. m.—Oliver Anderson, cellist.
9:20 p. m.—Light Opera Quartet.
10:20 p. m.—Light Opera Quartet.
10:20 p. m.—Milton Rettenberg, planist.
10:30 p. m.—Milton Rettenberg, planist.
11 p. m.-12 midnight—Vincent Lopez's Dance Orchestra.

WJZ—NEW YORK CITY—456 WEAF-NEW YORK CITY-492

WJZ-NEW YORK CITY-455 1:15 p. m.-Knickerbocker Orchestra 2, 6, 7:30 and 7:55 p. m.-News servic 2:15 p. m.-Football game, Harvard Princeton. 2:15 p. m.—Football game, Harvard va Princeton,
5 p. m.—Lorraine Dance Orchestra.
6:02 p. m.—Market quotations.
6:20 p. m.—Farancial summary.
7 p. m.—Levitow's Dinner Orchestra.
8 p. m.—Football scores,
8:10 p. m.—The Texans, popular songs.
8:30 p. m.—Sherry's Dance Orchestra.
9 p. m.—Gertrude Hopkins, harpist.
9:15 p. m.—To be announced.
9:30 p. m.—Gertrude Hopkins, harpist.
9:45 p. m.—To be announced.
11 p. m.—Jacques Green's Orchestra,
with Clark's Hawalians.
WGBS—NEW YORK GUTY.

WGBS-NEW YORK CITY-316 m.—Timely talks with Terese.

a. m.—Kiddie Klub.

a. m.—Frank Medviczky, 1 ittauer, pianists. 0 a. m.—Fashion talk.

Littauer, pianists.

0:50 a. m.—Fashion talk.

330 p. m.—Scripture reading.

330 p. m.—Scripture reading.

330 p. m.—Emil Fanning, barytone.

p. m.—Hor View With Mrs. John Pratt

10 p. m.—Jon Dunbar, tenor.

10 p. m.—Jon Dunbar, tenor.

10 p. m.—Jon Dunbar, tenor.

11 p. m.—Jon Dunbar, tenor.

12 p. m.—Jon Dunbar, tenor.

13 p. m.—Uncle Geebee.

13 p. m.—Uncle Geebee.

13 p. m.—V. Sorey's Concert Trie.

14 p. m.—To be announced.

15 p. m.—Lone instructions.

15 p. m.—Charlotte Treadwell, soprano.

14 p. m.—Two Hot Knights.

15 p. m.—Klitle Band.

15 p. m.—Klitle Band.

15 p. m.—Magyar Ensemble; Gaspar

15 p. m.—Magyar Ensemble; Gaspar

10 sano, tenor.

10 p. m.—Magyar Theater program.

10 sano, tenor.

10 so p. m.—Marrowhead Orchestra.

10 m.—New YORK CITY—259

WRNY—NEW YORK CITY—259
1:30 a. m.—News flashes.
10:30 a. m.—Reducing exercises,
10:45 a. m.—Women's hour. 10:45 a. m.—Neducing exercises,
10:45 a. m.—Neducing exercises,
12 noon—Hour of music,
2:30 p. m.—Radio matinee, "Purple
Peacock," Fique and full cast,
4:15 p. m.—Afternoon program,
4:30 p. m.—Symphony Society,
4:45 p. m.—Rita's kiddie music party,
7 p. m.—"Whose Birthday To-day?"
7:05 p. m.—Telegraph sport flash,
7:15 p. m.—Commerce of the day,
7:20 p. m.—John Martin, "fairy tales,"
7:35 p. m.—Dental series,
7:45 p. m.—Rosevelt Concert Orchestra,
8:15 p. m.—Charles Haubiel, planist,
8:30 p. m.—Ben Bernie's Orchestra,
9:15 p. m.—Players—"Three Fools There
Were,"
9:30 p. m.—Bernstein Trio.

WMCA-NEW YORK CITY-341 6 p. m.—Olcott Vail's String Ensemble. 6:30 p. m.—Milton Newmeyer, talk. 6:40 p. m.—Violet Kayo, "The Happy Girl."
7:45 p. m.—Anna Daly, violinist; William

Bonner, barytone.

830 p. m.—Robert S. Chree, barytone.

9 p. m.—Julius Steiner, tenor.

9:30 p. m.—Kathryn M. Hegeman, se-

WNYC-NEW YORK CITY-526 WNYC-NEW YORK CITY-026
7 p. m.—Dinner music.
7:30 p. m.—Police alarms.
7:35 p. m.—St. George Orchestra.
8 p. m.—Football results.
8:05 p. m.—Max Wechsler, violinist.
8:05 p. m.—Emily Avery Concert.
9:30 n. m.—Emily Avery Concert.
9:30 n. m.—Folice Quartet.
9:35 p. m.—Emma May, soprano.
10:10 p. m.—Police alarms; weather.
10:35 p. m.—Emma May, soprano. WFBH-NEW YORK CITY-273

2-5 p. m.—N. Y. U. football game. 5 p. m.—Emma Kneiles, songs. 5:15 p. m.—Bob Schafer, Fred Fisher. 5:15 p. m.—Bob Schafer, Fred Fisher, songs.
5:45 p. m.—Marjorie Wall, soprano.
6 p. m.—Southern Serenaders' Orchestra,
6:30 p. m.—Yorkville Radio Trio.
7 p. m.—Hock and Jerome, songs.
7:15 p. m.—Arthur Kraus's Orchestra.
WOKO—NEW YORK CITY—233
8 p. m.—Gertrude Seidermaa, pianist.
8:15 p. m.—Elizabeth Blaurock, soprano.
8:35 p. m.—Elizabeth Blaurock, soprano.
8:35 p. m.—Gentrude Seidermaa, pianist.
9:05 p. m.—Isabeth Henderson, soprano.
WBBR—STATEN ISLAND, N. Y.—273
8 p. m.—Profesor Rohner, violinist.
8:10 p. m.—Fred Twaroschk, tenor.
swers.

40 p. m.—Fred Twaroschk, tenor.

12 noon—Musical program.

WOR—NEWARK—405
6:45-7:15-7:45 a. m.—Gym class.
2:30 p. m.—Mario Alverez, entertainer.
2:45 p. m.—Walter S. Ansbro, barytone.
3 p. m.—Mario Alverez, entertainer.
3:15 p. m.—Words Mispronounced."
6:15 p. m.—"Words Mispronounced."
6:17 p. m.—"Sports." Bill Wathey.
6:30 p. m.—Shelton dinner music.
7:30 p. m.—Van's Collegians.
8 p. m.—Van's Collegians.
8 p. m.—A. Baecht, violinist.
8:15 p. m.—Shirley Vernon, pianist.
8:45 p. m.—Soprano.
8:30 p. m.—Arthur Baecht, violinist.
9 p. m.—Orchestra.
10 p. m.—Wows bulletin.
10:10 p. m.—Hour of song.
11 p. m.—Eddie Elkins's Orchestra.
WGCP—NEWARK—252

MGCP—NEWARK—252

3 p. m.—Henry Rogers, planist.
3:15 p. m.—Songs.
3:50 p. m.—Ukulele Lou Hayes.
3:45 p. m.—Rust and Henricksen, ban-joists.
4 p. m.—Johanna Cohen, songs.
4:15 p. m.—Richard Cheatham's Band.

4:15 p. m.—Richard Cheatham's Band
2:30-4:30 p. m.—Football game.
6:30 p. m.—Joe Chickene's Orchestra.
7 p. m.—Walter Cobb, planist
7:10 p. m.—Walter Cobb, planist
7:10 p. m.—Walter Cobb, planist
7:25 p. m.—Walter Cobb, planist.
7:30 p. m.—Al Pfater's Orchestra.
8 p. m.—Jolly Bill Tveinke.
8:15 p. m.—Andrew Hayes, tenor.
8:35 p. m.—Bloomfield Ridge Boys.
9 p. m.—Samuel Silverberg, reader,
9:20 p. m.—Hilda Kay, contraito.
9:40 p. m.—Bloomfield Ridge Boys.
10 p. m.—Hartley Joy Boys.
WOO—PHILADELPHIA—508

10 p. m.—Biodimiral Rings Boys,
WOO—PHILADELPHIA—508
11 a. m.—Grand organ;
12 noon—Luncheon music,
4:45 p. m.—Grand organ; trumpets,
7:30 p. m.—Dinner music,
WIP—PHILADELPHIA—508
6:45 a. m.—Setting.up averclies

6:45 a. m.—Setting-up exercises.
10:30 a. m.—Reducing exercises.
1 p. m.—Organ recital.
3 p. m.—Football game between Unlversity of Pennsylvania and Haverford College.
6:05 p. m.—Dinner music.
7 p. m.—Bedtime story and roll call.
8 p. m.—"Environment." Louis Gerschenfeld.
8:15 p. m.—Opera surprise program.
10:05 p. m.—Opera surprise program.
10:05 p. m.—Dance music.
WFI—PHIS ADELPHIA—305.
1 p. m.—Tea roots ansemble; Harvard vs.

WII-PHII-ADELPHIA-395

p. m.—Tea roots ensemble; Harvard vs.
Princeton.
6:30 p. m.—Cencert orchestra.
7 p. m.—Dance orchestra.
8:20 p. m.—New York Philharmonic Orchestra. Orchestra. WLIT—PHILADELPRIA—395

12:05 p. m.—Organ recital.
12:30 p. m.—Concert orchestra.
4:30 p. m.—Jance music.
7:30 p. m.—Jimmy Jones's Orchestra.
WPG—ATLANTIC CITY—300 1:30 p. m.—Luncheon music.
6:45 p. m.—Organ recital.
7 p. m.—Traymore dinner music.
8 p. m.—To be announced. WHAR—ATLANTIC CITY—275

. m .-- Lecture period. WRW—TARRYTOWN, N. Y.—273
05 p. m.—Musical program.
40 p. m.—Albert West, songs.
105 p. m.—Gordon Hastings, flute.
120 p. m.—Frank Watson, planist.
140 p. m.—Dance Orchestra.
155 p. m.—Hastings and Watson.

11:15 p. m.—Dance orchestra.

WGR—BUFFALO—319 Meters, 750 Watts
1:45 p. m.—Intercollegiate football game
—Harvard vs. Princeton.

WMAK—LOCKFORT N. Y.—266

0-10 n. m.—The Clif Trio.

WHAM—ROCHESTER, N. Y.—278
3:30 p. m.—Eastman Theater Orchestr
5 p. m.—Theater organ.
7 p. m.—Eastman Theater Orchestra.
7:30 p. m.—Football scores; weather.
WTIC—HARTFORD—476 1:43 p. m.—Harvard-Princeton football WJAR—PROVIDENCE—306 1:45 p. m.—Harvard-Princeton game. 8:20 p. m.—Philharmonic Orchestra. WEEL—BOSTON—349

WEEL—BOSTON—349
6:45 a. m.—Health exercises.
7:45 a. m.—Organ Studio.
8 p. m.—Dok Eisenbourg's Orchestra.
9 p. m.—Dok Eisenbourg's Orchestra.
10 p. m.—Pand and orchestra.
WNAC—BOSTON—230 WNAC—BOSTON—280

1 p. m.—Luncheon orchestra,

1:15 p. m.—Bernard Eyges's program,

4 p. m.—Copley Plaza tea dance.

6 p. m.—New Radio Club.

6:30 p. m.—Dinner dance.

8 p. m.—Concert program.

9:30 p. m.—Dance music.

WHZ—SPRINGITIELD, MASS.—333

3 p. m.—Play-by-play broadcast of Har-

10:30 a. m.—Miscellancous prgram. 12 p. m.—Produce market report. 1:45 p. m.—Harvard vs. Princeton. 5:15 p. m.—"Story Teller". WRC—WASHINGTON—469 WRC-WASHINGTON-469

I p. m.—New Willard Orchestra.

7 p. m.—Washington Orchestra.

8 p. m.—Bible talk,

8:15 p. m.—Musical program.

10:30 p. m.—"Crandal's Saturday Nighters.

12 midnight—Shoreham Orchestra.

WCAP—WASHINGTON-469

6:45-7:45 a. m.—"Health Exercises."

1:45 p. m.—Harvard vs. Princeton football game.

EUKA—PITTSRIFGH—200

game. KDKA—PITTSBURGH—309 KDKA—PITTSBURGH—309
6:15 p. m.—Children's period.
6:30 p. m.—Dinner concert.
7:30 p. m.—Children's period.
8:30 p. m.—Westinghouse Band.
WCAE—PITTSBURGH—461

A Series of Miniature Musical | lies" and the "Greenwich Village Fol- | N. Y. Symphony Orchestra | Scherzo, Molto vivace, and Allegro Comedies Directed by G. Rice lies." The music is composed by Lieutenant Gitz Rice and the scenery The "Goodrich Zippers," under the by "your own imagination."

direction of Lieutenant Gitz Rice, The cast to take part in this first make their debut from WEAF and York time, Thursday evening, when Hoffman and others. An orchestra, Around the World." The name of It will be broadcast by the Silverthe first comedy is "Cupid and the Cop," a whirling romance of Fifth Avenue and Forty-second Street, New WFI, WCAE, WJAR, WADC and York City. The book is by George WTAG. V. Hobart, well known through his stage adaptations of "Experience," "Sunny," "Buddies" and many

sketches in Florenz Ziegfeld's "Fol- when connected in series parallel. Adagio, allegro Molto; Largo; operated from a pushcart.

The much heralded opening concert of the New York Symphony Orches- Federation of Churches. program includes John Meyer, Al- tra in the new Mecca Auditorium, The Symphony Society of New York set is in good condition, ready to rea chain of stations at 10 o'clock, New bert Campbell, Frank Croxton, Ruby New York City, this afternoon, at is entering its forty-eighth season 3 o'clock will be broadcast by WEAF. and the forty-first under the capable under the direction of Joseph Knecht, Walter Damrosch, the conductor of direction of Walter Damrosch, who of original intimate miniature weekly under the direction of Joseph Knecht, who musical comedies entitled "A Whirl will supply light popular music be will supply light popular music be will supply light popular music be will lead the orchestra in New York, will lead the orchestra in New York, assumed the responsibility of the fore, during and after "the show." will lead the orchestra in New York's organization as a youth of twentylargest concert hall, whose seating three upon the death of his father, capacity is more than four thousand. Dr. Leopold Damrosch. In the concert which opens the 1925-'26 season the program to be broadcast will consist of the four movements of the "Symphony in E Minor" known as the "New World mits the customer to clamp on a If you cannot test your batteries,

Opens in Mecca Auditorium con fusco. This music will replace the usual services held under the auspices of the greater New York

German Radio Peddlers The radio peddler in Berlin per-

The life of batteries is lengthened Symphony," by Dvorak, namely; head-set from his portable radio,

Test Batteries Now Now that the winter radio season

s here it is time to see that everything concerned with your receiving ceive the wonderful programs. One of the first things to do is to have your batteries tested. This test should be made with a voltmeter, while the tubes are turned on. If dry-cell A batteries are used, each cell should test at least 1.1 volts. A 221/2-volt dry B battery should test at least 17 volts, and a 45-volt dry B pattery should test at least 34 volts. they should be taken to a dealer who is equipped to give this service.

The Radio Salon. Third Floor. Open Evenings until-9 P. M.

For this sale Evening Entrance 166 East 60th Street BloomingdaleS

The most beautifully appointed Radio Salon in the citylight and airy, roomy and spacious with courteous and well informed people ready to serve you always.

## We've GOT Them-3 New Carloads-

Just when they're wanted most!

### 420 FRESHMAN-MASTERPIECE HIGHBOY RADIO

The biggest thing that ever happened in Radio and here's why!—

(1) The finest set Freshman has made, built by them into this beautiful mahogany finished highboy cabinet, 42 inches

(2) Scientifically constructed built-in speaker with full fashioned wood throat.

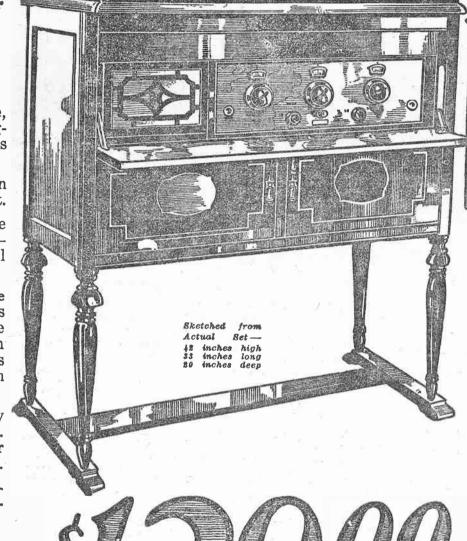
(3) Everything contained inside the cabinet — batteries, tubes, speakers — EVERYTHING-no unsightly external parts.

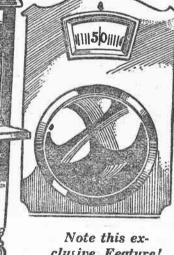
(4) The New Wonderful Peephole speedometer type dials one of which is pictured at right hand side of above illustration. This dial has a very high ratio vernier arrangement and shows only a small portion of the wave length band at one time.

(5) We have sold hundreds of the very same set without the cabinet for \$97.89. This means we are adding only \$31 for a beautiful cabinet that is worth far more.

All made by Freshman—not an assembled set in a cheap cabinet—but a complete high class Freshman unit.

with all accessoriesnothing else to buy! all ready to install—





clusive Feature!

Above is shown a "close-up" of the new speedometer type dials—a wonderful new radio feature with a high ratio vernier ar-

A boon for the ladies!

All tubes and batteries out of sight in this beautiful hogany finished cabinet-see the wonderful builtin speaker!

Weekly May Be

Arranged

### Read the Amazing Story Behind This Sale!

This sale was planned months ago . . . when Charles Freshman Company conceived this wonderful new radio highboy. We gave them the very first order for three carloads.

Despite the fact that the Freshman Company is among the very largest of radio makers, they were taxed above capacity in turning out cabinets for their regular small size table type radio receivers. Meanwhile they delivered to us several samples of

these highboy models From these samples we have taken orders for over one hundred of these outfits.

They made such a hit with the public that our customers were willing to wait and they are only now being delivered.

For months and months the public has tried to get these Highboys, but no dealer has had any quantity of them. As our orders were in months before anyone else's we believe that it will be some time before they will be obtainable elsewhere—except on future delivery from samples and even then at prices higher than

We now have about three hundred available for immediate delivery after filling our back orders, and they should go in short order.

Radio Salon Open Every Evening Till 9

Evening Entrance 166 East 60th St.

Highest Grade Accessories go with each Freshman Highboy!

Low as

Genuine Cunningham C-301-A tubes. one hundred ampere hour Westinghouse Storage Battery in rubber

large size 45-volt B Batteries—made by a famous B Battery maker.

1 battery cable to make all connections. 1 complete antenna equipment, and

Six Months FREE Service on

every set installed by us!

## The Herald Tribune Daily Broadcasting Programs for Week Ending November 7

#### TO-DAY

WEAF-NEW YORK CITY-492 m.— Sunday Hymn Sing." m.—Concert by New York Symphony Society.

p. m.—Concert by New York Symphony Society.

p. m.—Men's Conference at the Y. M. C. A.; address by Dr. S. Parkes Cadman; Gloria Trumpeters.

7:20-9:15 p. m.—Musical program.

2:15-10:15 p. m.—"Atwater Kent Hour,"
Mary Lewis, soprano; Paul Kochanski, violinist

9 a. m.—Children's Hour: Stories, n comic stories. 11 a m.—West End Presbyterian Churce services.

12:30 p. m.—Sunday Radio Forum.

2:30 p. m.—Sunday Radio Forum.

3:30 p. m.—Lillian Popper, planist.

4 p. m.—St. George Episcopal Church Vesper Services; George Kemmer, organist; Mozelle Bennett, violinist; Rebeca Pharo, soprano; George Bagdasarian, tenor. 5:45 p. m.—"The Radio of Spirit," Edgar

Burtell.
7 p. m.—Carillon from Park Avenue Baptist Church.
7:30 p. m.—Nathan Abas's Orchestra.
8 p. m.—John Amous, flutist.
8:45 p. m.—Gertrude Hopkins, harpist.
9 p. m.—Irva Giles, soprano.
9:30 p. m.—Gertrude Hopkins, harpist.
9:45 p. m.—Gertrude Hopkins, harpist.
9:45 p. m.—Gertrude Hopkins, harpist.
9:45 p. m.—Metropolitan Brass Quartet.
10 p. m.—Godfrey Ludlow. violinist. WJY—NEW YORK CITY—405 8:15 p. m.—Commodore Concert Orch. WGBS\_NEW YORK CITY\_316 3:30 p. m.—Program from Warner's Thea-

107.

9:30 p. m.—Woodwind Ensemble.

9:50 p. m.—Howard's Masonic Quartet.

10 p. m.—"Transients in Arcadia," an Henry story dramatized.

10:10 p. m.—Woodwind Ensemble.

10:20 p. m.—Howard's Masonic Quartet.

10:30 p. m.—Woodwind Ensemble.

WHN—NEW YORK CITY—361 1 p. m.—Organ recital. 2:30-3:30 p. m.—Christian Endeavor pro

gram.

5 p. m.—Roseland dance orchestra.

7:30-10 p. m.—Church service.

10:45 p. m.—Janssen's orchestra.

12 a. n.—Richman entertainer. WMCA-NEW YORK CITY-341 WMCA—NEW YORK CITY—341
a. m.—Christian Science services.
p. m.—Cosmopolitan Trio.
m.—Roomer's Homers.
m.—Ernie Golden's orchestra.
p. m.—Olcott Vail's string ensemb
WYNC—NEW YORK CITY—526

p. m.—Dinner and entertainment Pleiades Club, Murray Hulbert pre-ing; speakers and entertainers. WRNY—NEW YORK CITY—259
2:45 p. m.—Body fit talks.
3 p. m.—Wusic of All Religions.
3:45 p. m.—Bible reading to music.
4 p. m.—Dr. Christian Reisner's hour.
5 p. m.—Becker string quartet.
3:15 p. m.—Charles D. Isaacson's conce WFBH—NEW YORK CITY—273
5 p. m.—Artillery Band.
6 p. m.—Masonic news.
6:15 p. m.—Garibaldi Arrighi singers.
6:30 p. m.—Eossert Lumberjacks.
7:05 p. m.—Everglades orchestra.
7:35 p. m.—Franklin Four. WLWL—NEW YORK CITY—288 p. m.—Paulist Choristrs; srmon by Rev. J. M. Gillis; benediction.

tower orchestra.

p. m.—Choral singers.

p. so. m.—Volin choir.

15 p. m.—Bible lecture, Judge Rutherford. 9:50 p. m.—Choral singer, violin choir,

singers. WGBB—FREEPORT—244 10;40 a. m.—Church services.

WGCP—NEWARK—252
8 p. m.—Charlotte Trystmann, planist,
8:15 p. m.—Rosencranz's Orchestra.
9:15 p. m.—Milton Yokeman, tenor,
9:30 p. m.—Sylvia Schatz, planist,
9:45 p. m.—Isabelle Henderson, soprano,
10 p. m.—Frank Kaltman, violinist,
10:15 p. m.—Strickland's Orchestra.

WFI—PHILADELPHIA—395
10:20 a. m.—Services.

WFI—PHILADELPHIA—558

0:20 a. m.—Services.
6:30 p. m.—Chapel service.
2:30 p. m.—Musical exercises opening the Bethany Sunday School.
6 p. m.—Sacred recital.
7:45 p. m.—Evening services.
9:15 p. m.—Mary Lewis, soprano; Paul Kochanski, violinist.
WIP—PHILADELPHIA—508

10:45 a. m.—Morning service.
3 p. m.—Anna Greenspan, Pianist.
3:20 p. m.—Interview with Elinor Mish.
3:30 p. m.—Anna Greenspan, Pianist.
3:40 p. m.—Talk, Mrs. F. Louis Slade.
3:50 p. m.—Anna Greenspan, pianist.
3:50 p. m.—Interview with Harrieti stock.
3:10 p. m.—Anna Greenspan, Pianist.
3:50 p. m.—Interview with Harrieti stock.
3:10 p. m.—Anna Greenspan, Pianist.
3:50 p. m.—Interview with Harrieti stock.
3:10 p. m.—Interview with

10:45 a. m.—Morning service.
2:15 p. m.—Short sacred recital.
2:45 p. m.—Sermon, Rev. H. E. A. Durell.
7:50 p. m.—Evening service.
9 p. m.—Seaside Trio.
11:15 p. m.—Strand organ recital.
WCAU—PHILADELPHIA—278

w.A.U.—FRILABLETHIA—278
m.—Robert Fraser, singer.
p. m.—Radio Church service.
p. m.—Recital.
p. m.—"By the Way," Rev. John tockwell.
m.—Pennsylvania Concert Orchestra.
WPG—ATLANTIC CITY—300

3:15 p. m.—Organ recital.
4:15 p. m.—Vocal and instrumental recital.
9 p. m.—Ambassador Concert Orchestra.
10 p. m.—Organ recital.
WGY—SCHENECTADY—380 10:30 a. m.—Service. 12:30 p. m.—Program from WJZ. 7:45 p m.—Service.

m.—Program from WJZ. WRW—TARRYTOWN, N. Y.—273 8:05 p. m.—Services. 10:30 p. m.—Musical program. 11:05 p. m.—Dance orchestra. WGR—BUFFALO—319

WGB—BUFFALO—319
3 p. m.—Vesper services.
7:45 p. m.—Evening service.
9:15 p. m.—Atwater Kent artists.
10:30 a. m.—Church service.
2:30 p. m.—Church service.
7:30 p. m.—Church service. 7:30 p. m.—Church service. WHAM—ROCHESTER, N. Y.—278 WHAM—BOCHESTER, N. Y.—
8:15 p. m.—Radio Chapel service,
WNAC—BOSTON—280
10:53 a. m.—Morning service,
1:30 p. m.—Concert.
8:15 p. m.—Old South Meeting

7:20 p. m.—Evening service.
WEEL-BOSTON—349 WEEI-bOSTON-349
4 p. m.—Men's conference.
7:20 p. m.—Capitol Theater Family.
9:45 p. m.—Atwater-Kent hour.
WJAR-PROVIDENCE-306
7:20 p. m.—Capitol Theater Family.
9:15 p. m.—Atwater-Kent hour.
WBZ—SPRINGFIELD, MASS.—333

10:55 a. m.—Church services. 8 p. m.—"Is Life Worth Living?" by James J. Walsh.

James J. Walsh.

WTAG—WORCESTER, MASS.—268

p. m.—Program from WEAF.

7:20-10:15 p. m.—Program same
WEAF.

WCAP—WASHINGTON—469 11 a. m.—Service. 4 p. m.—Service at Bethlehem Chapel. 7 p. m.—Addresses by Donald B. Mac

Millan. 7:20-9:15 p. m.—Capitol Theater Family. 9:15-10:15 p. m.—Atwater-Kent hour. KDKA—PITTSBURGH—309

KDRA—PITTSBURGH—309

10:45 a. m.—Church service,
4 p. m.—Organ recital.
4:45 p. m.—Vesper services,
6:30 p. m.—Dinner-concert,
7:45 p. m.—Church service,
WCAE—PITTSBURGH—461

4 p. m.—Dr. S. P. Cadman, from York,
7:20 p. m.—Contiel Theater Familia 7:20 p. m.—Capitol Theater Family. 9:15 p. m.—Atwater-Kent hour.

m.—Dinner music.
WEAR—CLEVELAND—390

.—Services.
.—Orchestra and soloists.
WKRC—CINCINNATI—326 8:30 p. m.—Radio frolic, WSAI—CINCINNATI—326 4 p. m.—Program from WEAF. 8:45 p. m.—Chime concert; sermor 9:15 p. m.—Program from WEAF

7:25 p. m.—Capitol Theater Family. WREO—LANSING—286 p. m.—Church service, KYW—CHICAGO—536

WCBD—ZION CITY—345 9 p. m.—Hire String Quartet and WHT—CHICAGO—400 7:30 p. m.—Tabernacle band and choir. 16:30 p. m.—Request program. 11:30 p. m.—Back home hour. 7:30-9:30 p. m.—Concert and dance musi 2 a. m.—Musical program. WQJ—CHICAGO—448. 9-11 p. m.—Ralnbow Orchestra: artists. 9-11 p. m.—Rainbow Orchestra; artists. WENR—CHICAGO—266

10:30 p. m.—Popular program. WOC—DAVENPORT—484 7:30 p. m.—Church service.
9:15 p. m.—Program from WEAF. 10:15 p. m.—Familiar hymns. KFMX—NORTHFIELD, MINN.—337 -College vesper service. WCCO-ST. PAUL-416 m -- Program from WEAF. 9:15 p. m.—Program from WEAF, KTHS—HOT SPRINGS—375

10 p. m.—Orchestra. 11 p. m.—Singing orchestra. WOAW—OMAHA—526 10 p. m.—Evening chapel s MONDAY

WJZ—NEW YORK CITY—455

10 a. m.—Women's hour.
11:00 a. m.—News Service.
1:00 p. m.—Meyer Davis's Orchestra.
2. 4. 5:30, 8 and 11 p. m.—News Service.
4:03 p. m.—Carolyn Springer, contralto.
5:30 p. m.—Market reports.
5:30 p. m.—Market reports.
5:30 p. m.—Financial summary.
6:30 p. m.—N. Y. University Course.
"Problems of Knowledge or Just Think,"
Prof. Chas. Gray Shaw.
7 p. m.—Bernhard Levitow's Dinner Concert.
8:35 p. m.—Honest Ballot Association.
5:30 p. m.—Program from Steinway Hall;
Orchestra: Ernest Hutcheson, pianist.

Orchestra; Ernest Hutcheson, piani op. m.—Revelers. p. m.—Joseph Knecht's Orchestra. 11 p. m.—Hevelers.
11 p. m.—Joseph Knecht's Orchestra.

WEAF—NEW YORK CITY—492
6:45-7:45 a. m.—Health exercises.
10:45 a. m.—Home service talk.
11:05 a. m.—Couming Fashions.
11:15 a. m.—'Coming Fashions.'
11:30 a. m.—Columbia University lecture:
Talk to mothers on care of infants.
12 noon—Market and weather reports.
12:30 p. m.—Government Club meeting:
"Problems of America as Seen From
Europe," Abbe Dimnet; "Education,"
Dr. James J. Walsh.
4:30 p. m.—Paul E. Butler, barytone.
4:45 p. m.—"A Merry Menagerie," with
plano accompaniment.
6 p. m.—Dinner music.
7 p. m.—Ivy Scott, soprano.
7:30 p. m.—Josef Geiger, recital.
7:30 p. m.—Josef Geiger, recital.
7:45 p. m.—J. Derwin, banjoist,
8 p. m.—Your Hour.
8:30 p. m.—Your Hour.
8:30 p. m.—Tourse Hushes minutes.

8 p. m.—J. J. Derwin, banjoist,
8 p. m.—Your Hour.
8:30 p. m.—Thomas Hughes, planist.
8:45 p. m.—Health Talk.
9 p. m.—Music by Gypsies.
10 p. m.—Grand Opera, "La Gloconda."
11-12 p. m.—Ben Bernie's Orchestra.

WGBS—NEW YORK CITY—316
10 a. m.—Timely Talks with Tereso.
10:10 a. m.—Jack Cohen, Pianist.
10:20 a. m.—Household Economy; piano.
10:40 a. m.—Fashion Talk; piano.
1:30 p. m.—Scripture Reading.
1:35 p. m.—Apollo Symphony Orchestra.
3 p. m.—Interview with Harriett Comstock.

2:15 p. m.—Evelyn Ryan, pianist,
2:30 p. m.—Joe Sherman, songs,
2:45 p. m.—Mme. Cecelia Rivero, soprano.
2:55 p. m.—Miriam Gordon, recitations,
3:05 p. m.—'Yama Yama Boys,''
3:46 p. m.—'Ernest Cafiso, pianist,
4 p. m.—Haines and Scott,
4:16 p. m.—Betty Nemerson, Ida Wyscoki,
duets,

duets.

4:30 p. m.—Old time songs.

4:30 p. m.—Betty Lee, songs.

4:30 p. m.—Harry Stone's Syncopa

6:30 p. m.—Leslie McLeod, tenor.

6:40 p. m.—Sunshine talk.

7:50 p. m.—Swanee Orchestra.

8:15 p. m.—'Storage Battery.

8:15 p. m.— Section
Shontz.
8:20 p. m.—Dance orchestra.
8:50 p. m.—Judith Roth, soprano.
9 p. m.—Guardian Entertainers.
9:30 p. m.—Billy Wynne's Orchestra.
11 p. m.—Cotton Orchestra.
11:30 p. m.—Revue and orchestra.
12 p. m.—Ted Lewis's Orchestra. WMCA-NEW YORK CITY-341

i-6 p. m.—Candidates Hour from Water-man's headquarters. Addresses by Jo-seph Levensen, Frank D. Waterman, Charles S. Whitman and John R. Davies;

music.
6 p. m.—Olcott Vail's String Ensemble.
6:30 p. m.—Ernie Golden's Orchestra.
7:30 p. m.—Lullaby music.
8 p. m.—Edward Fronch, pianist; Neiman Weinstine, violinist.
8:30 p. m.—Lillian Jesso, soprano.
9 p. m.—Lecture on Christian Science.
10:15 p. m.—Radio Entertainers.
11:15 p. m.—Cherry Lane players.
WNYC—NEW YORK CITY—526
11 a. m.—"Decorative Floors"

WNYC-NEW YORK CITY-526

11 a. m.—'Decorative Floors."

11:15 a. m.—Morning concert.

11:145 a. m.—Joe Schmitt's recipes.

12 noon—Concert.

6:10 p. m.—Harket high spots.

6:20 p. m.—Plano selections.

6:30 p. m.—Elementary German lessons.

7 p. m.—Advanced German lessons.

7:35 p. m.—The Bensonians.

8 p. m.—Valter Scott, violinist.

8:20 p. m.—Walter Scott, violinist.

8:20 p. m.—Walter Scott, violinist.

8:30 p. m.—Walter Scott, violinist.

8:40 p. m.—Lillian and Helen Brandt, solos.

8:50 p. m.—Lillian and Helen Brandt, p. m.—The Pyramid Entertainers

9 p. m.—The Fyramid Entertainers, 9:30 p. m.—Marie Hechman, soprano, 9:50 p. m.—Leo Lynch, tenor. 10 p. m.—Leo Lynch, tenor. 10:10 p. m.—Talk by Francis I. Ketc 10:30 p. m.—Police alarms, 10:35 p. m.—St. George Orchestra. 10:35 p. m.—St. George Orchestra.

WFBH—NEW YORK CITY—273

2 p. m.—Tommy Lorraine's Orchestra.

3 p. m.—Arthur Kraus's Orchestra.

445 p. m.—Lou Lockett, violinist.

45 p. m.—Katherine Work, planiste.

445 p. m.—Kraus's Orchestra.

5 p. m.—Kraus's Orchestra.

5 p. m.—Kraus's Orchestra.

5 p. m.—Baj Masque Orchestra. WHAP-BROOKLYN, N. Y .-- 240

-Studio program. WLW-CINCINNATI-422

WRNY—NEW YORK CITY—259
9:30 a. m.—News headlines,
10:30 a. m.—Reducing exercises,
10:45 a. m.—Six new books,
11 a. m.—"Interior Decorating,"
11:15 a. m.—"Musical Courier" says—
12 noon—Hour of music,
4:15 p. m.—"Radio Reminiscences,"
4:30 p. m.—Bill Rietz, songs,
4:45 p. m.—Dr. Daniel Goolwill, songs,
6:30 p. m.—Jimmy Lent's Orchestra

133 p. m.—Mrs. Ruth Pratt, geography.
1550 p. m.—Kathryn Behnke, the lullaby
lady,
8 p. m.—Ferrucci's Orchestra.
8:10 p. m.—Painting series.
8:40 p. m.—Fainting series.
8:40 p. m.—Ferrucci's Orchestra.
8:45 p. m.—Jazzing Egyptian Ballet.
9 p. m.—'How Science Affects Our Lives.'
9:15 p. m.—Music travelogue.
9:15 p. m.—Hulis Sper, planiste.
10 p. m.—Poetry post.
10:20 p. m.—Popular songs.
10:30 p. m.—Louise Rice, graphologist.
10:45 p. m.—Emma May, soprano.
11:15 p. m.—Emma May, soprano.
11:15 p. m.—Radio Theater Players
"Bought and Pald For"

WOKO—NEW YORK CITY—233

WRNY-NEW YORK CITY-258

WORO—NEW YORK CITY—233 15 p. m.—Anna Diamond, pianiste. 35 p. m.—Anthony Tassio, guitar. p. m.—Dance orchestra. WBBR—STATEN ISLAND, N. Y.—278 8 p. m.—Syrian Orinetal music. 8:10 p. m.—World news digest. 8:25 p. m.—Syrian Orinetal music. 8:35 p. m.—Bible instruction. 8:50 p. m.—Syrian Oriental music. WAHG-RICHMOND HILL, N. Y.-316

WAHG—RICHMOND HILL, N. Y.—316
12 noon—Musical program.
7:30 p. m.—Taik, Maurice E. Connolly,
7:45 p. m.—Frank Ochs, tenor,
8 p. m.—Frank Ochs, tenor,
8 p. m.—Fytapatrick Brothers,
8:15 p. m.—Synchropase Trio,
8:30 p. m.—Hovace Taylor, reader,
8:45 p. m.—Helen Marshall, soprano,
9 p. m.—Frank Ochs, tenor,
9:15 p. m.—Frank Ochs, tenor,
9:15 p. m.—Frank Ochs, tenor,
9:30 p. m.—Synchrophase Trio,
9:45 p. m.—Horace Taylor, reader,
10 p. m.—Helen Marshall, soprano,
10:15 p. m.—Smith's Orchestra,
WOR—NEWARK—405

10:15 p. m.—Smith's Orchestra.

6:45, 7:15 and 7:45 a. m.—Gym class.
2:30 p. m.—Oreste's Orchestra.
3:15 p. m.—Dick and Flo Bernard, songs.
3:30 p. m.—Dick and Flo Bernard, songs.
3:45 p. m.—Dick and Flo Bernard, songs.
6:15 p. m.—Words Mispronounced."
6:17 p. m.—"Words Mispronounced."
6:17 p. m.—"Sports," Bill Wathey.
6:30 p. m.—Shelton dinner music.
7:30 p. m.—Eddie Elkins's Orchestra.
8 p. m.—Joseph M. Barnett, barytone.
8:15 p. m.—Ballin and Race, planists.
8:30 p. m.—Hallin and Race, planists.
8:30 p. m.—Edward Bierstadt, "Tenochtit-145 p. m.—Ballin and Race, planists. 0 p. m.—News bulletin.
0:10 p. m.—Jossica Kenyon, soprano.
0:30 p. m.—Archie Slater's Orchestra.
1 p. m.—Jack Mills's Musical Aldermen.
1:30 p. m.—Irving Aronson's dance musical

WGCP-NEWARK-252 Evt Rothenberg, pianis www.r-NEWARK-252
m.—Evt Rothenberg, planiste,
p. m.—Andy Pendleton's Band,
m.—Joe Ross, harmonica.
p. m.—Shirley Herman, singer,
p. m.—Uncle Robert's pals,
m.—Orchestra.
p. m.—Dominion Orchestra.
p. m.—Dominion Orchestra.
p. m.—Silvio De Rienzo, planist,
m.—Bert Dagmar, songs,
m.—Ukulele Lou Hayes,
m.—Bob Ward's little Wards,
m.—Bob Ward's little Wards,
m.—Hour of music,
p.—Ritz Orchestra.
p. —Ritz Orchestra.

WAAM-NEWARK-263 m.—Happy hour.
m.—Ben Goldfarb's Orchestra,
m.—Joint recital,
p. m.—The Sport Oracle,
p. m.—Arthur Ackerman, pianist,
m.—Josephine Swanwick, soprano,
p. m.—Philip Hochberg, violin,
p. m.—Josephine Swanwick, soprano,
p. m.—Philip Hochberg, violin,
p. m.—Prilipe Felker's nupils

m.—Brookwood Serenaders. WFI—PHILADELPHIA—395 10:30 a. m.—Solos.
10:40 a. m.—'Betty Crocker."
1 p. m.—Tea room ensemble.
1:50 p. m.—Reports.
3 p. m.—Talk; solos; poems.
3:45 p. m.—Fash; on feature.
3:30 p. m.—Concert orunestra.
7 p. m.—Bellevue Stratford Orchestr.
WLIT—PHILADELPHIA.—\$95

WLIT—PHILADELPHIA—395

12:05 p. m.—Organ recital.

12:30 p. m.—Concert orchestra.

2-3 p. m.—Concert orchestra; recital.

4:30 p. m.—'Magazine Corner.''

5 p. m.—Talks on Sesqui-Centennial.

7:30 p. m.—Dream Daddy.

8 p. m.—Short Agro-Waves.

8:15 p. m.—Artist recital.

9 p. m.—Stanley Theater: "movie" rev orchestra; organ.

0 p. m.—Dance orchestra.

0:20 p. m.—Vaudeville features.

:40 p. m.—Jimmy Jones's Syncopato WCAU—PHILADELPHIA—278 WCAU—PHILADELPHIA—278
8:10 p. m.—Carolyn Thomas, soprano,
9 p. m.—The Amsterdam Girl,
9:10 p. m.—Danny Dougherty, songs,
9:30 p. m.—Dalaware County Serenade;
10 p. m.—James Laughrey, songs,
10:10 p. m.—Walt White's music,
WIP—PHILADELPHIA—508 6:45 a. m.—Setting-up exercises 1 p. m.—Luncheon music. m.—Artist recital. m.—Market hints.

4 p. m.—Market hints.
6:05 p. m.—Dinner music.
7 p. m.—Bedtime story and roll call.
WOO—PHILADELPHIA—508
1 a. m.—Grand organ; trumpets.
1:45 p. m.—Crand organ; trumpets.
1:30 p. m.—Dinner music.
p. m.—"Your Hour."
1:30 p. m.—Thomas Hughes, pianist.
1:45 p. m.—Joseph Diskay, tenor.
p. m.—Music-by Gypsies.
9 p. m.—Grand opera, "La Gioconda."
1 p. m.—Dance music.
WPG—ATLANTIC CITI—300
1:30 p. m.—Afternoon tea music.
1 p. m.—Organ recital.

WPG—ATLANTIU UITL—Stu 4:30 p. m.—Afternoon tea music. 6:45 p. m.—Organ recital. 7 p. m.—Trio dinner music. 8 p. m.—Children's hour. 8:30 p. m.—Billy Buckley's Crew. 9 p. m.—Traymore Concert Orchestra p. m.—Dance orchestra.
WHAR—ATLANTIC CITY—275 p. m.—Seaside Trio. :30 p. m.—Fashion review. p. m.—Seaside Trio. WGY—SCHENECTADY—380

2 p. m:—Music; cooking lesson.
2:30 p. m:—Asia Orchestra.
6:30 p. m.—Dinner program.
7:15 p. m.—WGY program.
7:50 p. m.—Piano solos by Ollie Yettru and address 30 p. m.—Steinway series from WJZ. WRW—TARRYTOWN, N. Y.—272 m.—Children's stories;
p. m.—Entertainment,
p. m.—Talk. . m.—Talk,
. m.—Galaxey Orchestra,
p. m.—Frank Johnson, planist,
p. m.—WRW Serenaders,
p. m.—Galaxey Orchestra,
WGR—BUFFALO—319

WGR-BUFFALO-319

10:45 a. m.—Home service talk, 6:30 p. m.—Dinner music.

7 p. m.—Address by Ross Graves, 7:15 p. m.—Address by Frank X. Schwab, 8:30 p. m.—Dutch master's program, 9 p. m.—Concert by U. C. C. of E. 10 p. m.—Edna Hurd, soprano.

11 p. m.—1 a. m.—Supper music.

WMAK—LOCKPORT, N. V.—266 9 p. m.—Murray Whiteman's Serenade 10 p. m.—Concert. WHAM—ROCHESTER, N. Y.—278 8:30 p. m.—Eastman Theater Orci 5 p. m.—Theater organ. 7 p. m.—Eastman Theater organ. 7:30 p. m.—Weather forecast; n

WHAZ—TROY, N. Y.—380 9 p. m.—Concert from WJZ. 9:45 p. n.—Car Shop Orghestra and Enter-

tainers.

WTIC—HARTFORD, CONN.—476
6:30 p. m.—Dinner music.
7:45 p. m.—Talk, Professor Charles
Hoover.
8 p. m.—Dinner music.
WCAC—MANSFIELD, CONN.—275
7:30 p. m.—Dairy farming course.
7:45 p. m.—Program of music.

WTAR—PROVIDENCE—306 9 p. m.—Gypsies. 10 p. m.—Powers's Orchestra. WEEI—BOSTON—349 6:45 a. m.—Health exercises. 7:45 a. m.—Organ studio. 10:45 a. m.—Home service talk.

2 p. m.—Happy Hawkins's Orchestra.
3 p. m.—"What Are the Stars?"
6: 30 p. m.—Big Brother Club.
7:15 p. m.—Talk, Malcolm E. Nichols.
7:25 p. m.—Lost and found; weather port, :30 p. m.—Musicale. p. m.—Anonymous Orchestra. 3:45-11 p. m.—Program same as WEAF. 11 p. m.—Malcolm E. Nichols, candidate

8:45-11 p. m.—Program same as WEAF.

11 p. m.—Malcolm E. Nichols, candidate for Mayor of Boston.

WNAC—BOSTON—280

10:30 a. m.—Bible readings.

10:40 a. m.—Women's club talks.

11 a. m.—Talk, W. T. A. Fitzgerald.

12:15 p. m.—Organ recital.

1 p. m.—Luncheon cuncert.

4 p. m.—Copley Plaza Trio.

6 p. m.—Kiddies' Klub.

6:30 p. m.—T. D. Cook's dinner-dance.

7:20 p. m.—Talk, Dr. Walter G. McGawley.

7:35 p. m.—Talk, Thomas C. O'Brien.

7:45 p. m.—Copler orchestra.

8 p. m.—Address by Commander Rodgers.

9 p. m.—Theater stage presentations and music.

WBZ—SPRINGFIELD, MASS.—333 WBZ—SPRINGFIELD, MASS.—33 6:30 p. m.—Organ recital. 7 p. m.—Market reports. 7:05 p. m.—Lectures in Psychology. 7:30 p. m.—Capitol Theater Orchestra 8:30 p. m.—Steinway Hall program. 10:35 p. m.—Brunswick Orchestra. WTAU—WOLLAND

10:30 a. m.—Radio chats.

12 noon—Market and weather reports.

12:05-2 p. m.—Luncheon music.

7:15 p. m.—Story Teller. p. m.—Story Teller.
m.—Concert program.
WRC—WASHINGTON—469
WRC—WASHINGTON—WJZ.

a. m.—Women's hour from noon—Organ recital. m.—Shoreham Orchestra. wcap—washington—469 WCAP—WASHINGTON—469
6:45 a. m.—Health exercises.
7:20 p. m.—Market summaries.
7:30 p. m.—Robinson Trio.
8 p. m.—'Glving Your Boy's Chance."
8:15 p. m.—The Lyric Singers.
8:45 p. m.—Health talk.
9-10 p. m.—Music by gypsies.
10-11 p. m.—'Washington Post" hour.
KDKA—PITTSBURGH—309
7:30 p. h.—Children's period

7:30 p. in.—Children's period. 7:45 p. m.—University of Pittsburgh, 9 p. m.—Happy Home Hour. WCAE—PITTSBURGH—461 WCAE—PITTSBURGH—101
6:30 p. m.—Uncle Kaybee,
8 p. m.—Nixon Orchestra.
9 p. m.—Mrs. Saam.
11 p. m.—Loew's Theater program.
WADC—AKRON, OHIO—253

6:80 p. m.—Dinner concert.
WEAR—CLEVELAND—390 p. m.—Allen Theate program. WTAM—CLEVELAND—390 p. m.—Dinner music. 3-11 p. m.—Concert by artists. 7 p. m.—Dinner dance. 77 p. m.—Freda Sanker's Orchestra. 12 midnight—Concert.

-Musical program. WSAI—CINCINNATI—326 11 p. m.-1 a. m.—Concert.
WLW—CINCINNATI—422 m.—Dinner concert; theatrical review m.—"Times-Star" Concert Orchestra. WJR—PONTIAC, MICH.—517 7 p. m.—Orchestra; soloists, 9 p. m.—Musical program, 11:30 p. m.—Jewett Jesters. WWJ—DETROIT—353

m.—Orchestra and gypsies.
WREO—LANSING, MICH.—286 WREG—LANGRAM,
6 p. m.—Dinner concert.
WMAQ—CHICAGO—448
7:30 p. m.—La Salle Orchestra.
7:40 p. m.—Family Altar Legion.
WOK—CHICAGO—217
...—Mu ical features.

s p. m.-2 a, m.-Mu ical features. WHT-CHICAGO-400 7 p. m.—Classical program. 8 p. m.—Classics. WSUI—IOWA CITY—484 8:30 p. m.—College of the Air.

### TUESDAY

WJZ—NEW YORK CITY—455

10 s. m.—Women's hour.

11 a. m.—News service.

11:05 a. m.—"Arts and Decorations," Mrs. Mary Roberts.

1 p. m.—Nathan Abas's luncheon music,

2, 4, 5:30, 7:30 and 10:30 p. m.—News.

4:30 p. m.—Bernhard Levitow's Orchestra,

5:32 p. m.—Bernhard Levitow's Orchestra,

5:32 p. m.—Market quotations.

5:50 p. m.—Financial summary.

6:30 p. m.—New York University course,

7 p. m.—Dog talk, by Frank Dole, of the Herald Tribune.

7:15 p. m.—Vanderbilt Orchestra,

8 p. m.—Edison hour.

10:30 p. m.—"The Grand Tour."

10:30 p. m.—Mayflower Orchestra,

WHN—NEW YORK CITY—361

Wave Station Length Orchestra

273 252 861

MONDAY, NOVEMBER 2

M. Whiteman's
Dance music
Dance music
Billy Wynne's
Car shop
Brookwood
Powers
Smith's
WRW

St. George Archie Slater's Jimmie Jones

Dance music Ben Bernie's Ritz J. Knecht's

WFBH WGCP WHN

WOR WLIT WOO WEAF WGCP WJZ WHN

WHN-NEW YORK CITY-361 WHN-NEW YURK CAAI-OG 2:30 p. m.—Organ recital. :15-3:15 p. m.—Overture and vaudeville :15 p. m.—Lexington Theater Orchestra p. m.—Iceland Orchestra. :30 p. m.—Oakland's Chateau Shanley. 1 p. m.—Caravan Orchestra. 1:30 p. m.—Rodeo Orchestra. 12 midnight—Revue and orchestra. Eastern Standard Time

WEAF—NEW YORK CITY—492 :45 to 7:45 a. m.—Health exercises, WEAF, WEEI, WCAP. WEAF, WEEI, WCAP.

11 a. m.—Norman Curtis, planist.

11:10 a. m.—'Non-Voter.'' Sidney Usher.

11:25 a. m.—Norman Curtis, planist.

11:35 a. m.—'Motion Picture Forecast.''

11:50 a. m.—Norman Curtis, planist.

12 noon—Market and weather reports.

4 p. m.—Kathryn Chumasero, contraito.

4:15 p. m.—The Banjo Boys.

4:30 p. m.—Women's program, talk and songs.

4:30 p. m.—Women's program, talk an songs.
6 p. m.—Dinner music.
7 p. m.—Nancy McCord, soprano.
7:10 p. m.—Columbia University lecture.
7:30 p. m.—Davis Saxophone Octet.
8 p. m.—Ross Gorman's Orchestra.
8:30 p. m.—"The Twins."
9 p. m.—"Eveready Hour."
10 p. m.—Florida Trio; G. di Benedetto tenor.
10:30 p. m.—Vincent Lopez's Orchestra.
11 to 12 p. m.—Meyer Davis's Orchestra.
WIJY—NEW YORK CITY—406

WJY-NEW YORK CITY-405 30 p. m.—Ambassador Trio. 10 p. m.—"From Babylon to Banking. 120 p. m.—Adelaide Klein, contralto. WGBS-NEW YORK CITY-316 10 a. m.—Timely talks with Terese.
10:10 a. m.—Gertrude Seldenman, planist
10:20 a. m.—Household economy; planist
10:30 a. m.—Gertrude Seldenman.
10:40 a. m.—Grift talk; planist

. m.—Scripture reading. . m.—Friedel Hansen, songs. 135 p. m.—Friedel Hansen, songs.
2 p. m.—Rlalto Orchestra.
3 p. m.—Rlalto Orchestra.
3 p. m.—Interview with Homer Croy.
3:10 p. m.—Max Tepperman, violinist.
3:20 p. m.—H. M. Moses, Bible stories.
3:30 p. m.—Wax Tepperman, violinist.
3:40 p. m.—"Modern Piano Technique."
3:50 p. m.—Max Tepperman, violinist.
6 p. m.—Uncle Geebee.
6:50 p. m.—Boys' program.
6:50 p. m.—American Legion, Elmhuri Post.

6:50 p. m.—American Legion, Elmnurs Post.
7 p. m.—Arrowhead Concert Orchestra,
8 p. m.—Y. M. H. A. Vocational Forum,
8:10 p. m.—Eleanor Honan, contraito,
8:20 p. m.—Eleanor Honan, contraito,
8:20 p. m.—Eleanor Honan, contraito,
8:40 p. m.—Leanor Honan, contraito,
9 p. m.—Consonant Little Symphony,
9:10 p. m.—Leona Borroum, soprano,
9:30 p. m.—Leona Borroum, soprano,
9:30 p. m.—Leona Borroum, soprano,
9:50 p. m.—Leona Borroum, sporano,
9:50 p. m.—Consonant Little Symphony,
9:50 p. m.—Consonant Little Symphony,
10 p. m.—Rosaria Lizzo, Salvatore Gioe,
10:10 p. m.—Arrowhead Dance Orchestra
WRNY—NEW YORK CITY—259

WRNY-NEW YORK CITY-259 WRNY—NEW tolks CII—200
2:30 a. m.—News headlines.
0:30 a. m.—Reducing exercises.
0:45 a. m.—'Interior Decoration.''
1 a. m.—Arlene Felkner, soprano.
2 noon—Hour of music.
15 p. m.—Charlotte Trystman, pianist.
30 p. m.—Judith Roth, soprano.
144 p. m.—Election returns \*Preughou evening.

6:44 p. m.—Election returns "Preughout evening.
6:45 p. m.—"Scholastic Sports."
7 p. m.—"Whose Birthday To-day?"
7:05 p. m.—"Telegraph Sportflash."
7:15 p. m.—"Commerce of the Day."
7:20 p. m.—"Commerce of the Day."
7:20 p. m.—"Theater Costume."
7:45 p. m.—Roosevelt Concert Orchestra.
8:15 p. m.—Opera, "The Mikado."
9 p. m.—"Routes to Florida."
9:15 p. m.—"Routes to Florida."
9:15 p. m.—"Theater Talk."
9:30 p. m.—Sadrian Trio.
9:35 p. m.—Alexandre Zeitlin, "Sculpture."
10 p. m.—"The Luludyne," Leon Adelman,

10 p. m.—"The Luludyne," Leon Adelman 0:15 p. m.—"Current Theater."
10:30 p. m.—"Current Theater."
11 p. m.—"Town in Review."

WNYC—NEW YORK CITY—526 7 p. m.—Market high spots.
7:10 p. m.—Merrill Hughes's Ramblers.
7:30 p. m.—Police ala ms.
1:35 p. m.—Merrill Hughes's Ramblers.
8 p. m.—Election returns and musical fetures.

tures. 3:05 p. m.—Lawrence Metcalf, whist 8:05 p. m.—Lawrence Metcalf, whis solos,
8:15 p. m.—Frene Jones, soprano,
8:30 p. m.—Rudolph Joskowitz, violinist
8:45 p. m.—Virginia Pinner, soprano,
9 p. m.—Virginia Pinner, soprano,
9:10 p. m.—Virginia Pinner, soprano,
9:30 p. m.—The Allan Trio,
10 p. m.—Harry Ash's Orchestra,
10:30 p. m.—Police alarms; weather,
10:35 p. m.—Harry Ash's Orchestra,
10 p. m.—Greetings from the Mayor-ele
WMCA—NEW YORK CITY—341
11 a. m.—Ida Allen's "Homemaker's Hou

WMCA—NEW YORK CITY—341

11 a. m.—Ida Allen's "Homemaker's Hour,
6 p. m.—Olcott Vail's String Ensemble,
6:30 p. m.—Frank Gebbia's Orchestra,
7 p. m.—Jack Wilbur's Personalities,
8 p. m.—George Remmel, pianist.
9:30 p. m.—Sanuel Heller, readings,
9 p. m.—May Singhi Breen, Peter de Rose
"Four Jack Roses." "Four Jack Roses."

9:30 p. m.—Marion Lindsay, soprano.

'0 p. m.—"Europe's Changing Boundaries.'

10:20 p. m.—Hye Sorensen, barytone.

10:40 p. m.—Joyce Mereddith, readings,

11 p. m.—Ernie Golden's Orchestra. WEBJ-NEW YORK CITY-273 p. m.—Original Mobile Quintet.

45 p. m.—Sara Turits, soprano.
p. m.—Rallroad talk, Garrow Geer

10 p. m.—Radio Chats.

225 p. m.—Leon H. Fox. violinist. 240 p. m.—Norman Hennegeld, pianist. 250 p. m.—Leon Fox, violinist. wFBH—NEW YORK CITY—273
2 p. m.—Bob Fleming's Orchestra.
3 p. m.—Marjorie Wall, soprano.
3:15 p. m.—Henrietta Cross and Mauri.
Abrahms.
3:30 p. m.—Florere. Abrahms.

3:30 p. m.—Florence Duryea, violin.
4 p. m.—Joe Perney, boy soprano.
4:16 p. m.—Flano recital.
4:30 p. m.—Flano recital.
4:30 p. m.—Trea Table Talk"; must Jerome Hart.
4:45 p. m.—Mary Breslin, soprano.
5 p. m.—Ford and McLean.
5 p. m.—Ford and McLean.
5:30 p. m.—Bob Schaffer, songs.
6 p. m.—Anita Bunn, soprano.
6:15 p. m.—To be announced.
6:30 p. m.—Bossert Lumberjacks.
11:30 p. m.—Fordham Gardens. WHAP—BROOKLYN—240
6 to 7 p. m.—Dinner music.

TUESDAY, NOVEMBER S

WEDNESDAY, NOVEMBER 4

Harry Ash's Pagoda Vincent Lopes Mayflower Arrowhead Billy Hayes Meyer Davis

Fordham Dance music

Dance music
Dance music
Dance music
Dance music
Dance music
Dance music
Roseland
Ascuitto's
Strickland's
Joe Zimmerman's

Dance music Virginians Ben Bernie's Dance music Zit's

WLWL-NEW YORK CITY-288 m.—Emile L. Fanning, tenor.
p. m.—WLWL Trio.
p. m.—Grace M. Liddane, soprano.
p. m.—Question Box.
p. m.—Emile L. Fanning, tenor.
p. m.—WLWL Trio.
p. m.—Grace Liddane, soprano.
p. m.—Talk on citizenship.

9:15 p. m.—Talk on citizenship. 9:35 p. m.—John Zelman. 9:45 p. m.—WLWL Trio. WAHG-RICHMOND HILL, N. Y,-316 12 (noon)—Musical program. WOR—NEWARK—405 6:45-7:15-7:45 a. m.—Gym class. p. m.—Clarence Williams Trio.
n.—Magazine reviews.
p. m.—Fred Koester's Orchestra.
p. m.—"Words Mispronounced."
p. m.—"Sports," Blii Wathey.
p. m.—Man in the Moon Stories.
p. m.—Sneiton dinner music.
p. m.—News bulletin.

WGCP-NEWARK-252 .—Songs.
. m.—Isabelle Henderson, soprano
. m.—Bill Rietz, songs

m.—Studio progam.
m.—J. Vincent Moore, songs.
WAAM—NEWARK—263 WAMM—NEWARK—263
1 a. m.—Happy Hour; cooking lesson.
5 p. m.—Al Makon's orchestra.
7 p. m.—Joe Brown's orchestra.
7:30 p. m.—Erv Bradley, Clint Blackwell planists. planists. :05 p. m.—Alice Evans, "Motion Pic-tures." :20 p. m.—Erv Bradley, Clint Blackwell

s."

D. m.—Erv Bradley, Clint Blackwell

D. m.—Alice Laurie, soprano.

D. m.—Edgewood's orchestra.

D. m.—"New Jersey," Horace Beaver

M.—Bill McWalters, tenor. WFI-PHILADELPHIA-395 m.—Tea Room En m.—Recital.

3 p. m.—Recital,
3:45 p. m.—Adeline Rosen, whistler,
3:30 p. m.—Concert Orchestra.
7 p. m.—Dance orchestra.
8:30 p. m.—The Gold Dust Twins.
9 p. m.—Eveready Hour.
0 p. m.—Vincent Lopez's orchestra.
WLIT—PHILADELPHIA—395 m.—Organ recital.

p. m.—Concert orchestra,

p. m.—Concert orchestra; rec

p. m.—Republican Women of

4:30 p. m.—Republican Women of Pennsylvania; recital.
7:30 p. m.—Dream Daddy.
7:50 p. m.—Plays and players reviewed.
WCAU—PHILADELPHIA—278
7:30 p. m.—Recital.
8 p. m.—Building and loan talk.
8:30 p. m.—School of Oratory Players.
8:30 p. m.—Recital.
9 p. m.—"Politics," the Rev. W. Stockwell.
7:15 p. m.—Harry Link, Willie Horowitzsongs.

a. m.—Grand organ. 2 noon—Luncheon music. :45 p. m.—Grand organ and trumpets :30 p. m.—Davis' Saxophone Octet. WIP—PHILADELPHIA—508

6:45 a. m.—Setting-up exercises.

1 p. m.—Tea room orchestra.

3 p. m.—Artist recital.

6:05 p. m.—Joe Ray's Night Hawks.

7 p. m.—Roll call and birthday list.

8 p. m.—Elliott Lester. dramatic cri

8:15 p. m.—Talk by Henry E. Ehlers.

8:30 p. m.—Artist recital; election ret

10:05 p. m.—Movie Broadcast.

10:30 p. m.—Pagoda Orchestra. wPG\_ATLANTIC CITY\_300 p. m.—Luncheon music.
p. m.—Organ recital.
m.—Trio dinner music.
m.—Fashion Flashes.
p. m.—Studio Concert.
m.—Ha'l Dual Trio.

m.—Dance orchestra.
WHAR—ATLANTIC CITY—275 p. m -Strand organ recital. WGY-SCHENECTADY-380 30 p. m.—Organ recital. 20 p. m.—American Pomological pr

gram.

30 p. m.—Dinner program.

30 p. m.—"Sources of Electrons," Prof.
Peter I. Wold.

7:45 p. m. — WGY Orchestra; Ethel
Crookes, contraito.

10 p. m.—"The Grand Tour." 0 p. m.—"The Grand Tour."
0:30 p. m.—Spencer Tupman's Orchestra.
WRW—TARRYTOWN, N. Y.—273
105 p. m.—Musical program; election re-2:05 p. m.—Josephine Doerfier, soprano, 0:20 p. m.—Joseph Allen, violinist, 0:40 p. m.—John Fulton, tenor, 1:05 p. m.—WRW Orchestra. 0:00 WGR—BUFFALO, N. Y.—319

45-7:45 a. m.—Exercises. 0:45 a. m.—Home service talk. 0:05 a. m.—Eldora Stanford, soprano. 0:15 a. m.—"Child Health," Joseph Shee WHAM—ROCHESTER, N Y.—278
3:30 p. m.—Eastman Theater Orchestr 11:15 a. m.—"Child Health," Joseph Shee. han.
11:30 a. m.—Eldora Stanford, soprano.
11:40 a. m.—Talk.
11:55 a. m.—Eldora Stanford, soprano.
12:20 p. m.—Market reports.
4 p. m.—Ray Nichols Orchestra.
4:45 p. m.—Dramatized version of "Ruth and Naomi," musical accompaniment.
6 p. m.—Dinner music.
7 p. m.—Synagogue services.
7:30 p. m.—United States Army Band.
9 p. m.—Bon Bon Buddies.
3:30 p. m.—"Pooley Concert."
9 p. m.—"Waterman's Points of Progress."
10 p. m.—"Ipana Troubadours."
11-12 p. m.—Ben Bernie's Orchestra.
WEBJ—NEW YORK CITY—273 WHAM-ROUTESLEE, A 1.—2.0 30 p. m.—Eastman Theater Orchestr p. m.—Theater organ, p. m.—Eastman Theater Orchestra, 30 p. m.—Weather forecast; market wTIC-HARTFORD, CONN.-476 p. m.—Marchesi Ladies' Quartet. p. m.—Louis Sokolof, violinist.

9 p. m.—Louis Sokolof, violinist.
1:30 p. m.—Organ recital.
1:05 p. m.—Bilitmore Hotel Orchestra.
1:30 p. m.—Lloyd's Orchestra.
1:30 p. m.—Twins.
1:30 p. m.—Twins.
1:30 p. m.—Twestady Hour."
1:30 p. m.—Wefel—BOSTON—349 WEEI-BOSTON-349

7:45 a. m.—Organ studio.
p. m.—Joe Rines's Artists.
30 p. m.—Big Brother Club.
7:15 p. m.—Lost and Found; weather.
7:20 p. m.—"Air Lines," G. W. Hambiin.
30 p. m.—Musicale.
7:45 p. m.—Harvard Observatory Talk.
3-11 p. m.—Program same as WEAF.

THURSDAY, NOVEMBER 5

FRIDAY, NOVEMBER 6

WEBJ WNYC WRC WLIT WGCP WHN WRW

Dance music Koenig's Charles Kerr's Strickland's Ted Lewis

Arrowhead Ben Glaser's Vincent Lopez's

WJZ-NEW YORK CITY-455 10 a. m.—Women's, hour.
11 a. m.—News.
11 a. m.—News.
11:15 p. m.—Irwin Abrams's Orchestra.
2, 4, 5:30, 7:30, 10:30 p. m.—News.
4:05 p. m.—John Daniel, readings.
4:30 p. m.—Joseph Kneent's Orchestra.
5:32 p. m.—Stock quotations.
5:50 p. m.—Financial summery. 12:15 p. m.—Noon service. 1 p. m.—Luncheon concert.
4 p. m.—Theater music.
5 p. m.—Fulton Debating Society. 5.32 p. m.—Stock quotations.
5.50 p. m.—Financial summary.
6.30 p. m.—N. Y. University course; "Metal Levels and Limits of Ability," Pr James E. Lough.
7 p. m.—Bernhard Levitow's Orchestra.

6 p. m.—New radio club.
6:30 p. m.—New radio club.
6:30 p. m.—Dinner dance.
7:35 p. m.—Talk, "Florida."
7:45 p. m.—Broadcast from Somervi
Theater.
9:15 p. m.—Boston American Orchestra. 7 p. m.—Bernhard Levitow's Stone 8 p. m.—Zoological Society series. 8:30 p. m.—Concert; Elshuco Trio. 10:30 p. m.—Virginians. WBZ—SPRINGFIELD, MASS.—333 30 p. m.—Leo Reisman's Ensemble. 6:30 p. m.—Leo Reisman's Ensemble.
7 p. m.—Market reports.
8:15 p. m.—Special theatrical program.
9:30 p. m.—Alandale hour. WGBS—NEW YORK CITY—316
10 a. m.—Timely talks with Te.ese.
10:10 a. m.—Don Clark, "Song Factory."
10:20 a. m.—Beauty talk; songs.
10:30 a. m.—Oon Clark.
10:40 a. m.—'Housefurnishing Review WTAG-WORCESTER-268

WTAG—WURUES I EAL

10:30 a. m.—Radio chats.
12 noon—Market and weather report.
12:05-2 p. m.—Luncheon music.
5:15 p. m.—Story teller.
8-11 p. m.—Program same as WEAF. WRC-WASHINGTON-469 WRC-WASHINGTUN-409
10 a. m.—Women's hour from WJZ.
12 noon—Organ recital.
1 p. m.—New Willard Orchestra
6:50 p. m.—"Show Shopping," Le
Hall.

Hall.
7 p. m.—Shoreham Orchestra.
8 p. m.—Musicale.
9 p. m.—Ediron hour.
10 p. m.—"The Grand Tour."
10:30 p. m.—W. Spencer Tup chestra.

KDKA-PITTSBURGH-309 4:15 p. m.—University address.
3 p. m.—World cruise by radio; KDKA 1:30 p. m.—Herman Streger's Players.
p. m.—Mas M. Goodesson, "Poems."
1:15 p. m.—Jack Smith, barytone.
1:15 p. m.—Georgie Jessell interviewed.
1 p. m.—Cotton Orchestra.
1:30 p. m.—Helen Carner, planist.
1:45 p. m.—Barnett Ginsberg, violinist.
2 p. m.—Dr. Bernard Drachman, "The Five-Day Working Week."
1:05 p. m.—Cantor Samuel Weisser, songs

WCAE-PITTSBURGH-461 o. m.—Uncle Kaybee.
o. m.—Davis Saxophone Octet.
o. m.—Program same as WEAF.
WADC—AKRON, OHIO—253 m.—Dinner confert.

1.—Billing's Rambiers.

1...—Times-Press Hour.

WTAM—CLEVELAND—390

6 p. m.—Ochestra. WEAR—CLEVELAND—390 WEAR—CLEVELIATA

7 p. m.—Organ recital.
8 p. m.—Radio artists.
9 p. m.—Loew's vaudeville and music.
10 p. in.—Dister's Orchestra.

WSAI—CINCINNATI—326
8:45 p m.—Chimes concert.
) p. m.—Eveready hour,
10 p. m.—"Auction Bridge Games."
10:30 p. m.—Instrumental artists.

WLW—CINCINNATI—422
9:30 p. m.—O. Henry's "Pimienta

3:30 p. m.—O. Hen cakes" in play.

o m.—Orchestra. o p. m.#Election Night.
b. m.—Fo mica Orchestra.
WKRC—CINCINNATI—423 11 p. m.—Artists: recital, WJR—PONTIAC, MICH.—517

1 p. m.-Rainbow Skylarks a. m.—The Ginge. Hou... WCBD—ZION, ILL.—345

p. m.—Mandolin-guartet. quartet. WOC—DAVENPORT,—484 —Program from WEAF.

WEDNESDAY

WEAF—NEW YORK CITY—492

WEBJ—NEW YORK CITY—273

p. m.—Balconade's Ballroom Orchestra. 45 p. m.—Doris Sheldon, contralto. 05 p. m.—Busoni's Neapolitan Trouba-

Kentucky
Dance music
Lorraine
Loeser's
Meyer Davis's
Biltmore

Meyer Davis s
Biltmore
Ritz
Caravan
Vincent Lopez
Fordham
Dance music
Connie's

Arrowhead Eddie Elkin's

Dance music
J. Green's
Ernie Golden's
Dance music
Shoreham

9:30 p. m.—W. C. Ihlefeld, pianist. 9:45 p. m.—Thomas Prytherch, tenor.

SATURDAY, NOVEMBER 7

WFBH WHN WGCP

WOR WNYC WEEI WJZ

WGY WNAC

145 p. m.—Cataline Noack-Fique Musical Institute.

p. m.—'Whose Birthday To-day?''
115 p. m.—Commerce of the day.
20 p. m.—Code lesson.
135 p. m.—'New Inventions,'' A. P. Peck.
145 p. m.—Pietro Soldano, 'Ballade Min-stel!''
15 p. m.—Pietro Soldano, 'Ballade Min-stel!'' -Dinner concert.
-Program from WEAF.
WREO-LANSING-304 6 p. m.—Dinner concert, 8:15 p. m.—Band, glee club, artists, WHT—CHICAGO—400

30 p. m.—Talk.

445 p. m.—Samuel Poloneky, violinist.

p. m.—"Super-Power."

15 p. m.—"Architecture."

30 p. m.—"Aviation," R. Noble Estey.

445 p. m.—Bernice Kazenoff, Margar
Hart, planists. 7 p. m.—Classical program. 8:45 p. m. (238 meters)—Musical: 10:30 p. m.—Entertainers. 1 a. m.—Your Hour League. 10 p. m.—Meta Christenson Quartet. 10:30 p. m.—Biography. WMAQ—CHIUAGU—126
7:30 p. m.—La Salle Olchestra.
9 p. m.—Literary Sidelight; songs.
9:40 p. m.—Travel talk.
10 p. m.—University of Chicago, lecture.
10:20 p. m.—Western Electric Quartet.
WLS—CHICAGO—345 WMAQ-CHICAGO-448 WMCA-NEW YORK CITY-341 p. m.—Olcott Vall's Ensemble.

330 p. m.—Ernie Goldon's Orchestra.

30 p. m.—Luella E. Burns, soprano.
p. m.—Services from Northmins Church.

7:15 p. m.—Organ; story; Indian music.

KYW—CHICAGO—536
8 p. m.—Dinner concert.
9 p. m.—Musical program by artists.
11 p. m.—'Evening at Home."

WEBH—CHICAGO—370 9 p. m.—Joseph Wetzel, tenor. 9:30 p. m.—Jacke Kennedy, George Ozzello songs.

9.45 p. m.—W. Curtis Nicholson, "The Right Word."

10 p. m.—Andy Ascytto's Dance Orchestra.

11 p. m.—Hofbrau Entertainers.

11:30 p. m.—Jack Smith, songs. WEBH—CHICAGO—370
8-9 p. m.—Dinner concert.
10 p. m.—Dance selections; songs.
11 p. m.-2 a. m.—Dance music; en

WNYC-NEW YORK CITY-526 WGN-CHICAGO-370 7:30 p. m.—Dinner music. 9:30 p. m.—Classic hour. 11:30 p. m.—Dance music. WOK—CHICAGO—217 7 p. m.—Artista. 11 p. m.—Musical features. WENR—CHICAGO—266 

WNYC—NEW YOTK CITY—526

11 a. m.—"Decorative Floors."

11:15 a. m.—Morning concert.

11:45 p. m.—Joe Schmitt's recipes.

12 noom—Concert.

1:10 p. m.—Market high spots.

1:20 p. m.—Plano selections.

1:30 p. m.—Eelementary Spanish lessons.

1:30 p. m.—Dolice alarms.

1:35 p. m.—Dance Orchestra.

1:35 p. m.—Dance Orchestra.

1:35 p. m.—Clara Rosenzweig, pianiste.

1:30 p. m.—Elara Rosenzweig, pianiste.

1:30 p. m.—Elara Rosenzweig, violinist.

1:50 p. m.—Hyman Tashoff, violinist.

1:50 p. m.—Health talk, George Keane.

1:30 p. m.—Health talk, George Keane.

1:30 p. m.—Police alarms; weather.

WFBH—NEW YORK CITY—273 WFBH—NEW YORK CITY—278

WGBS-NEW YORK CITY-316

8:05 p. m.—Cantor Samuer weisser, songs 8:15 p. m.—Clarence Williams Trio. 8:45 p. m.—Hock and Jerome, songs. b. m.—L. Wolfe Gilbert, Abel Baer, songs

WRNY-NEW YORK CITY-259

0:30 a. m.—Reducing exercises. 0:45 a. m.—Health advice.

songs.
1:30 p. m.—Scripture reading.
1:35 p. m.—Ben Hyams, pianist.
2 p. m.—Leona Borroum, soprano.

15 p. m.—Tommy Lorraine's Orche
15 p. m.—Marion Doran, soprano,
30 p. m.—Jerry Antone's Orchestra,
30 p. m.—Patrick Daiy, pianist,
p. m.—Alice Robinson, soprano,
15 p. m.—Majestic String Ensemble
p. m.—Don Juilles Everglades Marii
30 p. m.—Heirlooms. 30 p. m.—Heirlooms. 35 p. m.—Yama Yama Boys. 50 p. m.—Health Talk. 1:30 p. m.—Charles Kerr's Orchestra WAHG—RICHMOND HILL, N. Y.—316 #ANG—RICHARDS | Program. | 1 non—Musical program. | 30 p. m.—Billy Eisenluth's "Lynbrook | 6:15 p. m.—Dinner concert. | 7:30 p. m.—Children's hour | 1yns." | 7:45 p. m.—University of |

130 p. m.—Jiny Essentias Lyssis, iyns,"
130 p. m.—Judith Roth, soprano.
145 p. m.—Michael Lamberti, cellist.
1 p. m.—James Savell, barytone.
130 p. m.—Judith Roth, soprano.
145 p. m.—Clifford Kilby, banjo. ) p. m.—James Savell, barytone ):15 p. m.—Joe Zimmerman's WOR—NEWARK—405 3:45-7:15-7:45 a, m.—Gym class. 2:30 p. m.—Julius Seeback, barytone. 2:45 p. m.—"The Three Wishes," playlet.

p. m.—"The Three Wishes," playlet.
m.—Julius Seeback, barytone.
p. m.—Edward Breck, planist.
p. m.—Al Wilson's Playmates,
p. m.—"Words Mispronounced."
p. m.—Bill Wathey.
p. m.—Shelton dinner music.
p. m.—Vincent Lopez Orchestra.
m.—Topics of the Day."
p. m.—The Royal Trio.
p. m.—Sam Siegel, mandolin.
p. m.—The Royal Trio.
m.—Captain Anton Heinen, "Reliabil yof Aircraft in Service."
p. m.—Katinka Narinska, planist.
p. m.—Horace J. Taylor, reader.
p. m.—News bulletin. 0 p. m.—News bulletin.
0:10 p. m.—Paragon Novelty Trio.
0:25 p. m.—William Foster, cellist,
0:45 p. m.—Paragon Novelty Trio.
1 p. m.—Zit's Orchestra.

WGCP-NEWARK-252 WGCP—NEWARK—252
3 p. m.—Songs.
3:45 p. m.—Clarence Williams Trio,
4:30 p. m.—Songs.
6 p. m.—Orchestra.
1:45 p. m.—Daddy Winkum.
7 p. m.—Dominion Orchestra.
5 p. m.—Charol de Thomee, planist.
1:15 p. m.—Hock and Jerome, songs.
9 p. m.—Hughie Woolford, planist.
1:15 p. m.—Hughie Woolford, planist.
1:15 p. m.—Nat Osborne, Eddie Marecsongs.

songs. 30 p. m.—Century Entertainers. .30 p. m.—Vin Unger, songs.
350 p. m.—Win Unger, songs.
310 p. m.—Strickland's Orchestra.
1 p. m.—Richman Entertainers.
1.45 p. m.—Strickland's Orchestra.
2 m.—Connie's Orch stra.
WAAM—NEWARK—263 WAAM—NEWARK—263

1 a. m.—Happy hour.

5 p. m.—Wallie Osborne's Orchestra.

7 p. m.—Elmer Nippes' Orchestra.

23 p. m.—Elmer Nippes' Orchestra.

25 p. m.—Thomas Hewson, tenor.

26 p. m.—Arthur Fischer, vielinist. 8:35 p. m.—Helen Sternberg, pianist. 8:20 p. m.—Arthur Fischer, violinist. 9 p. m.—Naborhood Merchants program. 9:30 p. m.—Olivette Wilhelm, soprano. 9:50 p. m.—Entertainers. 10:15 p. m.—Olivette Wilhelm, soprano. 10:30 p. m.—Joe Furtner, zither; Anthony Schreck, guitar WFI-PHILADELPHIA-395

10:30 a. m.—Solos, 10:40 a. m.—Home service talk, 1 p. m.—Tea room ensemble, 3 p. m.—Program by pupils of F. J. grove. 45 p. m.—Fashion feature. 30 p. m.—Concert orchestra. p. m.—Dance orchestra.

WLIT—PHILADELPHIA—395 12:05 p. m.—Organ recital; religious vice. 12:30 p. m.—Concert orchestra. 2-3 p. m.—Concert orchestra; recital. 4:30 p. m.—Talks; recital. 7:30 p. m.—Dream Daddy.

t. m.—Setting-up exercises
1.—Artist recital.

1. p. m.—Arust recital.
1. 5.05 p. m.—Dinner music.
1. p. m.—Bedtime story and roll call.
1. w00—PHILADELPHIA—508
11 a. m.—Grand organ.
12 noon—Luncheon music. 12 noon—Luncheon music.
145 p. m.—Grand organ; trumpets.
130 p. m.—Dinner music.
15 p. m.—United States Army Band.
130 p. m.—"Pooley Period."
15 p. m.—Waterman's Points of Program of Prog p. m.—Dance music. WGY—SCHENECTADY—380

":30 p. m.—Program for children.

:45 p. m.—Strand Theatre Orchestra,

l p. m.—'Book of Knowledge."

3:30 p. m.—Stelnway Series from WJZ.

WRW—TARRYTOWN, N. Y.—273

10:05 p. m.—Nicolas Koenig's Orchestra.

10:40 p. m.—Eddie Brown, harmonica.

11:05 n. m.—Nicolas Koenig's Orchestra. 9-11 p. m.—Jointly with WEAF. 11 p. m.-1 a. m.—Supper music. WHAM—ROCHESTER, N. Y.—278 9:40 a. m.—heaith advice.

1 a. m.—"Garden Lore."

1:15 a. m.—Marion Selig, songs.

1:30 a. m.—Club women's talk.

2 noon—Hour of music.

1:15 p. m.—Clara Viertel's children's songs.

1:30 p. m.—Symphony Society.

1:45 p. m.—Cataline Noack-Fique Musical

WHAM—ROCHESTER, N. Y.—278

3:30 p. m.—Eastman Theater Orchestra.

7 p. m.—Theater organ.

7 p. m.—Theater orchestra.

7 p. m.—Weather forecast; markets.

WMAK—LOCKPORT, N. Y.—266

8.0 p. w.—Dance Orchestra. 8-9 p. m.—Dance Orchestra.
WTIC—HARTFORD, CONN.—476

7:30 p. m.—Commerce of the day.
7:20 p. m.—Code lesson.
7:35 p. m.—'New Inventions," A. P. Peck
7:45 p. m.—Pietro Soldano, "Ballade Minstell"
p. m.—Dr. Spaeth's artists and orchestra.
30 p. m.—Talk.
9:45 p. m.—Samuel Polonsky, violinist.
p. m.—"Supper-Power."
p. m.—"Supper-Power."
17:30 p. m.—Waterman's Points of Progress.
10 p. m.—Musical program.
17:30 p. m.—Waterman's Points of Progress.
18:30 p. m.—Waterman's Paints of Exchange.
30 p. m.—Waterman's Points of Progress.
30 p. m.—Waterman's Points of Progress.
30 p. m.—Waterman's Paints of Progress.
30 p. m.—Waterman's Points of Progress.
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30 p. m.—Waterman's Paints of Progress.
30 p. m.—Waterman's Points of Progress.

Torrey.
7:45 p. m.—Program of music.
WNAC—BOSTON—280 10:30 a. m.—Bible readings. 10:40 a. m.—Women's Club talks. 10:40 a. m.—Women's Club talks.

12:15 p. m.—Noon service.

1 p. m.—Luncheon concert.

4 p. m.—Tea dance.

1:20 p. m.—Vocal and piano solos.

1 p. m.—Kiddies' Klub.

1:30 p. m.—Checker Inn dinner dance.

1 p. m.—Musical program.

1 p. m.—Organ recital.

2 weel—BOSTON—349

WEEI—BOSTON—349

1:45 a. m.—Health exercises.

1:45 a. m.—Organ studio.

1:45 a. m.—Home Service Talk.
p. m.—"Sculpture," Cyrus Dallin.

1:15 p. m.—Johnnie Bowles's Orchestra.

1:30 p. m.—Big Brother Club.

1:5 p. m.—Lost and Found; weather.

1:30 p. m.—Musicale.

1:11 p. m.—Program same as WEAF.

1.30 p. m.—Musicale.
1-11 p. m.—Program same as WEAF.
WEZ—SPRINGFIELD, MASS.—333
8:30 p. m.—Leo Reisman's Ensemble.
7 p. m.—Market reports.
7:05 p. m.—Dorothy Morgan, soprano.
7:30 p. m.—Radio nature story.
8 p. m.—J. Malcolm Warren, tenor.
8:15 p. m.—Middred Bryant, soprano.
8:30 p. m.—Steinway Hall, featuring Elshuco Trio.

:15 p. m.—Concert program. WRC—WASHINGTON—469 noon—Organ recital.

m.—Washington Orchestra.
p. m.—Musical program.

WCAP—WASHINGTON—469 3:45 a. m.—Health exercises. 7:20 p. m.—Market summaries. 7:30-8 p. m.—Concert by Arm

ress."
10-11 p. m.—Ipana Troubadours.
11-12 p. m.—Dance music.
KDKA—PTTTSBURGH—309

o. m.—Dinner concert.
o. m.—The Sunshine Girl.
o. m.—Pooley period.
n.—Watermann hour.
WADC—AKRON, OHIO—258 6:30 p. m.—Portage Quintet. WTAM—CLEVELAND—390 p. m.—Dinner music. to 11 p. m.—Musical program. m.—Dance music. WEAR—CLEVELAND—390 WKRC—CINCINNATI—422 9:15 p. m.—Dance music. 9:45 p. m.—Studio features. 10:15 p. m.—McKay's Dance Orchestra. WSAI—CINCINNATI—326

11 p. m.—Vocal soloists; quartet.
WLW—CINCINNATI—422 8 p. m.—Dinner concert.
8:30 p. m.—National Radio Farm Council
9:15 p. m.—Concert orchestra.
10:30 p. m.—Mary Cheney, soprano.
11 p. m.—Pep concert.
11:30 p. m.—Male quartet.
12:15 a. m.—Trio concert.
12:15 a. m.—Dinner concert.
8 p. m.—Dinner concert.
9 p. m.—Same as WEAF.
WWH—PONTHAC, MICH.—517
7 p. m.—Jean Goldkette's Orchestra; sok

9 p. m.—Burroughs Hour. 11:30 p. m.—Jewett Jes'ers. WREO—LANSING—286 6 to 7 p. m.—Dinner concert.

KYW—CHICAGO—536 KYW—CHICAGO—536
p. m.—Dinner concert.
p. m.—Musical program.
1 p. m.—Midnight revue; Coon
Nighthawks; organ solo.
to 3 a. m.—'Insomnia Club."

WGN—CHICAGO—370

WGN—CHICAGO—370

10:30 p. m.—Dinner music.
12:30 a. m.—Dinner music.
WGJ—CHICAGO—447

8 p. m.—Rainbow Orchestra.
11 p. m.—Musical program.
2 a. m.—Ginger hour.
WEBH—CHICAGO—370 10 p. m.—Dance selections, 12 to 2 a. m.—Dance music; songs; revue WLS—CHICAGO—345

7:15 to 12 p. m.—Organ; story; orchestr Irish music; Ford and Glenn. WENR—CHICAGO—266

WENK-UHICAGO-200
9 to 11 p. m.—Popular program,
1 to 3 a. m.—Midnight frolic.

9 p. m.—Northwestern University lecture, 9:36 p. m.—Faculty of De Paul University, 10 p. m.—WMAQ Players, WHT—CHICAGO—400
7 p. m.—Classical program. 8:45 p. m. (238 meters)—Musical features, 10:30 p. m.—Organ recital.
1 a. m.—Your Hour League, WOK—CHICAGO—217 8:45 p. m—College of the Air.
WOC—DAVENPORT—484
6:45 p. m.—Chimes concert.

### 10 p. m.—Program same as WEAF. **THURSDAY**

WJZ-NEW YORK CITY-455 WJZ—NEW YORK CITY—455

10 a. m.—Women's hour.

11 a. m.—News.

11:05 a. m.—Health Speakers' Service.

1 p. m.—Nathan Abas's Orchestra.

1:30 p. m.—Nathan Security League luncheon. Speaker, Hon. Fred Hale.

3:30 p. m.—Laying of cornerstone of annex to Seamen's Church Institute. Speakers, Rt. Rev. William T. Manning. Edmund L. Boylies, William S. Sims, Dr. John H. Finley; Old Trinity Church Choir.

Choir.
4:30 p. m.—Commodore Orchestra.
5:32 p. m.—Market quotations.
5:50 p. m.—Financial summary.
6:30 p. m.—N. Y. University course;
"Value of Greek and Latin for Culture and Discipline," Prof. Raiph V. Mogofand p. m.—Bernhard Levitow's Dinner Orchestra.

8 p. m.—U. S. Army Band.

9:30 p. m.—Royal Salon Orchestra.

10:30 p. m.—Ben Glaser's Orchestra.

WEAF—NEW YORK CITY—492 6:45-7:45 a. m.—Health exercises. l a. m.—Arline Fe.ker, soprano. 11:10 a. m.—Talk to housewives. 11:10 a. m.—Talk to housewives.

11:25 a. m.—Arline Felker, soprano.

11:35 a. m.—Talk to housewives.

11:45 a. m.—Arline Felker, soprano.

12 noon—Market and weather reports.

4 p. m.—Anne Klaasen, soprano.

4:15 p. m.—Music.

4:30 p. m.—Dewitt Mathews, tenor.

4:45 p. m.—'Country House," Henry Humphrey.

6 p. m.—Dinner music.

7 p. m.—Midweek services; Arthur Hunt, baritone; Louis Caton, tenor. Address by the Rev. J. Howard Brinckerhoff.

7:30 p. m.—"Serenaders."

8 p. m.— "Larkinites."

8:30 p. m.—"Coring," George Cooley.

8 p. m.— "Larkinited."
8:30 p. m.—"Touring," George Cooley,
9 p. m.—Concert ensemble.
10 p. m.—The Zippers.
11-12 p. m.—Vincent Lopez's Orchestra. WJY-NEW YORK CITY-405 7:30 p. m.—Vanderbilt Orchestra. 8:15 p. m.—"The Morgan Horse," E. C.

Stillman.

8:30 p. m.—To be announced.

9 p. m.—'Vienna—Old and New,'' Wilsliam Ford Unson.

WGBS—NEW YORK CITY—316 a. m.—Timely talks with Terese. 20 a. m.—Ella Bayner, soprano. 20 a. m.—Hazel Lee, readings. 30 a. m.—Ella Bayner, soprano. 40 a. m.—Retter Homes and Gardens. 10:40 a. m.—Wetter Homes and Gardens, 10:50 a. m.—Ella Rayner, soprano. 1:30 p. m.—Scripture reading. 1:35 p. m.—Nat Katz's Orchestra. 3 p. m.—Interview with Samson Raphael son. 3:10 p. m.—"Woman in the Home" hour.

son.

3:10 p. m.—"Woman in the Home" hours
6 p. m.—Uncle Geebee.
6:30 p. m.—Sunset String Trio.
6:50 p. m.—"What the World Is Doing."
7 p. m.—Voltaire Hour of Music.
8 p. m.—Crystal Palace Orchestra.
8:30 p. m.—Greta Lingletter, contralto.
8:40 p. m.—Gertude Seidenmann, planist.
8:50 p. m.—Juanita Stewart, spirituals.
9 p. m.—Shell Beach String Trio.
10:10 p. m.—Shell Beach String Trio.
10:10 p. m.—Shell Beach String Trio.
10:30 p. m.—Shell Beach String Trio.
10:30 p. m.—Shell Beach String Trio.
10:30 p. m.—Arrowhead Orchestra.
WMCA—NEW YORK CITY—341
6 p. m.—Olectt Vail's String Ensemble.
6:30 p. m.—Robert Soffer, planist.
7 p. m.—Joe Chapello's Orchestra.
7 p. m.—Jec Chapello's Orchestra.
8 p. m.—Hale and Hearty."
8:30 p. m.—Aeolian Waldon, soprano.
9:45 p. m.—Nana Holmes, readings.
9 p. m.—Bessie Dodge, soprano.
9:45 p. m.—Nana Holmes, readings.
9 p. m.—Bessie Dodge, soprano.
9:45 p. m.—Nana Holmes, readings.
9 p. m.—How to Drive Automobiles.
10:03 p. m.—Nichols Trio.
10:30 p. m.—Manhattan Serenaders.
11 p. m.—Ernie Go'den's Orchestra.
WHN—NEW YORK CITY—361
12:30 p. m.—Organ recital.

12:30 p. m.—Organ recital.
3:15 p. m.—Lexington Orchestra.
4:30 p. m.—Miller, Piotti, Val, songs.
4:45 p. m.—Perry Bradford's Entertains 6:30 p. m.—Leslie McLeod, tenor.

6:40 p. m.—Susshine Talk, Billy B. Va. 7 p. m.—Iceland Orchestra 7:30 p. m.—Kennedy's Quintet. 8 p. m.—Oakland's Chateau Shanley, 8:30 p. m.—Garadian Entertainers, 9 p. m.—Jimmy Clarke's Entertainers, 9 p. m.—Jack Davis, barytone. 10:30 p. m.—Swanee Orchestra. 11 p. m.—Swanee Orchestra. 11 p. m.—Swanee Orchestra. 12 midnight—Tod Lewis's Orchestra. WRNY—NEW YORK CITY—259 9:30 a. m.—News headlines. 10:30 a. m.—News headlines. 10:45 a. m.—'1100 Years in Painting.\* 11 a. m.—Clara Viertel's children's song 11:15 a. m.—Music talk. 12 noon—Trinity Six Hour of Music, 115 p. m.—Afternoon program.

12 noon—Trinity Six Hour of Music.
4:15 p. m.—Afternoon program.
4:30 p. m.—Virginia LeFevre, contraite.
6:45 p. m.—Dr. Jonah B. Wise.
7 p. m.—"Whose Birthday To-day?"
7:05 p. m.—Sport flash.
7:15 p. m.—Commerce of the day.
7:20 p. m.—Commerce of the day.
7:30 p. m.—Isaiah Seligman.
7:45 p. m.—"Tales of Araby."
8 p. m.—Concert orchestra.
8:30 p. m.—"Radio Questions and Answers."

swers."
8:45 p. m.—'Chife's Jokes."
9 p. m.—'Chemical Magic and Tricks,"
9:15 p. m.—Alexander Chigrinsky, pian 9:30 p. m.-"Essays Philosophy." Anits Brown.—Bill Reitz, songs.
9:35 p. m.—Besta Crowell's Theater.
10 p. m.—Volga Trio.

WNYC—NEW YORK CITY—526
7 p. m.—Market high spots.
7:10 p. m.—Southland Dance Orchestra.
7:30 p. m.—Police alarms.
7:35 p. m.—Trend of the Times."
7:55 p. m.—Dance orchestra.
8:30 p. m.—Safety Night; addresses by
Rev. Dr. Charles H. Rust; musical features.

10:35 p. m.—Police alarms; weather. WFBH—NEW YORK CITY—273

WFBH—NEW YORK CITY—273
2 p. m.—Arthur Kraus's Orchestra.
3 p. m.—Johnny Gerhardt's Orchestra.
4 p. m.—Radiovues by Mrs. Owen Kidare.
4:80 p. m.—Bill Cohen's Hottentots.
5:30 p. m.—Lou Lockett, violinist.
6 p. m.—Anna Balthy, soprano.
6:15 p. m.—Katherine Connolly, songa.
6:30 p. m.—Sammy Wilson, pianist.
7 p. m.—Charles Kerr's Orchestra.
7:30 p. m.—Paul Epps Revellers.
11:30 p. m.—Don Juelle's Mariners.
WOKO—NEW YORK CITY—233
8 p. m.—Jerry Alexander, pianist. 8 p. m.—Jerry Alexander, pianis 8:15 p. m.—Mabel Montgomery, 8:35 p. m.—Stella Rose, Naomi wein, songs. 8:50 p. m.—Lehigh Serenaders. 9:20 p. m.—Doyle sisters. 9:35 p. m.—Lehigh Serenaders. WBBR—STATEN ISLAND, N. Y.—273

8 p. m.—Hawaiian Quartet. 8:10 p. m.—Mrs. Benjamin Brown, se 8:20 p. m.—Sunday School lesson. 8:40 p. m.—Mrs. Benjamin Brow. 8:50 p. m.—Hawalian Quartet. (Continued on next page)

**World Radio History** 

Dance Orchestras for This Week

very interesting talk. This is a phenomenon that cannot be remedied in any way, and there is no earthly use

will not come until the condition that

to do if this fading becomes pro-

nounced and that is to tune in a

station at an extremely different di-

rection and forget for the time being

The size of the set seems to worry

ploy radio-frequency amplification

the one that gives you trouble.

### **Elementary Information** For the Radio Novice in your trying to manipulate the receiver to bring the wave back, for it

A Radio Receiver Cannot Be Expected to Pick Up | Caused 11 to disappear 15 removed. Many theories have been advanced as the Signals of Broadcasting Stations More Than 100 Miles Away During Daylight

This is the last of a series of twenty-four lectures for the radio layman, which have been broadcast through KDKA, the Westinghouse Electric and Manufacturing Company's station at East Pittsburgh, Pa.

#### By James W. H. Weir,

Technical Editor, "The National Stockman and Farmer" TE ARE now on the last chapter of our radio course. More if they have a cedar chest with a mul-

than seven hundred students in all parts of the country have titude of dials and a flock of tubes followed these radio lessons to their completion and have their chances are better than the expressed their appreciation in one form or another. If it is not asking average radio fan who operates from too much I would like very much to have those of you who have fol- one to five tubes. Such is not the lowed this series of articles drop me a line just to let me know whether case. An efficient one-tube set will or not they have been beneficial to you. pick up the signal just as readily as a two or three tube audio-frequency

And now for our closing story. In America are thousands who are con- even though the station to which you audio-frequency set because there are tinually aggravated by the fact that are listening is a thousand miles some two or three tube sets that emthe daytime. In fact, there are many who are unable to get any stations at all during the day, due to he fact that they are living beyond the daylight range of the nearest transmitting station. It is said that the daylight range of a 500-watt transmitter is but 100 miles and of course such being the case there are comparatively few who will be able to get any The truth of the matter really is that results are to be expected. during the daytime the signals may be reaching you, but the receiving

evening and late night exceptionally inserting his selection of parts rather long distances are recorded almost than that of the editor of the parconstantly and instead of hundreds ticular diagram or plan which he is "static" predominates during several of unit to use. They would tell you in the circuit, however, it would be months of the year such distance re- to get one of this and one of that and impossible to obtain distances such ception is almost as impossible as so on. When you follow a certain as are recorded with sets that em-

In the early evening the radio waves ning to end. Do not make substituspread out farther from the trans- tions, and when in doubt do not conmitter and as night begins to fall the sult a so-called expert in your neighcarrier wave is first heard faintly, borhood, but rather take the time to until finally it brings to you the voice from which you are working. and music from a point hundreds of One other nasty feature about radio miles away. At various times during is the tendency of a broadcasting the late night and early morning the station to fade right in the midst of signals are strong enough to operate a charming musical selection or a

The Rotor Ship Has Half K. W. Radio Set

Anton Flettner's rotor ship, the Baden-Baden, arrived in New York

Harbor after having completed the first trans-Atlantic trip credited

to a vessel of this type. The radio equipment used during the voy.

age, which consists of a one-half kilowatt transmitter, is shown

above. Peter Braun, radio operator, is adjusting the controls.

the ranks of the radio enthusiasts of a loud speaker in an excellent manner lacking. I say two or three tube

It takes a very good receiver to before the detector, and this enables operate efficiently over such an ex- them to pick up fainter signals than treme range. You may be the proud a single one-tube set would permit possessor of the very latest type of It makes no difference, however, how supersensitive receiver, while your many stages of audio-frequency amneighbor perhaps has hastily thrown plification you use, for if the signal together a mass of parts to get re- is not capable of being picked up on sults. Doubtless you will be able to the detector tube alone all the audio get the feeble carrier waves long in frequency in the world won't give advance of your neighbor, despite the you a bigger range. The one-tube but the high powered stations during fact that he may be located within a set, of course, limits the operator to stances reception beyond this limit because his set requires a much may be used satisfactorily, but if stone's throw of your house. This is the use of headphones. Two sets has been recorded, and it is safe to stronger signal to actuate the detector more are required it is better to use assure that such reception is "freak- than does yours. I do not mean to a single stage of audio-frequency amish" rather than the usual thing. infer by this that a perfect and sen-Therefore if you are located outside sitive receiving set is impossible to desired two stages of amplification the area over which the transmitter is construct. Such is not the case, for will be found plentiful tapable of acting there is small chance many people who have had little or no There are many letters received of your being able to receive broad- knowledge of radio have constructed that tell of the almost unheard of casts during the day with the present sets that are extremely creditable. To distance performance of the simple radio receiving sets. Sometime in build such a set, however, requires little crystal set. There is no doubt the future perhaps the conflicting ob-

stacles may be removed, but at in a day, and extreme care must be records are "freak" receptions. It present the outlook is very remete. taken in its make-up if the ultimate would be impossible for the average fan to take the simple crystal Judging from the many inquiries detector type of receiver and record equipment used, although extremely that the average tendency on the part 500 to 1,000 miles away. One out of received on the subject I have found signals originating anywhere from Bensitive, is not of a degree sufficient of the amateur experimenter is to a hundred might get away with it. to enable you to pick up and render intelligible the weak electrical waves of cheap parts in the effort to condetector undoubtedly will give clearer traveling over extreme distances or cheap parts in the effort to condetector undoubtedly will give clearer struct a real set. He pays little or detector undoubtedly will give clearer On the other hand, during the early given and merely follows the diagram, no attention to the specifications and perhaps more natural reception, Nowadays the crystal is playing an many radio fans measure the recepfollowing. This action nearly always important part in a number of reflex tion distances in thousands of miles. ends disastrously. If this was in-There is one exception even to this tended the publishers would not go affords good quality and clean tones. and that is that in places where to the trouble to publish a set type Without the aid of the vacuum tubes

plan follow it specifically from begin- ploy it as their means of detection.

Rotor Ship Inventor to

Speak of His Inventions gradually increasing in intensity, write the publishers of the diagram rotor ship, who will speak on his inventions from WOR next Saturday evening at 10 o'clock, is a descendant of many generations of ship owners. His father was one of the first ship owners to enter a steam tug and his comprehensive mind replaced the towpath mule with steam power. After attending primary and high Anton Flettner went to sea with the intention of becoming an officer in the merchant marine, but color blindness halted his steps and he became instead a teacher of physics and

mathematics in technical schools. Mr. Flettner is the inventor and patentee of a method for wireless control of ships and vehicles at distances. At the outbreak of the war Mr. Flettner was called into the Army Aviation Department, and many of his inventions were developed and used by the army, among them the remote control of airships.

X-Ray Makes Interference X-ray machines are notorious generators of vagrant radio waves that make themselves audible in nearby receiving sets as harsh, grumbling noises. The small portable "violet ray" affairs sold for home

electro-therapeutic treatment are

also bad offenders, and their use

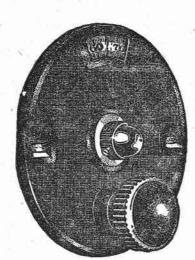
during evening hours should be as

limited as possible

AUTHORIZED AGENT Stromberg Carlson, R C A, Freshman, Atwater Kent and others. Our 100% guarantee and free service or one year with all standard sets sold

SHEARN 1122 Madison Ave., at 84th St. 8 East Fordham Road

#### to the cause of this, particularly of radio reception, but it seems as if we Give your set full chance are as far away from the solution as ever. Some say it is caused by atto do its best .... mospheric conditions and others attribute it to the changes in cloud strata. There remains but one thing



Give it the swift responsiveness it needs today. Tune with the micrometer-smooth precision, of new-day MAR-CO

Theyspliteach degree into hairline fineness. Without trace of "play", they respond instantly to your lightest touch. And you pencil the station letters in the slots right on the dial itself. Have a good radio dealer show you how easily, how quickly, you can equip your set with MAR-CO Dials. They Martin Copeland Company, Providence, R. I.; 37 Maiden Lane, New York; Madison Street and



The 1926 model tuning control

### GREENHUTS "The Radio Hub of New York"

6 Warren Street Reg. \$15.00 Reg. \$25.00 LATEST PARAGON SETS

-GROSLEY SETS

SUPER-TRIRDYN SPECIAL Incorporating the famous Trirdyn hook-up, this set brings in stations sharp, clear and mellow. \$50 Reg. Super-Trirdyn. 17.99 \$9.75 "P U P" 3.99

Ware Neutrodyne 3 Tube.. 9.99 \$60 5 Tube T.R.E. Set.... 14.99 RIGHT

SANGAMO Mica Condensers

Solidly Molded in Bakelite Heatproof and Waterproof Not hurt by soldering irons -spilled battery acid-wet

weather or knockabout-

use -Accurate -- and stay

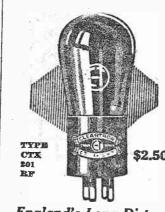
accurate Try Sangamo By-pass Condensers



■ distant station—one that you can hardly hear. Then substitute Cleartron R. F. Tubes for the tubes you are now using in the radio frequency stages of

Note the remarkable increase in volume-positive proof that Cleartrons do give greater R. F. am-





England's Long-Distance R. F. Tube EXCLUSIVE DISTRIBUTORS

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## THE NEW YORK HERALD NewYorksissatibune

SECTION TEN

performance. The "some day"

has arrived for Paul Hollings-

head, a discriminating amateur

of many years experience in the

radio field. He has built an

eight-tube super-heterodyne, for

which he does not need to offer

any apologies. It is one of the

finest examples of amateur radio

construction that this writer has

ever seen. And it does all those

things, you know, that a good re-

ceiver is supposed to do. It

brings in the DX, it cuts out the

local interference and it does de-

liver signals fit for a cone

The circuit follows closely to

standard design, as will be seen

from the diagram, except in a

few places where minor innova-

tions have been introduced. Al-

though the diagram shows an an-

tenna and a ground, together

with a radio-frequency input

transformer, L-1, L-2, the set is

primarily intended for use with a

loop pick-up system. The an-

tenna and ground circuit are

added when extreme distance is desired.

former L-1, L-2 the leads to coil L-2

is used it should be an ordinary radio

the broadcast range with the tuning con-

denser C-2, which should preferably be

Regeneration is introduced into the

modulator tube by feeding back energy

from the plate through the midget con-

denser C-3 and through a portion of the

loop or of the secondary coil L-2, or by

the Hartley parallel feed method. The

midget condenser gives a satisfactory

control of the amount of regeneration,

provided the proper number of turns be

included in the plate circuit. In the case

one of the .0005 mfd. capacity.

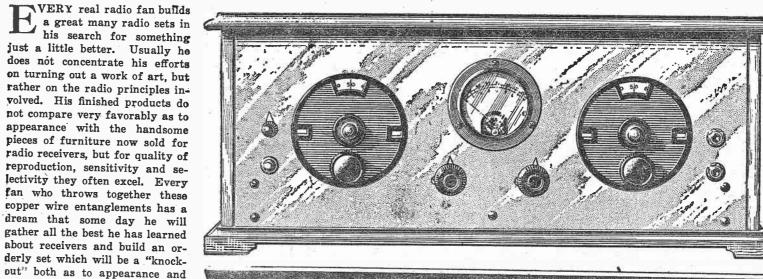
speaker.

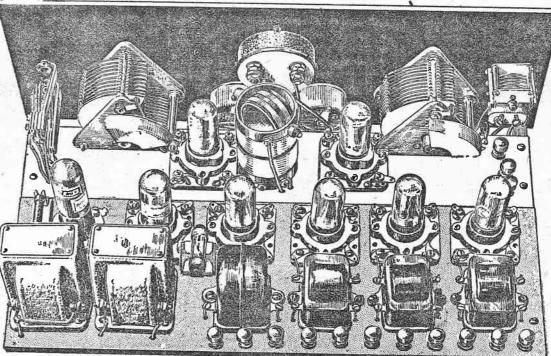
SUNDAY, MAY 16, 1926

## Compact Eight-Tube "Super-Het"

This Receiver Employs Three Stages of Transformer Coupled Intermediate Frequency Amplification, One Transformer Coupled and One Impedance Coupled Stage of A. F.

By J. E. ANDERSON





These drawings show how the parts should be arranged on the panel and sub-base panel

secondary fifty-two turns. The pick-up To substitute the loop for the trans- coil, L-5, is wound on 1.5-inch bakelite tubing and it contains twenty-four turns are cut out at the points marked X and of No. 24 double silk-covered wire. It is the loop terminals connected here. As mounted inside the oscillator coil, L-4, in will be seen, there are three leads to this such a manner that it may be rotated coil, one running to a tap near the low through an angle of 360 degrees. There potential end of the coil. When L-1, L-2 is no control for this variation brought out on the panel, because the pick-up frequency transformer which will cover may be adjusted once for all until the operation is satisfactory. The condenser, C-4, across the oscillator coil is of the same size as C-2. Condenser C-1 is of .0025 mfd. and is merely a by-pass across the C battery.

The first three intermediate frequency transformers, T-1, T-2 and T-3, are of the iron core type. T-4 is a tuned air-core transformer, responding to a frequency of 30,000 cycles per second. These four transformers taken together constitute a satisfactory filter in the intermediate frequency level.

of L-2 the tap is placed at the fifteenth The first detector, or rather the moduturn measured from the plate end of the lator, operates on the principle of negatively biased grid. The second detector The two windings, L-3 and L-4, assooperates on the principle of blocking conciated with the oscillator, are wound on denser and grid leak. The condenser C-5 a piece of bakelite 2 inches in diameter | is a .00025 mfd. mica instrument and the with No. 30 double silk-covered wire, the grid leak, R-1, is a variable, liquid-filled tickler containing forty turns and the affair.

ever, could well be a smaller condenser, say a .001 mfd. The larger this condenser is the more will the high frequencies in the signal be suppressed. Hence, it is important not to use a condenser here larger than is absolutely necessary. If the circuit seems to give as loud signals for all carrier frequencies with no condenser as with it, then by all means omit it. The condenser across the secondary of transformer T-4-namely, C-0, is an integral part of the transformer and should not be included in the list of parts. It is given on the diagram just to show that it is actually there. If some other filter transformer be used, one in which this condenser is not incorporated, it will be necessary to include one and to adjust

it carefully so that the filter transformer

The by-pass condenser, C-6, is the same

size as C-1, namely, .0025 mfd. This, how-

will be in tune with the same frequency as the one for which the iron core transformers are most responsive. Transformer T-5, which was actually used in this receiver, is a Raula d-Lyric, and it is used as a straight audio transformer. The second transformer, T-6, is of the same make, but it is not used in the same way. The latter is used as an auto-transformer with the windings

inverted. That is, the two windings are first connected in series aiding and then the secondary winding is connected in the plate circuit and is used as primary, and the two windings in series aiding are connected in the grid circuit, and this enlarged winding is used as the secondary. To be specific, B and F are connected together and the junction connected to the plate of the tube. Then G is connected to the positive of the plate battery and P is conneceted to the grid of the second tube. This method of connecting puts a very high impedance in the load of the tube and therefore straightens out the dynamic characteristic of the tube and at the same time it makes the primary voltage high. The stepup, however, is slight, but it is better than if the secondary alone were as a choke coil.

The blocking condenser, C-7, has a capacity of 1 mfd. The grid leak, R-2, has a resistance of 250,000 ohms. The by-pass condenser, C-8, across the B battery, is of the same size as the blocking condenser, C-7.

J-1 is a jack for listening in on the first stage of audio. The volume at this point is sufficient for loud-speaker operation on all local and a good many distant stations, but the tube is a C-299, and this, of course, is not able to handle all that is required for a cone type of speaker without overloading. The last tube is a UX-120, which can handle enough, provided a sufficiently high-plate voltage is used. J-2 is an automatic filament control jack for tapping in on the output of the last tube.

R-4 is a master rheostat handling the current for all the tubes. A voltmeter V, connected across the filament line above the rheostat, is a convenient aid in adjusting the filament terminal voltage to the proper value. In series with the master rheostat and with the filaments of the first two intermediate frequency tubes is a second rheostat, R-3. This is mainly used to control the volume of the output of the receiver. Rheostat R-3 may be used for this purpose without producing distortion because the tubes handle intermediate frequency currents, and the signal level in both of these tubes is very low. The master rheostat, however, should never be used for this purpose, for any attempt to reduce volume by reducing the current as a whole will result in serious distortion, particularly in the two audio frequency tubes.

All the tubes in the receiver, with the exception of the last, are C-299 and the last is a UX-120.

The plate voltage on the last tube is 135 volts normally, on the next to the last it is ninety volts and on the remaining tubes it is forty-five volts. Provision has been made so that tubes having dif-

(Continued on page nine)

Additional Radio News Will Be Found in Another Section of Taday's Herald Tribune

### Inductance, Capacity and Resistance the Three "Graces" of Radio

### Author Gives Rules for Selecting Coils for a Given Purpose and Defines Characteristics

By BORIS S. NAIMARK

TN EVERY radio circuit are found three the current to flow, thus opposing it. fundamental electrical properties-inductance, capacity and resistance. They are the three "graces" of the radio

Each of these properties has its uses, applications and functions. However, despite the fact that all these properties are simultaneously employed in every circuit,

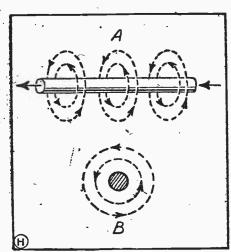


Fig. 1 (a) Showing how a current of electricity in passing through a conductor produces a field of magnetic force. (b) Cross section of a.

it has been found that often for greatest efficiency each of these properties must be confined to separate portions of cir-

Thus inductance coils have a greater efficiency when a minimum of capacity and resistance is found in them. For the same reason condensers, representing lumped capacities, should have a minimum of resistance, and resistances should be non-inductive.

But what is the meaning of the terms "inductance," "capacity" and "resistance"?

#### **Definitions**

Probably you do already know just what each of these terms stands for. However, for the benefit of the ever-growing army of radio novices it will not be amiss here to define the terms referred to above.

Resistance is the inherent property of all bodies to offer a certain amount of opposition to a flow of electric currents through them.

Capacity is the inherent property of all conductive surfaces separated by dielectrics or non-conductors to contain or store amounts of electrical energy when voltages are applied to them.

The definition of "inductance" is not so easy as that of capacity and resistance, and the reader will have to stretch his imagination a bit to understand it. As you probably know, every conductor of an | of a circuit which becomes apparent when electric current exhibits magnetic properties—that is, it has lines of magnetic force are caused to flow through it. Due to surrounding it (see Fig. 1), and just like the common magnet exhibits polarity when the conductor is made to assume the form

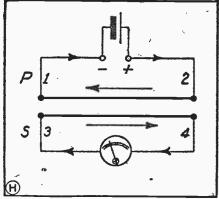


Fig. 3. When a source of current is connected to the primary terminals a current is induced in the secondary which deflects the needle of a measurina device

of a coil (see Fig. 2). When currents in a circuit are changed either in intensity or direction changes in the surrounding magnetic field result. These changes in the magnetic field produce in the circuit that they are associated with voltages

This property of an electric circuit whereby it opposes changes in the current flow is very similar to the property of mechanical inertia and is termed selfinductance or inductance, the unit of it being the henry, sometimes referred to as the international henry. A "microhenry" is 1,100,000 of a henry.

As described above, changes in the current flow of a circuit are always accompanied by changes in the electro-magnetic field. The changes in the intensity of the latter are in turn capable of inducing or setting up currents in adjoining circuits. It is upon this principle that a transformer works. (See Fig. 3.)

### Importance of Inductance Coils

Inductance coils or inductances are employed in every radio station receiving or transmitting, and therefore a thorough understanding of factors that make for efficiency of such inductances is of importance to every amateur.

It may be said that for greatest efficiency an inductance coil must have a minimum of high-frequency resistance. This may sound simple, yet the complexity of the subject will reveal itself at once when one considers the many variable factors that enter into and determine the value of high-frequency resistance of coils. The direct current, ohmic, resistance is only one of the factors; the other major contributing factors are skin effect, distributed capacity, dielectric

losses and eddy current losses. For a small value of high-frequency resistance the value of each of the contributing factors must be kept at a minimum. This, to a certain extent, has been

I fairly large diameter with spaced turns of | has a cross-section area of 10,381 circular fairly thick wire (No. 18 or so), on a high quality dielectric tubing (or, even better, a self-supporting coil of similar characteristics) would be the most desirable.

When a maximum inductance per given length is desired a single layer coil with no spacing between turns except that allowed by the thickness of insulation and of such relative dimensions that its diameter is as nearly as possible 2.46 times greater than the axial length of the windings will be ideal. (Fig. 5.) A tuned radio-frequency transformer secondary possessing these characteristics can be obtained by winding forty-one turns of No. 20 double silk covered wire on a tube three and onehalf inches in diameter; to cover the broadcast range it will have to be tuned by a .0005 mfd. (500 mmfd.) variable con-

Eight to twelve turns of the same wire, on the same tubing, wound in the same direction and spaced one-fourth inch from the secondary, will be a suitable primary.

When the strength of the magnetic field of a coil is the most important factor single layer solenoids of small diameters will be found to be best. Similarly, a minimum of external field is had when the binocular, doughnut and thoroidal coils are used; these coils as a rule, however, possess a high resistance to inductance

What coil is best?

The answer to this question will depend upon one's conception of the meaning of the word "best." It is at once apparent that as long as there are no universally accepted means of valuation there is room for differences in opinion.

The best coil in your case may be de

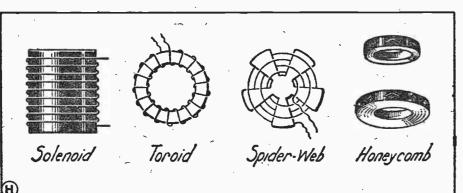


Fig. 4. 'A few of the many of medern radio inductances

accomplished in some of the better low-! loss coils that sport the radio market. The expression "high-frequency re-

sistance" is an exact statement of fact, inasmuch as it means just what the words "high," "frequency" and "resistance" denote. It is that resistance currents alternating at high frequencies various electrical phenomena, this .highfrequency resistance is greater than the direct current, ohmic, resistance of the same circuit. The ratio of high-frequency to direct current resistance of a circuit is known as its resistance ratio. As explained above, direct current resistance is only a contributing factor to the value of high-frequency resistance. The presence of excessive resistance in a radio circuit manifests itself by a broadness of tuning and a lack of sensitivity and volume.

It must be said at this point that the value of high-frequency resistance of coils varies with the frequency of currents that pass through them and is greatest when the frequency is greatest. This is one reason why often broadcast receivers are less efficient at the lower wave lengths, which, as you know, correspond to the higher fre-

Inductance coils are wound in a variety of shapes and forms (see Fig. 4), each one possessing various characteristics, desirable or otherwise.

It is naturally an advantage for one to be able to select the proper type of coil

for a given purpose. When a minimum of high frequency resistance is necessary and plenty of space is termined only after you shall have decided just what is going to be your criterion of judgment.

So far two technical standards of comparison have been proposed. They are: - 1 Ratio of inductance to length of wire

2. Ratio of reactance of a coil to its resistance. In both standards the higher the ratio the better the coil.

By these standards the single layer solenoids which are so common in radio apparatus have an edge over all other coils. These coils are not only simplest to wind, but are also easiest to design to have predetermined values of inductance, and when built along sound low-loss lines are, to be preferred for use by the amateur and experimenter.

True, single layer solenoids possess quite large external fields; interstage coupling, however, may be completely eliminated by proper placing of the coils of the receiver and by partial or total shielding.

### Wire Gauges

Copper is most commonly employed in the winding of inductance coils. This wire is manufactured in certain standard sizes that are usually denoted according to the Brown & Sharpe (B. & S.) gauge, some times called the A. W. G. or American wire gauge.

A table of resistances of soft or annealed copper wire arranged according to B. & S. gauge at once reveals three very Important facts:

1. Wire grows smaller in-diameter and cross-section area as the number representing it becomes greater. That is, No

20 wire is thinner than No. 10 wire. 2. Every third gauge number halves the opposite in direction to those that caused at one's disposal a single layer coil of a cross-section of wire. Thus, No. 10 wire

mils; No. 13 wire has a cross-section area of 5,178.4 circular mils; No. 16 gauge wire has a cross-section area of 2.582.9 circular mils and so on. 3. Every third gauge number doubles

the direct current, ohmic, resistance of wire. Thus, 1,000 feet of No. 10 wire have an approximate resistance of 1 ohm; 1.000 feet of No. 13 wire have an approxi-

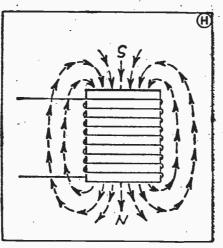


Fig. 2. A coiled conductor exhibits polarity by virtue of surrounding

mate resistance of 2 ohms; 1,000 feet of No. 16 wire have an approximate resistance of 4 ohms, and so on.

It is apparent, then, that the smaller the wire gauge number the smaller the d. c. resistance of that wire; wire thicker than No. 16, however, is seldom to be used in winding inductances, as further advantages gained through an increase in the diameter of wire would be in a large measure offset by an increased value of high frequency resistance que to increased oddy current losses and other causes.

The inductance value of a coil depends, among other things, upon its axial length (Fig. 5), its mean diameter, number of turns per inch and total number of turns, material of the core.

With reference to the material of the core it must be said that air and nonmagnetic materials result in a minimum of inductance, while magnetic material cores result in a greater inductance with a given coil, the material being obtained when an iron core is employed.

Non-magnetic cores, of which the most common is air, are to be preferred in all circuits where high frequency resistance is to be at a minimum and sharpness of tuning at a maximum; to be more specific, in all radio-frequency circuits. In audiofrequency circuits where resonance is by no means desirable and a maximum transfer of energy from the primary to the secondary of audio-frequency transformers is essential an iron-steel core is necessary.

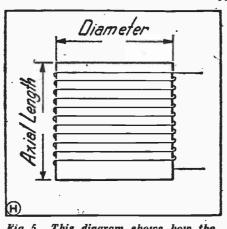


Fig 5. This diagram shows how the diameter and axis length of a coil are measured

if undistorted amplification is to be obtained.

It is most appropriate at this point to warn the reader that although efficient inductances are essential for proper operation, there are many other factors that are essential if ideal results are to be gotten from a receiver.

To obtain ideal results use: (a) Low loss parts, (b) standard tubes throughout and a power tube or two five-volt tubes in parallel in the last stage of audio; (c) a

(Continued on page nine)

### News and Notes of the Radio Trade

At N. Y. Radio Ball The New York City radio stations

New Receiver Announced

are co-operating with the Executive Radio Council of the second district to make a success of the first annual The Chas. Freshman Company, of radio ball, which is scheduled to take New York City, manufacturers of place in the grand ballroom of the Freshman Masterpiece radio receiv-Hotel Pennsylvania on the evening of ers, have just announced a new addi-May 19. The management of station | tion to this line. It is a console | tion for the quarter ended March 31 | Any number of illustrations of this | Institute of Electrical Engineering WEAF has accepted the invitation to model, made of fine selected five-ply was \$95,951. The expenses during point are cited by radio service men. recently. occupy a box and the station and genuine mahogany. The set is equip- the same period, including provision who have the opportunity of ob- Radio broadcasting stations send studio staff will attend in person, ac- in the console there is ample room leaving a net profit of \$55,058.61 be- set in different places. There is the cording to an announcement by for all batteries, chargers, elimina- fore providing for amortization of experience of a resident of a Bronx stead of on a single wave length; re-George T. Droste, president of the tors or any other necessary accessory patents. council. WEAF in turn is inviting apparatus. Leon L. Adelman, of the Chas. all its regular performers to attend. Freshman Company, in making the and it is expected that a large numannouncement of the manufacturer of her will appear. the new console model, made he fol-

Phillips Carlin, Leslie Joy, Ralph Wentworth, Arnold Morgan, Betty Lutz. Mathilda Harding and Kathleen Stewart are among the well known figures who will represent WEAF. Graham McNamee, unfortunately, will not be able to attend, due to the fact that he will not be in New York at

Radio Entertainers

To Meet Listeners

In addition to WEAF, the list of broadcasters sending their leading cost of accessories. In competing broadcasters sending their leading cost of accessories. In competing staff members and visiting artists to with a large number of radio firms the effect new includes WMCA. When a large number of radio firms the effect new includes with a large number of radio firms the effect new includes with a large number of radio firms the effect new includes with a large number of radio firms the effect new includes with a large number of radio firms the effect new includes with a large number of radio firms the effect new includes with a large number of radio firms the effect new includes with a large number of radio firms the effect new includes with a large number of radio firms the effect new includes with a large number of radio firms the effect new includes with a large number of radio firms the effect new includes with a large number of radio firms the effect new includes with a large number of radio firms the effect new includes with a large number of radio firms the effect new includes with a large number of radio firms the effect new includes with a large number of radio firms the effect new includes with a large number of radio firms the effect new includes with a large number of radio firms the effect new includes with a large number of radio firms the effect new includes with a large number of radio firms the effect new includes with a large number of radio firms the effect new includes with a large number of radio firms the effect new includes with a large number of radio firms the effect new includes with the radio firms t WGBS and WRNY, with letters of acceptance monmentarily expected from

Nelson, popular announcer, and W. M. Gilliam the station director, while the WGBS box will be attended by Terese Rose Nagel, well known interviewer and women's program director: Flovd Neale, chief announcer, and many WGBS performers whose names are familiar to the radio audience. Dr. Charles D. Isaacson, impresario of WRNY, will head a group of WRNY artists.

The radio hall is the first social gathering attempted in the field of broadcasting, and will be open to the public. It will afford radio listeners an unusual opportunity to meet their microphone favorites face to face. There will be dancing to music furnished by George Olsen and by at least three other crack orchestras of national fame.

Elizabeth Rethberg, Lopez and Others in Atlantic City Event

During the third week of May the annual convention of the National Electric Light Association will be said to be three tubes in one in point held in Atlantic City, and in of effectiveness, David L. Loewe has this connection Wednesday evening arrived at the Hotel Pennsylvania, will be observed as "Public Policy New York, from Berlin for confer-Night." An entertainment program ences with American radio interests. and brief addresses will be broadcast Dollar Pier, Atlantic City. This radio Audion Company and Loewe-Radio Eastern Daylight Saving Time and in this tube may revolutionize radio. addition to WEAF it is expected that many of the stations usually linked with the New York transmitter will broadcast this same program.

The program will open with selections by Vincent Lopez and his orchestra, augmented to thirty musicians, who have been given special Corporation, that the new tube is not ing," "There's One in Every Office" rehearsals especially for this broad-only a wonderful detector, but an and "Mr. and Mrs." casting program. Following the open-extraordinary amplifier, and its use ing selection by Vincent Lopez and will permit of the most compact sets, Silvertown Orchestra Under his orchestra, Elizabeth Rethberg, yet bring in long distance reception dramatic soprano of the Metropolitan
Opera Company, will be heard in a
vocal solo, to be followed by a brief

radio debut when he will be featured during the Eveready Hour on Tuesday evening. This Everady Hour on terests of the women of America.

Miss Radio will be the guest of the women of the guest of the guest of the guest of the women of the guest of the g WTAG, WGN and WSAI beginning at will be held the week of September 9 o'clock, Eastern daylight saving 13 at Madison Square Garden. Applitime. Mr. Hopper has been heard on the air before, but only as a speaker should be forwarded to G. Clayton interested in tuning in to these time. Mr. Hopper has been heard on cations for entries in the contest at a banquet, and his appearance Irwin, 1475 Broadway, New York City. weekly novel French lessons by Dr. during the Eveready Hour marks the first time that he has ever occupied a place in a definite broadcasting pro-

Appointed Advertising Director | the Hazeltine Corporation at its Irving Levie has joined the staff of meeting on April 29. The dividend A. Davega, Inc., well known sport is payable on May 24 to stockholders shop and radio dealers, as advertis- of record at the close of business May 4. The company owns the patis that the particular location in "wave traps" and "filter circuits," ents and trademarks covering neu- which a receiver is used has a detrodyne inventions of Professor L cided influence on its overall per- Professor Leo J. Peters, of the Uni-

> Corporation. The gross income of the corpora- unsatisfactory nature.

#### Appointed Production Manager

Mr. Herbert E. Mills has been appointed production manager at the new plant of the Amplion Corporalowing interesting comments on the tion of America, the internationally reasons for the growth of the com- known manufacturers of Amplion for the summer, taking the set with From mathematical studies of the "Back only two years ago, in 1924, Amplion Corporation has been an he tuned in forty-six stations, the to signals and interference, Professor when the Freshman Company started American assembly plant for the furthest in Denver, Col. The man Peters concluded that a telephone its operations in the radio industry, parent Amplion concern in England, thought he had revived the receiver transmitting station which broadthey were faced with a serious prob- but due to the tremendously in- merely by installing a new set of casts music at 300 meters has most lem in economics. The average radio creased American demand the Am- batteries, so he brought it back to of its energy confined to wave

receiver employing five tubes which years. performs excellently. The popularity of the set coupled with tremen-

#### New Machine Perfected

this company has recently perfected proximity of the station; but it abor WFBH. layers of paper .0005 and tinfoil .00025 of an inch thick, which represents

The condensers are in extensive use

To introduce a new tube which i Mr. Loewe, who is head of the Radiofrequenz Company, Loews the noted cartoonist, as he will speak Bronx heard practically nothing of before WEAF's microphone to-morprogram will begin at 10 o'clock Company of Germany, claims that row evening at 8:25 o'clock. His sub-

> Mr. Loewe is a brother of Dr. Siegmund Loewe, former chief engineer regularly throughout the country and of the Telefunken Company. Dr. he is one of the best known cartoon-Loewe is noted as a scientist and in- ists of the day. His name is brought ventor here as well as abroad.

dous demand enabled the manufact

"In 1925, this company again sur

five-tube receiver complete with a

1926 model which is the console de-

To Introduce German Tube

scribed above."

urer to retail the set for \$50.00.

receiver, at that time, sold for applion Corporation has decided to the city as an experiment. Here it lengths of 298.5 to 301.5 meters. He proximately \$150, exclusive of the manufacture here as well.

that there was a decided tendency units.

class-who could ill afford to pay the cum, the Rolls-Royce and Pennhard almost unbelievable experience of has most of its energy spread over "To satisfy the demand for a mod- the United States he was associated five-tube receiver in an office on the discovered. erate-priced receiver, the Freshman with the Edison Company and Wes- twenty-first floor of a skyscraper on Professor Peters concluded that if Masterpiece receiving set was devel- tinghouse, and was active as assist- Columbus Circle, from the windows it were possible for a receiver to be oped and placed on the market in ant to the factory and production of which the aerials of WJZ, WGBS built which picked up energy only. 1924. The Masterpiece is a simplified manager of Brandes, Inc., for three and WFBH were plainly visible. (This from a wave length of 300 meters

Joseph, Kucera, president of the

Radio Production Machinery Company, announces a new machine which prised the trade and public by placing on the market a vastly improved and put on the market-a by-pass condenser winding machine. It winds built-in loud speaker for the same price, namely \$60. While these receivers were having a tremendous about one-tenth the thickness of the sale, the officials and engineering average human hair. staff of the company planned their

B eliminators and power sets.

"Cartoons and Buffoons"

By Clare Briggs To-morrow the freak they could only shrug their Those who have laughed at the shoulders and answer, "location." cartoons of Clare Briggs, of the Herald Tribune, and secured almost dead spots in and about New York. "a laugh for a look" as far as these have been concerned, will have the lyn WHN and WNYC are almost unopportunity of hearing the voice of known, while for a long time the east WGBS and WRNY.

ject will be "Cartoons and Buffons." The cartoons of Mr. Briggs appear to mind at once by cartoons forming Mr. Loewe told Mr. J. D. R. Freed, the series under such subcaptions as president of Freed-Eisemann Radio "Ain't It a Glad and Glorious Feel-

special student tourists reduced rates and chartered ocean steamers making available student trips to Europe series and chartered ocean steamers making 1122 Myrtle Avenue, Brooklyn, N. Y. share was voted by the directors of wide following during that time.

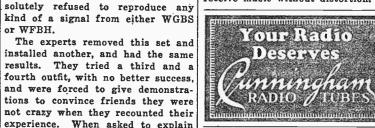
#### **Location Affects** Static Cannot Be Performance of | Eliminated in Our Radio Receivers Reception System

One highly pertinent but little ap-Radio fans cannot eliminate statio preciated fact about radio reception absolutely by the ordinary devices of A. Hazeltine as well as 80 per cent formance. This phenomenon is re- versity of Wisconsin College of Enof the capital stock of the Latour sponsible for many cases of freak gineering, told the meeting of the reception, of both satisfactory and Great Lakes section of the American

ped with a built-in loud speaker and for Federal taxes, was \$40,892.39, serving the actions of one make of energy on a band of wave lengths inapartment house who possesses a ceiving sets cannot receive signals sensitive super-heterodyne of the except by their circuits passing a semi-portable type. In his apartment band of wave lengths, and since he was never able to hear any static and other sources of interferstations further than Newark, no ence are to be thought of as transmatter how delicately he turned the mitting stations sending out energy dials or how late he stayed up. He on all wave lengths, static cannot be

loud speakers. Up to this time the him, and the first night he listened in behavior or radio receiving systems that were already entrenched in the books at present, and is laying a the whole colony with music from and operating at a wave length of public's mind, this company observed plan for the daily production of 2,500 stations in Chicago and all points 300 meters has most of its energy amongst manufacturers to overlook Mr. Mills received his technical Some locations are peculiarly dead 300.1 meters. An exceptionally good that large field of buyers—the middle training at the London Polytechnionly to certain stations. There is the spark station operating at 300 meters & Levassor plants in England. In two radio technicians who installed a wave lengths of 285 to 315 meters, he

was before the first two stations this receiver would be of no value moved their transmitters.) The out- in picking up music from a stafit in question, a tried and depend- tion operating at 300 meters. The reable one, brought in WJZ so loudly ceiving set, he found, must respond the loud speaker almost cracked, as to all wave lengths between 295.5 might be expected considering the meters and 301.5 meters, in order to



GREAT IMPROVEMENT ON SUPERHETERODYNE In certain locations in south Brook-

### Radio Exchange

Rate. 40 cents a line. Ads. accepted until 12 o'clock PHONE PENNSYLVANIA 4000

Parts and Equipment

Silvertown Orchestra Under

Joseph Knecht on Thursday
The Goodrich Silvertown Cord Orchestra, under the musical direction

Chestra, under the musical direction

Market Ma

retail.

ROMCO STORAGE BATTERY CO.,

146 W. 68TH ST. TRAFALGAR 5826

Wanted

Parts and Equipment

BATTERIES OF CHARACTER The New See Jay "B" battery POW Opera Company, will be heard in a vocal solo, to be followed by a brief address by Martin J. Insull, chairs and condition. This tube contains condition of the public policy committee and condition. This tube declars the declars

CHARLES W. DOWN Super-Heterodyne Specialists 711 8th Av. Pennsylvania 7770

Declares Dividend

A quarterly dividend of 25 cents a share was voted by the directors of wide following during that time.

ROMCO STORAGE BATTERY CO.

146 W. 68TH ST. TRAFALGAR 5826

Wanted

Wanted

Wanted

Wanted

RADIO wanted. Complete. First class out locals. Distance getter. List \$60.00.

Tribune.

ROMCO STORAGE BATTERY CO.

148 W. 68TH ST. TRAFALGAR 5826

Evaluation of the cabinet, bakelite panel, Erla condensers, Jos. W. Jones transformers, Cutler-Hammer rheostats, Sickle coils, successful in cutting out locals. Distance getter. List \$60.00.

OUR PRICE, \$24.50. EDZIN, 320 West and condition. TR 125, figrald Tribune.

### For Sets Found in **Short Wave Contest**

The first public announcement from the Board of Judges, now engaged in considering the merits of the various short wave receivers entered for the \$500 prize contest be-Ing held here as a part of the Radio Broadcast-Eveready short wave experiments, indicates that many novel while the present-day transformer- chokes. With resistance control, store for small sums, a man can asateur contestants. While most experimenters submitted designs differing only in minor details from conventional regenerative receivers, a fail to pass various deep notes of impedance amplifier will prove both humber of radically new designs, in- bass instruments regularly featured simple and inexpensive to build at the start with the necessary tools volving principles never heretofore used in home built broadcast or short wave receivers, are being subjected to rigid tests in order to determine their merits.

One receiver which shows considerable promise uses a bridge method of detection, which divides the energy ordinarily radiated by the antenna system in such a manner that it does not affect that circuit. It must be remembered that in the reception of continuous wave signals, the detector circuit must be in an oscillating condition in order to heterodyne the distant signal and, as a consequence, ordinary methods of neutralization used in broadcast reception, are of no avail. One of the most important conditions of the contest is that receivers be of the non-raddating type—a condition which is not met by any of the short wave receivers now in general use.

Another novel departure is embodied in a number of receivers submitted, employing double detection, most favorable grid and plate poten- standing the necessity of using an- pressure, there will be a substantial five-and-ten sells a dandy for a dime. tial of efficient operation, without, other tube to boost volume and a increase in volume as well as imat the same time, causing radiation higher plate voltage. The demand is proved tone. through the antenna system.

Data is now being collected. through extended measuring tests and standard transformer amplifier to energy radiated by the receiver in the large influx of breadcast enthu- windings. broadcasting stations obtaining their are each 500,000 ohms. programs through a short wave link To control volume the center grid are, of course, retransmitted when resistance should be variable. A non- for radio set wiring is hardened copthe program is rebroadcast on long inductive 500,000-ohm Centralab per wire coated with a very thin waves. The use of non-radiating re- modulator is suggested. Resistance layer of solder, which makes it conceivers, which have been developed control is preferable because the venient for ready soldering. It is not Helen Keller to Introduce through the contest, is therefore a surges of current caused when jack necessary to scrape the surface, excontribution of considerable interest circuits are opened and closed are a cept to remove superficial dirt, in both to the short wave and broad- source of danger to the windings of preparing this material for the solde easting art. It is recalled 'hat the the chokes. These currents frequently ing operation. practical development of regenerative

listeners. Included in the board of judges are Professor Louis A. Hazeltine, inventer of the neutrodyne system of reception; Boyd Phelps, radio writer and well known amateur; Arthur H Lynch, former editor of "Radio Broadcast"; G. C. Furness, manager of radio division National Carbon Company; Dr. Lawrence Dunn, district superin tendent of the American Radio Relay League: Edgar H. Felix, radio writer: Dr. A. Hoyt Taylor, in charge of the Naval Research Laboratories at Anacostia, and Professor John H. Morecroft, of Columbia University. It is expected that the prize win-

receivers was accomplished by

amateur rather than professional de-

signers, and consequently their re

markable work with short wave de-

sign is meriting widespread interest

and attention among radio engineers

short wave enthusiasts and broadcast

mers will be announced within mirty

Match Dials to Condensers Dials of various kinds intended for attachment to the shafts of condensers, movable coils and rheostats are made in both clockwise and counter-clockwise models. Carefully examine your own instruments, determine the direction in which they must be turned to effect an increase in adjustment and purchase your dials accordingly.

### Many New Designs How to Build an Impedance Amplifier From Old Apparatus

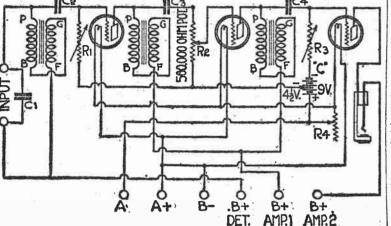
The Reproduction From the Average Set May Be Improved by Making Slight Changes in the Circuit and Adding a Few Parts

By L. S. Hillegas

coupled audio amplifiers deliver ample volume and are electrically effi- be obtained. cient for a given frequency, many

a whisper to maximum loudness may

By using this plan a satisfactory in broadcast programs. Most notes There will be an immediate improve- he will find the construction of combelow 100 cycles are amplified imper- ment in tone quality, and with 201A plex sets a good deal easier than it fectly if they come through at all. will have approximately the same Because of their superiority in this amplification as two transformer respect resistance and impedance stages. If the new "hi-mu" type of the items contained in it he will be



for quality and full rounded tones.

by practical operation, in order to choke coupling, utilizing old parts, is determine the performance of the suggested by engineers of the Central nections because they connect with various qualifying receivers under Radio Laboratories, Milwaukee. From nections because they connect with conditions actually encountered in the accompanying diagram it will be such a labyrinth of buried pipes, but tents. short wave reception. Careful measurements are being made of the and an additional one have their prian oscillating condition, and there series forming three chokes. It is the house main frequently acts as an quite evident, but a few things might is every likelihood that several de- entirely possible to use the sec- insulator between the two, and may need explanation. A hammer, for insigns will be published which over- ondaries alone in case three trans- seriously affect the usefulness of the stance, may seem superfluous since come radiation on short waves. While formers with their primaries burned pipes in the upper floors as radio nails are never used in radio sets, amateurs are not yet troubled by the out are available. Tapping the coil grounds. A simple length of wire but it is very necessary in denting radiating receiver problem, it is im- as is done with commercial auto linking the sides of the meter and panels with the aid of the center portant that non-radiating receiver transformers is not essential for held in place by regular pipe ground punch to provide starting places for designs for short wave reception be good results, and because of the dif- clamps will remove the instrument as the drill. The square is essential for developed. Indeed this is one of the ficulty it is not recommended that an an electrical obstacle. primal purposes of the contest. With attempt be made to cut into the If the house is a small private one

siasts into the new short wave field, The by-pass condenser C1 has a from the cellar, it is a good idea to apprehension is felt that short wave capacity of .001 mfd.; C2 and C3 are run a length of No. 14 rubber covered broadcasting channels will be made not critical in capacity. They may wire directly to the street side of the useless, sooner or later, because of be from 0.1 to 1 mdf., but C4 must meter. The actual length of the wire the appearance of squealing receivers be kept small—say from .001 to .00025 can be as much as fifty feet. This in that territory, unless non-radiat- mfd.—as a larger one, although it arrangement provides probably the ing short wave receivers are de- makes for more volume, will tend to best obtainable "ground" connection. veloped. Any squeals within range of block. The three grid resistances

coupled amplifiers are proving pop- | tubes are used, however, particularly medium. Cost, \$2.

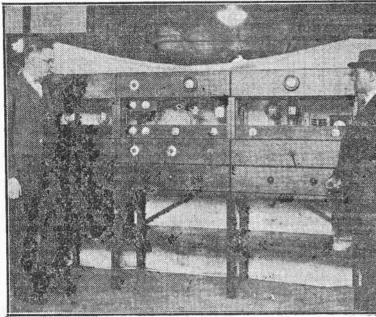
A scheme to readily convert a Poor "Ground" Result of.

Insulated Water Meter maries and secondaries connected in meter coupling the street feeder to

and the radio set is in a room not far panel; do not depend on a mere

**Busbar Already Tinned** The round and square "busbar" sold

### Crystal Controlled Radio Relay Station



Above is shown the new high-power crystal-controlled radio transmitter, which has recently been installed in the Westinghouse Electric and Manufacturing Company's works, at Newark, N. J., and which will be used to maintain telegraph communication with East Pittsburgh on forty-seven meters. The crystal-controlled feature makes a variation from the assigned wave-length impossible and thereby greatly reduces heterodyne interference,

### Few Tools Needed For Construction Of Radio Outfits

One of the things that makes radio such an alluring hobby is the fact that it calls for neither a complicated array of mechanical tools nor an extensive knowledge of mechanical processes. With a few simple hand It is generally recognized that | cause burn-outs in transformers and tools, obtainable in any hardware furthermore, any desired volume from semble and wire any kind of a radio receiver, from little one-bulb affairs to ten-tube giants.

If the new radio fan equips himself appears. The following list is a representative one, and if he obtains prepared for any kind of a circuit:

Hand drill, with chuck to accommodate drills up to 1/4 inch, and set of steel twist drills; convenient packages of common radio sizes are available. Approximate cost, \$4.50. Electric soldering iron, roll of solder, can of soldering paste.

Portable bench vise, three-inch jaws; the kind that can be clamped to the kitchen table or the edge of a Hacksaw, with package of blades. \$1.

Pliers, one pair round nose, one pair flat nose with side cutters, and one pair wire side cutters. Highly important tools; buy good ones. Cost, \$2.75.

Screwdrivers, one very small, two permitting the maintenance of the ular among set builders, notwith- with from 120 to 135 volts B battery Ball-pene hammer, all metal. The

> Six-inch carpenter's square. Cost, Three files; one round, one flat, one three-cornered. Cost. 50 cents. Strong jackknife. Cost, 50 cents.

of insulation and the cleaning o

end of wire in preparation for solder-

ing. The scissors are very useful in

the trimming of loose and frayed

International Good Will Day. Dur-

ing this program, which will begin at

6:45, the radio audience will hear a

talk by Helen Keller and Mrs. W.

Mrs. Peabody is a prominent leader

among women of America and is the

editor of "Every Land," a magazine

cially for girls and boys. Her radio

message is particularly designed to

appeal to children and she will make

her radio statements in story form.

Probably the feature of the program

will be the introduction by Mrs. Pea-

body of Miss Helen A. Keller, who

Undoubtedly there are thousands

Story of My Life," "The World :

Live In" and "Out of the Darkness."

She is a member of many commissions

having charge of institutions and

work among those afflicted with

will also speak for a few moments.

of world friendship published espe-

Peabody.

the set in general.-R. H.

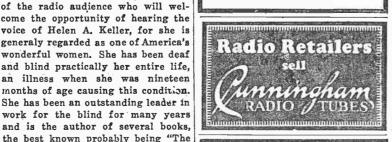
Small pair scissors. Cost. 10 cents. Steel center punch. Cost. 10 cents. Long, stiff-haired brush. Cost, 10

the accurate drawing of lines at exactly right angles to the edge of a The knife is used in the skinning 79 Cortlandt St.

TRYMO. 9 West B'way.

DIALS SOCKETS

are recommended for the circuit described by William M. Henderson, at all dealers or



Have You Seen This Magazine's

If your loud speaker sounds like Cohen on the telephone ...do this!

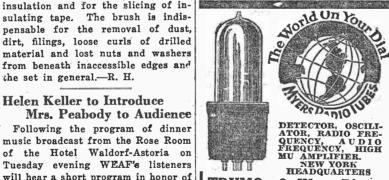
You know the old record, "No, this is not Lieutenant Cohen, it's your tenant Cohen." Distortion made this joke. But it's no joke to have to eternally. strain to make out what an announcer is saying. Get an Acme "double free-edge cone" loud speaker and your megaphone days are over.

## UNLIMITED QUANTITY **Brightson**



Every Tube in Original Box and Guaranteed Perfect. Mail Orders Filled for 6 or More City Radio Co.

110 West 42d St.



American Hard Rubber Co. 11 Mercer St., New York Do not accept substitutes for RADIO

Radio Exchange?

### More Than 500 Attend Convention of the Radio Manufacturers' Association

Seven Co-operating Organizations Also Hold Annual Meetings in Atlantic City

By EVERETT M. WALKER

HE Radio Manufacturers' Associa- in securing the highest possible price for tion had a delegation of more than 500 members and guests at the Hotel Ambassador during its second annual convention at Atlantic City May 10

The convention was officially opened by Herbert H. Frost, now past president of the organization, at 10 o'clock Monday morning. Mr. Frost briefly touched on the activities of the organization during the preceding year. He stated that the industry had reached the lowest point on the curve, and it followed that any industry at this point must take one of two roads—disintegration or stabilization. Mr. Frost was presented with a key to the city by a representative of the Mayor.

their marketable products.

The National Radio Trade Association held a meeting Monday afternoon at which were discussed various ways and means for determining credit. The meeting involved a number of discussions and a number of credit associations presented their method of doing business.

Monday evening in the Japanese room of the Ambassador the Radio Week Committee held its first meeting during the convention. Strenuous opposition to the international radio week, voiced by delegates from the Pacific Coast, succeeded in sidetracking the efforts of the exponents of the international tests to choose a date for 1927 broadcasting events.

tests will be successful.

"The basis for that belief is the establishment of so-called super-power stations in leading centers of broadcasting on the Continent and in the British Isles.

"Another assurance is the certainty of the cordial co-operation of an official European body which has the desire and the power to function properly in arranging the tests in all aspects, in the light of arranging proper programs, as well as attending to the many technical details."

Hold Second Meeting

Unable to reach an agreement as to whether or not another radio week should be held next winter, the radio week committee held a second gathering Tuesday evening. It was decided, after a long delay, that another series of international | in the commercial world.

experts believe that the next international | a message read before the convention that the government stands ready to do what properly may be done to encourage the development of radio.

> The text of President Coolidge's message, which was addressed to Major Herbert H. Frost, past president of the association, is as follows: "My Dear Major Frost:

"Please give my greetings and best wishes to those present at the joint convention of the radio industry in Atlantic

"This is a most important event. The invention and development of radio have been one of the most wonderful incidents of the advance of civilization. Its possibilities for entertainment and education are already known in part. But we are just beginning to realize its full meaning



Group of delegates at the convention of the Radio Manufacturers' Association, Atlantic Cit y, N. J., May 10

Following the opening remarks officers of the various organizations, including the National Association of Broadcasters, the Radio Magazine Publishers' Association, the Radio Week Committee, the Radio Writers' Association, the National Radio Farm Council, the National Radio Trade 'Association and the Federated Radio Trades Association, all of which were holding joint sessions with the Radio Manufacturers' Association, gave brief reports

of their activities during the last year. Paul B. Klugh, executive chairman of the National Association of Broadcasters, urged better programs for the radio listener, and stated that a number of prominent manufacturers had contributed a great deal to the improvement of current programs. It was brought out in his talk that manufacturers must contribute industry progressive; that manufacturers cannot expect to gather all the cream from the cow without feeding it.

Magazines Influence Buyers

R. W. De Mott, president of the Radio Magazine Publishers' Association, told of the tremendous influence radio magazines have on radio buyers, and stated that the combined circulation of radio magazines is 2,052,000.

Dr. E. A. White, director National Committee on Relation of Electricity to Agriculture, addressed the convention on the subject "Magnitude of the Farm Radio Market."

"Within the space of a few short years radio has won a place for itself on the American farm," stated Dr. White. "The reports as to the number of farm families enjoying this service vary, but in any case it is great enough to demand serious attention from radio equipment manufacturers. Yet when we take the most optimistic estimate it appears that there are 5,717,032 farms without radio. This is ten times the number already equipped."

Dr. White told how extremely important radio is to farmers. It enables them to know market conditions and aids them

The fight against international tests was a carry-over from the battle against the 1926 tests, which took place at the fourth annual radio conference, held in Washington last fall.

Oppose Radio Week Tests

The radio broadcasters west of the Misissippi have always opposed international radio week tests. Their contention is that it is impossible for Western fans to hear European stations, due to their remoteness from the east coast, the time difference and the various barriers of mountains and deserts which lie between them and Europe. In view of these facts they objected to giving up an hour of broadcasting each evening for a week for the benefit of Eastern stations and lis-

Ernest Ingold, president of the Pacific burden of the West in its fight against Eastern advocates of international tests.

Powell Crosley jr., chairman of the committee, suggested that if tests were to be held next winter they take place during December instead of January, the month selected for the tests in previous

Radio should appoint an "ambassador" to Europe, was the advice that Eric H. Palmer, well known writer, expressed in an address to the Radio Week Committee.

The function of the "ambassador," declared Mr. Palmer, is to guarantee the success of the preparations for the next international broadcast tests by working in advance of the dates set for the transoceanic experiments, to the end that the program will be of the highest interest and appeal and that all the principal European stations will participate.

Last minute preparations, lack of effort abroad, principally because volunteer representatives of the American commit tee were not supplied with funds to carry on their activities and many other reasons were given by Mr. Palmer to explain the failure of the tests in January, 1926.

"Everything but smallpox seemed to ntervene," he stated. "Atmospheric conditions were frightful most of the week, and the chances are very much against repetition of that barrier in the future." In part, Mr. Palmer said: "European

of three days. It had not yet been decided, however, during what time of the year the tests will take place, but it is expected this information will be forthcoming in the

tests would be held this winter for a period

Tuesday morning the Radio Manufacturers' Association called to order its second general session in the Venetian Room of the hotel at 10 o'clock.

L. H. D. Wells, who addressed the convention on the subject of "The Economics of Distribution," stated that the sensational character of the radio industry, price cutting, dishonest advertising and "gyp" dealers, has done much to retard swift progress. The speaker advocated better programs, more stations connected together in chain and fewer stations in the larger metropolitan districts.

A humorous and practical talk on radio retailing was delivered by J. W. Griffin, of New York City. Mr. Griffin told how the radio dealer operates and described in full the relation of the dealer to the consumer.

Resolutions extolling the feat of Commander Richard E. Byrd in his flight over the North Pole, were adopted during the Tuesday morning general session of the Manufacturers' Association. The resolution was submitted by Eric H. Palmer, who called attention to the close link existing between radio and explorations and expeditions of every description into new territory. The resolution follows:

Palmer's Resolution

"Whereas, This conference of representatives of the radio industry is held coincident in time and interest with an exploit that does highest honor to the American people and particularly to the United States Navy, and whereas, radio has become so vastly important a contributing factor to the success of expeditions of research and exploration and gives additional protection to the daring and courageous men involved in these hazardous explorations and more investigations, and also makes known to the world, almost instantly, just what has been accomplished.

"Therefore, Be it resolved that the convention tender its heartiest congratulations to Lieutenant Commander Richard E. Byrd on the inspiring success of his polar flight and express the hope and conviction that radio may extend its usefulness to the science in the days to come, to the general benefit of mankind."

President Coolidge told the delegates in derelopments.

"This government stands ready to do what may be done to encourage the development of radio. To you who have the privilege of being connected with this formative period of a great art as well as a great industry I extend my congratula-

tions. Yours very truly, "CALVIN COOLIDGE."

Paul B. Klugh, executive chairman of the National Association of Broadcasters. told the members of the press Wednesday morning that 81 per cent of the radio programs in the United States are controlled by the National Society of Composers, Authors and Publishers, and that his association hopes to make an agreement with the latter society in the near future so that radio listeners will have full benefit of all the available musical entertainment.

#### **New Officers Elected**

Election of officers of the Radio Manufacturers' Association took place Wedneslows: A. T. Haugh, of Buffalo, president; Carl D. Boyd, of Chicago, first vice-president; H. H. Eby, of Philadelphia, second vice-president; Leonard Parker, of Chicago, third vice-president; L. G. Baldwin. of Cleveland, secretary; P. C. Lenz, of Chicago, treasurer. R. W. Ruark is exec-

utive secretary of the association. The new board of directors is as follows: Directors at large, Carl Boyd, Powell Crosley jr., Vernon Collomare and E. F. McDonald; directors of the Eastern district, H. H. Eby, C. C. Colby, E. M. Squarey, H. B. Redmond, Godfrey Gort. S. B. Trainor and H. H. Frost; directors of the Western district, Leonard Parker, Towner K. Webster, J. A. Bennan, W. W. Dowell, Harry Bradley, J. V. Hawley, Harry Simpson and D. McGregor.

Hold Annual Dinner

On Wednesday evening, May 12, the second annual dinner of the Radio Manufacturers' Association was held at the hotel, with more than 600 representatives of the industry present. Herbert H. Houston, publisher and member of the American committee of the International Chamber of Commerce, stated that the radio industry was threatened with ruin unless steps were taken to defeat the Dill radio bill governing radio control. Paul B. Klugh was toastmaster.

The balance of the week was consumed with technical discussions relative to radio

### Another Receiver Designed for Use With Improved Amplifier-Battery Eliminator

### This Set Employs Three Dry Cell Tubes in a Neutralized Radio Frequency Circuit

#### By WILLIAM M. HENDERSON

N THE first page of the May 2, in a seven by eighteen inch cabinet. It | between the tuning condensers the two .5- | when the receiver is balanced it is best 1926, issue of the New York Herald Tribune Radio Magazine there appeared an article entitled "An Improved Power Amplifier and Battery Eliminator." by Fulton H. Crawford. The following week a second article by the same author described the construction of a two-tube receiver designed especially for use with the amplifier. These two units when used together made up a four-tube receiver, employing one stage of neutralized tuned radio-frequency amplification, a regenerative detector, one stage of audio-frequency amplification and one stage of power amplification, which could be operated direct from the 110-volt 60-cycle house sup ply without any sacrifice of efficiency. Also, because of the improved design of the amplifier practically distortionless amplification, with any desired amount of volume, could be obtained.

The results described above were obtained by utilizing the battery eliminator, included as part of the amplifier, to supply the plate current for the receiver (this can be done in the case of any set using not more than two r. f. tubes and a detector) and by using 3-volt A. C. tubes in the receiver.

It is the writer's belief that there are many persons desirous of securing the clear reproduction which is obtainable from the power amplifier who do not wish to have a receiver which requires the use of either storage batteries or special tubes. The receiver to be described in this article, therefore, has been designed to answer this requirement. It employs three UV-199 tubes and may be operated at maximum efficiency very economically. When used with the amplifier-pattery eliminator three No. 6 dry cells are the only batteries required. These may be purchased for about one dollar and will last for several months. It can therefore be seen that it would be difficult to construct a receiver which would furnish the same quality of entertainment at less up-

It should also be explained that any one not wishing to buy an A. C. tube and transformer for use in the first stage of the power amplifier may substitute a UX 199 and practically the same results will be obtained. When a UX-199 is used in the amplifier its filament may be heated with the batteries connected with the re-

### Results With Dry Cell Tubes

There may be some doubt in the minds of those readers who are not just looking for quality reproduction, but who also want distance reception, as to the merits of small dry-cell tubes. Let it therefore, be said that the small tubes will give just as good amplification at radio frequencies as the larger storage battery type if the circuit and components are chosen with due consideration, as is the case in this

This receiver, for it is a complete set

will be noticed from the drawings that there are only three dials on the panel which are the three wave length controls. This departure from the usual use of rheostats should not be frowned upon for there is no real necessity of using variable rheostats in series with any amplifier tube that is correctly biased or balanced. In the detector circuit the variable rheostat is not necessary when the grid leak is connected from the grid to the filament rather than in shunt with the grid condenser. The way in which adjustable rheostats are eliminated in this receiver is by the use of an automatic filament control, amperite, in series with the filament of each tube.

#### List of Parts

The following is the list of parts actually selected by the writer and used in the construction of the receiver described:

- 1 Radion panel 7x18x inches.
  1 Radion sub-base panel 7x17x inches.
  3 General instrument 23-plate SLF condensers.
  3 Type No. 6, V 199 Amperite filament controls.
  3 BMS Vernijustor dials.
  3 General Instrument radio-frequency trans-
- 3 Radion type UX-199 sockets.
  3 Lynch metalized grid resistors, value to be determined by experiment.
- 2 --.5 mfd. Tobe by-pass condensers. 3 grid leak mountings.
- o grid leak mountings,
  3 .0005 mfd, fixed condensers,
  1 .004 mfd, condensers,
  1 Binding post strip. On the panel there are mounted three

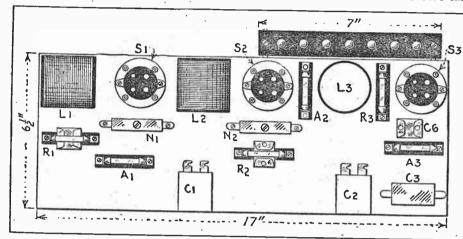
twenty-three plate straight line frequency Condensers of this construction were selected because, in the writer's opinion, they are very much more satisfactory mechanically. The only other apparatus located on the panel is the three vernier dials employed to tune the condensers. In mounting the condensers on the panel care should be taken to see that the shafts are

mfd. condensers are located. The grid resisters, the small .0005-nifd. variable condensers, the automatic filament controls and the balancing condensers are mounted close to the tube which they control, as shown in the drawing.

The R. F. Transformers The radio-frequency transformers sclected for use in this set have been deto stop the tube preceding the detector from oscillating first.

Due to the fact that the 199 type of tube sometimes varies in characteristics, a failure to prevent oscillation will be cured by raising or lowering the value of the grid

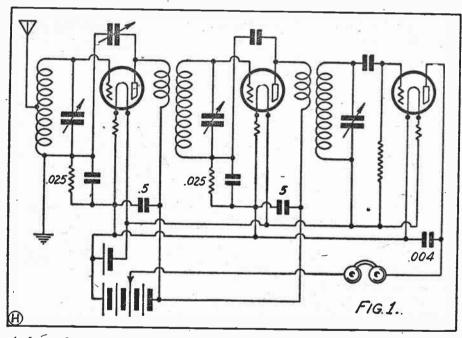
For those who desire to make their own radio-frequency transformers the following data will be of value. Procure three



The above drawing shows how the parts may be arranged on the baseboard

signed especially for use with 199 tubes. and as the other parts of the circuit are intended for use with these transformers, it is wise to either use the one selected or to construct transformers of a similar

The wiring of the receiver would be greatly facilitated if the apparatus mounted on the baseboard is connected before the front panel is attached to the baseboard. The connections between the at least six and a half inches apart. This | coils and condensers, however, cannot be



A three-tube, two-stage tuned radio-frequency receiver designed for use with an

makes it necessary to mount one condenser in the center of the panel and the other two, two and one-half inches from the left it should be remembered that the end of and right hand edges respectively.

The layout of the apparatus on the baseboard of this receiver may be seen from the accompanying diagram. On the near edge of the baseboard directly in back of each of the variable condensers are mounted the three radio-frequency transformers. Centered between these transformers are the vacuum tube sockets, which should be of the small UX199 type. when used with head phone, is mounted | On the front edge of the baseboard panel

nal of the vacuum tube, and the end of the primary coil nearest the secondary connects with the plate of the tube. The soldering lugs on the transformers are so placed as to permit short direct leads when the coils are connected in this manner. However, if the wiring as described above is not followed, poor results are sure to result, and it will probably be

found impossible to prevent oscillations When the set has been wired as shown in the diagram it should first be tested without the power amplifier tube. That is, the phones should be connected in the plate circuit of the detector tube.

made until the receiver is assembled. In

wiring the radio-frequency transformers

the secondary coil furthest away from

the primary connects with the grid termi-

With about seventy volts on the plate of the radio-frequency amplifying tubes, tune in a short wave station and forget the oscillation for the moment. Then adjust the small variable condensers, first the one in the second radio-frequency amplifier tube circuit and then the one in the first stage until the circuit is stable.

As these small condensers do not necessarily have to have the same capacity two and one-half inch lengths of Radion ribbed tubing. This type of coil form gives a semi-air core coil.

On the form wind ten turns of fine wire spaced with a silk thread. This wire may be any size from 30 to 38, and either enamel, cotton or silk covered.

Place a layer of heavy paper over the primary coil and then over the paper, and in the same direction as the primary wind sixty turns of No. 26 double cotton covered copper wire. The coil terminals are connected in the circuit the same as

When the three tubes are operating connect the set to the power amplifier. Knowing from previous experience that the quality from this amplifier, which is well nigh perfect, any slight imperfection in the reproduction can be directly traced to the grid leak in the detector tube.

Changing the resistance value of this leak will clear up the distortion and result in a set that is a pleasure to hear. Additional volume can be obtained by boosting the voltage on the R F tube up to ninety. Under these conditions, however, a "C" battery should be inserted in the circuit. A separate battery should be used for each tube and the battery should be connected directly in the circuit, not outside the

It is generally conceded to be good practice for a trouble shooting paragraph to be added to any article on set construction. Fortunately this set is heir to so few troubles that any small details can be

covered as a "beware of the dog" sign. In the first place, do not the set tunes broadly because the antenna dial does not cut out powerful local stations within three or four degrees on the dial. The antenna is purposely connected conductively to the secondary circuit so that good summer reception of distant stations can be obtained. This connection naturally broadens out the tuning of the first radio frequency amplifier.

Second, any difficulty in balancing may be directly traced to the wrong value of the resisters used, each tube may require a different value. Also the value of the detector leak may be found critical.

If the set is noisy in any way, and the constructor is sure that all the connections are tight and no wires are held by rosin instead of solder, the trouble can be traced to the poor resistance. Resisters of the metalized type are usually most satisfactory for noisless operation.

It will be best to shift the tubes around to find which functions best as detector and which as amplifiers. Such a change may improve results twenty-five or thirty per cent.

Use a small aerial in order to prevent overloading the detector tube when local stations are being received. Overloading this tube results in distortion and this condition would defeat the purpose of the

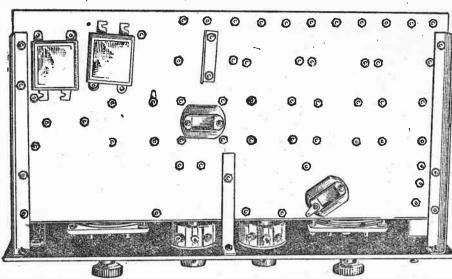
A Compact Eight-Tube "Super-Het"

ferent plate voltages, or tubes having the same plate voltages, but different functions, may be biased independently. Therefore, 1-C post is provided for the last tube, one for the next tube, one for the modulator and one for the rest.

An idea of the panel lay-out is best obtained from a drawing of a photograph of the set taken from the front. This picture shows the voltmeter in the center at top. Directly under the meter are the two rheostats, the volume control R-3 to the left and the master R-4 to the right. The two tuning condensers, of course, are directly back of the two vernier dials. The regeneration control condenser is located on the panel at the extreme left, and its knob and pointer may be seen. Directly under this knob is seen the filament switch S. At the extreme right end of the dial, and symmetrically placed with respect to the switch and knob, are the two output jacks, J-1 and J-2. The layout is well arranged and well balanced.

The interior lay-out may be seen in the drawing of the rear of the set. The two Jacks may be seen at the extreme left of the picture and at the extreme right the midget condenser and the filament switch. The back of the voltmeter is in the center and the two rheostats directly under it. On either side are the two tuning condensers. Next to the panel there is a strip of metal for baseboard. On this metal strip are located the modulator tube to the right and the oscillator tube to the left, with the oscillating coil in between the two tubes. At the extreme right of the metal strip may be seen three | field. This is bound to cause eddy cur-

(Continued from page one)



Practically all of the wiring in this receiver is concealed beneath the baseboard. The brass screws which hold the instruments in place are utilized to bring the wires through the sub-base panel

are marked X on the circuit diagram.

At this point it may be well to state that it would be better if the metal strip were not used. It serves no particular purpose and it does detract from the efficiency of the oscillator coil. As will be seen, the oscillator coil rests on the metal strip with its axis at right angles to the plane of the metal. That is, the metal sheet is at right angles to the magnetic

leads to the loop or tuning coil, which | sheet. A hard rubber or a phenolic strip would be much better.

the extreme left the grid leak for the last tube, then the power tube, the first audio, the detector and the three intermediate frequency amplifiers. Then in the row of transformers is seen the autotransformer, the audio-transformer, the detector grid leak, the intermediate frequency tuned filter and the three iron core intermediate frequency transformers. binding posts. There are for the three | rents of no small magnitude in the metal | In the foreground is the row of binding

posts, marked to correspond with the terminals they represent.

The third drawing shows the bottom view of the baseboard. This shows the locations of the two microfarad condensers to the two .0025 mfd. condensers and the greater part of the wiring.

The filament power is supplied by a battery of twelve No. 6 dry cells connected in series parallel so as to give 4.5 volts. The total filament current is normally .54 ampere. Since there are four banks of No. 6 dry cells in parallel, each cell delivers only .135 ampere, a value which is low enough to insure long and efficient life of the battery.

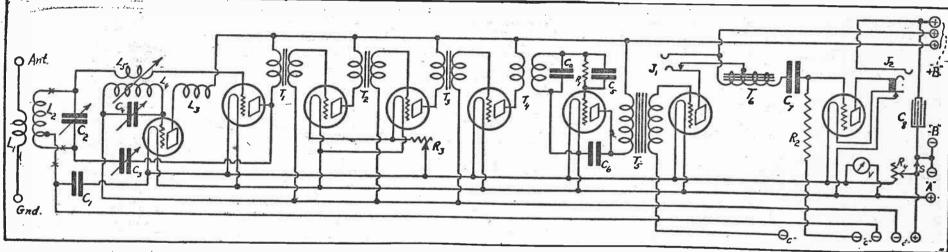
The following is a list of the parts used in the construction. Of course, other makes may be substituted if desired, provided these parts are equally good as those used and are otherwise suitable.

A loop or input transformer, L-1, L-2, An oscillating coil as described. Three General Radio I. F. iron core trans-

General Radio tuned filter transformer. One General Radio tuned filter transformer, 30,000 cycles. Two Rauland-Lyric transformers. Two General Radio tuning condensers, .0005 mfd. each.

Two General Radio tuning condensers, .0005 mfd. each.

Two Marco vernier dials.
One Ambassador midget condenser.
Two Sangamo fixed condensers, .0025 mfd. each.
Two Dubilier fixed condenser, .0025 mfd. each.
One Dubilier fixed condenser, .00025 mfd.
One General Radio 20 ohm rheostat, R-3.
One General Radio 6 ohm rheostat, R-4.
One Turn-it grid leak.
One Daven grid leak with mounting.
One double circuit flament control jack.
One single circuit flament control jack.
One single circuit flament control jack.
One flament switch, C-H.
One Weston voltineter, 0-7.5 and 0-150.
Seven Benjamin sockets for UV-199.
One General Radio socket for UX-120.
Fourteen Eby binding posts.
One 22.5 grid battery.
Twelve No. 6 dry cells.
Three 45 volt plate batteries, preferably large.
One Western Electric cone type speaker.
One Western Electric cone type speaker.



The wiring diagram of the eight-tube super-heterodyne receiver described in this article

### Police to Stop Crime With Radio

on, that would be the signal for the sergeant to tune in and get the word from headquarters.

There is no greater testimony to the value of using radio in criminal cases than that which was offered April 18 last by Gustave Fischer, twenty years old, one of the "cake eater bandits," who pleaded guilty to murder in the second degree and was sentenced to from twenty years to life imprisonment.

Fischer wrote a letter to his former employer, declaring he had pleaded guilty in order to save his companions from the electric chair. He stoutly maintaine that he was innocent of participation in the murder of Angelo Mahairis, a Jamaica restaurant keeper, but said he acted as he did to save the lives of his

#### Fischer's Letter Broadcast Now this letter of Fischer's, intended

obviously to win leniency for him, was promptly put on the radio program. Fischer's former employer was Donald Flamm, proprietor of a printing shop at 250 West Fifty-fourth Street. Mr. Flamm, a believer in the honesty of Fischer, said: "I will always hold a job for Gustave." Station WMCA gave Mr. Flamm permission to broadcast the "cake eater's" letter, and, as may be readily imagined, in a human interest story of that kind, a huge audience listened in.

Had there been any opportunity of winning leniency for Fischer through public opinion, that broadcasting of his letter would have done it. Whether from a morbid interest or otherwise, the public wants its crime news, not in concentrated, homeopathic doses, but enlarged upon, with full details both of the crime and of the persons involved.

It is beside the point to argue that this is or is not a sociological defect. The public wants it, and manages to get what greater radius of reception and sharper of the last audio tube.

(Continued from page five)

it wants. In order to obtain like cooperation from the public on the enforcement side of the law, the Police Department plans to enlist the services of every possible accessory. Notable among these now is radio.

Returning to the "cake eating" bandits, it should be remarked that Fischer's employer invalidated the entire force of the argument in behalf of Fischer, by a concluding remark. After insisting that | New York newspapers recently, by a Fischer was innocent, and after reading the letter in which Fischer said he had done nothing wrong, Mr. Flamm said, according to published reports:

"Gustave was drunk at the time of the murder committed by another-Herbert Koerber. He was drunk and didn't know what was going on. He was only a pawn in the hands of his companions, none of whom was an intimate friend."

A prosecuting attorney might argue that if Fischer was drunk at the time of the murder and did not know what was going on, he was hardly competent to testify as to his part in the crime. It would seem strange, also, that he should be willing to accept a term of life imprisonment to save bandits who were only acquaintances, none of them being an in- | lent in Chicago.

timate friend. His conduct, if the facts were true, would be quite remarkable. Such nobility should be rewarded in some other place than in Sing Sing.

Having to cope with radio employed by or in behalf of bandits, the Police Department must of necessity employ radio in behalf of law and order.

On the side of efficiency, the astounding confessions published in full in all member of the Richard Reese Whittemore gang, shows that crime is well organized and conducted on a national scale. The lengths to which the members of this band will go are attested by the fact that Whittemore has been tried for murder in Buffalo, is awaiting trial for murder in Baltimore, and if he escapes the Maryland law will be tried on a variety of charges in New York City.

The ease with which Whittemore and other bandits get around from city to city, with seeming impunity, calls for action along new lines by the police. While no Eastern city ranks in amount or daring of crime with Chicago, nevertheless few of them can afford to jeer at the display of lawlessness now preva-

### The Three "Graces" of Radio

(Continued from page two)

C battery to obtain proper grid bias at | tuning over the entire broadcast band. every stage of amplification; (d) straight ine wave length or straight line frequency condensers; (e) a variable grid leak; (f) vernier dials and proper voltages on the out distortion. plates of all tubes, not to mention a good aerial and ground.

The detector should be made regenerative to some degree where it will not result in instability, as this will afford a

Use audio amplifiers that will allow as near an approach as possible to straight line amplification, i. e., amplification with-

Unless you can afford to buy the best

do away with jacks. Secure a high quality loud speaker whose nominal impedence matches more or less accurately the output impedence

The murder of an assistant state's attorney, shot down in an automobile by bullets from a machine gun, sounds primitive in brutality if advanced in scientific development. The automobile and machine gun are twentieth century novelties. The cold-blooded killing dates back quite a bit. But before New York points an accusing finger at Chicago, it should be remembered that the Chicago bootlegging band responsible for Mc-Swiggin's murder, not having at hand competent marksmen, had imported gunners from New York, and it is believed the actual murderer was a New York

More of this will be developed during the investigation into McSwiggin's death now being conducted by a blue-blooded grand jury of Chicago bank presidents and financiers. It would not be at all surprising if their verdict contained a recommendation for the Chicago Police Department to re-establish itself on an efficient basis. One of the probable consequences would be the adoption of a municipal broadcasting station, with a receiving set in all police booths and traffic towers.

Should that recommendation be made, undoubtedly the Chicago officials will be visiting New York to observe the workings of radio here. A natural development, too, will be that the two cities eventually will interchange police alarms with municipalities in between.

The next step after that will be a national police radio, connecting San Francisco and Los Angeles with New York. The central clearing house for such national police news, finally, would constitute the point of communication for the foreign centers of the International Police Bureau. The next few weeks should tell whether radio is to become an indispensable adjunct in the solution of important crizte mysteries.

p. m.—Stephen Girara Birthu gram.
 3:45 p. m.—Women's Club Hour.
 6:30 p. m.—Concert Orchestra.

1090k-WHAR-ATLANTIC CITY-275m

versity,
p. m.—Marine Band.
30 p. m.—Royal Salon Orchestra.
0:30 p. m.—Mixed Quartet.
1:30 p. m.—Organ recital.

040k-WGR-BUFFALO-319n

1080k—WHAM—ROCHESTER—278m 1:30 p. m.—Eastman Theater organ. 1:30 p. m.—Student recital. 1:30 p. m.—Book chat. 1:45 p. m.—Program from WFBL. 1:45 p. m.—Scores; market report.

1180k—WMAK—BUFFALO—266m 15-7:15 p. m.—Dinner music. 15 p. m.—Daily news, 980k—WJAR—PROVIDENCE—306m

12 noon—Keith's radio review.
2 p. m.—Earl Cummins's Orchestra.
3:10 p. m.—Musicale.
4 p. m.—Eugene's Singing Orchestra.
6 p. m.—Keith's radio review.
6:45 p. m.—Big Brother Club.
7:30 p. m.—Musicale.
8-11 p. m.—Program same as WEAF.

FRIDAY

610k—WEAF—NEW YORK—492m 3:45-7-7:20 a, m.—"Tower Health Ex

a. m.—Ruth Friedman, planist.
 15 a. m.—New York State Federation of Women's Clubs.
 1:30 a. m.—Ruth Friedman, planist.
 1:40 a. m.—Columbia University lecture.

noon-Market and weather reports.

n. m.—Parnassus String Trio.

p. m.—Marie Minier North, soorano.

p. m.—Marie Miller North, soprano.
p. m.—Talk.
m.—Tea music.
m.—Dinner music.
m.—Gene Ingraham's Orchestra.
p. m.—"Kinney Club Story," Bianche
de. To WEAF.

Wade. To WEAF.

'45 p. m.—"Dickens's Corner."

8 p. m.—The Happiness Boys.

5:30 p. m.—Bessie Dodge, soprano; Mozelle Bennett, violinist; Frances

8 p. m.—The Happiness Boys. 8:30 p. m.—Bessie Dodge, soprano; Mo-zelle Bennett, violinist; Frances Holmes, reader. 9 p. m.—Cities Service Quartet and Or-

chestra.

9:30 p. m —U. S. Marine Band,

10 p. m.—Whittall Anglo Persians.

10:30 p. m.—Ben Bernie's Orchestra from

Hotel Roosevelt.

11 p. m.—Pelham Heath Dance Orches-

660k-WJZ-NEW YORK-455m

ercises."
45 a. m.—Morning prayer services.

b. m.—Dinner music.
b. m.—Jointly with station WEAF.

5:10 p. m.—Dot McLean, Lew Ford, 5:10 p. m.—Dot McLean, Lew Ford, songs.
5:25 p. m.—News and sports.
5:25 p. m.—News and sports.
7:30 p. m.—Isabelle Henderson, soprano.
7:45 p. m.—Health talk, Dr. Percival.
8 p. m.—Will Oakland's Chatheau.
8:30 p. m.—Will Oakland's Chatheau.
9:30 p. m.—Health Von der Haide, pianist.
9:10 p. m.—Boems by N. T. G.
9:20 p. m.—Dick Hughes, ukulele.
9:30 p. m.—Loew's Orchestra.
10 p. m.—Bob Schaefer, songs.
10:15 p. m.—Frances Sper, contralto.
10:30 p. m.—Levery Smith's Orchestra.
11:30 p. m.—Everglades Orchestra.
11:30 p. m.—Everglades Orchestra.
11:30 p. m.—Everglades Orchestra.
12 midnight—Sophie Tucker's playground.
8:70k—WNYC—NEW YORK—526m
5:55 p. m.—"Keeping Fit," Joe Ruddy.
6:05 p. m.—Herman Neuman, pianist.
6:15 p. m.—"Tennyson, Lotus Eaters and Ulysses." 6:30 p. m.—Concert Orchestra.
7 p. m.—Dance orchestra.
7:15 p. m.—Keystone Automobile Club.
8 p. m.—"Good Books," Thomas Masson.
8:15:11 p. m.—Program same as WEAF. 2 p. m.—Seaside Trio. CITY—275m 7:30 p. m.—"Current Topics of the Day." 8 p. m.—Seaside Trio.. 9 p. m.—Studio concert. 11 p. m.—Follies Bergere Dance Orchestra.

6:15 p. m.—"Tennyson, Lotus Eaters and Ulysses."
6:35 p. m.—Jeanette Eberhard, soprano.
6:45 p. m.—Market high spots.
7 p. m.—Vinton Higble, tenor.
7:15 p. m.—"Department of Public Weifare." Bird S. Coler.
7:30 p. m.—Pollee alarms.
7:35 p. m.—Resume of meeting of the Board of Estimate,
8 p. m.—Baseball results.
8:05 p. m.—Barank Lauria, violinist.
8:05 p. m.—Barank Lauria, violinist.
8:30 p. m.—Bar Association address on "The Course of a Criminal Case." William Black.
9:30 p. m.—Gedney's Student Orchestra.
10:10 p. m.—Lecture service.
10:30 p. m.—Police alarms; weather.
11:00k—WFBH—NEW YORK—273m
2 p. m.—Orchestra.

2 p. m.—Orchestra, 3 p. m.—Studio program, 3:30 p. m.—Lou Kenkel, 3:45 p. m.—Bob Cavanaugh, Charles Hef-3:45 p. m.—Bob Cavanaugh, Charles Heffernan, banjos.
4 p. m.—Radioviews, Mrs. Owen Kildare.
4:15 p. m.—Augustus Post, basso.
4:30 p. m.—Eddie Woods.
4:45 p. m.—Marion Doran, soprano; Bernie Pollock, songs; Theo Alban, tenor.
5:30 p. m.—Cozy Club Orchestra.
6 p. m.—Dotty McLean, Leo Ford.
6:15 p. m.—Automobile routes.
6:30 p. m.—Majestic String Ensemble.
7 p. m.—Yorkville Radio Entertainers.
11:30 p. m.—Castillian Royal Orchestra.
11:45 p. m.—Sleepy Hall Orchestra.
880k—WMČA—NEW YORK—341m

889k—WMČA—NEW YORK—341m 10:15 a. m.—Employment opportunities 10:30, 11:30 a. m.—Market reports. 12 noon—Food Bureau program. 12:30 p. m.—Olcott Vail's Ensemble. 1:30 p. m.—Market report (hourly 3:20) 10:30 a. m.—Women's Club talk; q
tet; news.

1 p. m.—Luncheon concert,
4 p. m.—Tex dance,
4:20 p. m.—Vocal selections.
6 p. m.—The Smilers.
6:30 p. m.—Dinner dance.
7:45 p. m.—The Golf Question Box,
8 p. m.—The Golf Question Box,
9 p. m.—Musical program.
10 p. m.—Dance music.
860k—WEEL—BOSTON—349m.
12 noon—Keith's radio review.

tunities.

6 p. m.—Olcott Vall's String Ensemble.

7 p. m.—Hofbrau Haus Entertainers:

7:30 p. m.—Klein's Serenaders.

8 p. m.—Roemer's Homers.

9 p. m.—Nathan Straus Serenaders.

9:30 p. m.—Columbia Park Entertainer.

10:15 p. m.—McAlpin News Editor.

10:30 p. m.—California Ramblers.

11 p. m.—Ernie Golden's Orchestra.

12 midnight.—Broadway Night.

1290k—WOKO—NEW YORK—233m 8 p. m.—Frank Galasri, composer. 6:15 p. m.—American Legion program. 6:35 p. m.—Inwood Post program. 9 p. m.—Nick Seraphine's Serenaders. 10 p. m.—Vanity Orchestra. 1410-WMSG-NEW YORK—213m p. m.—Jimmy Clark's Entertainers. 130 p. m.—Hotsy Totsy Boys. p. m.—Sport talk. 115 p. m.—Castle Royal Orchestra. 115 p. m.—Augustine Jacquillard,

prano. 8:30 p. m.—Willard Robison, "Voice the South." the South."

9 m.—Augustine Jacquillard, soprano
9:15 p. m.—Irene Arrigoni, planist.
9:30 p. m.—Rita Katz, soprano,
9:45 p. m.—Irene Arrigoni, planist.
10:15 p. m.—Carl Smith, tenor.
10:30 p. m.—S. S. Leviathan Orchestra.

10:30 p. m.—S. S. Levisthan Orchestra.
1040k—WLWL—NEW YORK—288m
8:30 p. m.—McEnery's Entertainers.
9 p. m.—Guestion Box.
9:30 p. m.—Florine Instrumental Trio.
9:45 p. m.—Samuel Gilligan, tenor.
10 p. m.—"Books." Walter V. Gavigan.
10:15 p. m.—Chris Tait, cellist.
10:20 p. m.—Florine Instrumental Trio.
10:30 p. m.—Organ recital.
1100k—WBBR—STATEN ISLAND—273m
8 p. m.—George Twarosek, planist. 8 p. m.—George Twaroschk, planist.
8:10 p. m.—Vocal selections: Ruth de
Boer, Elvira Ktefer.
8:20 p. m.—Bible lecture, "Joseph From
Prison to Throne."
8:40 p. m.—Vocal selections.
8:50 p. m.—George Twaroschk, planist.

950k—WAHG—RICHMOND HILL—316m 12 noon—Grebe Matines Trio. 1390k—WRST—BAY SHORE—216m 8-10 p. m.—Musical program.

1140k—WAAM—NEWARK—263m a. m.—Happy hour program. b. m.—Ernie ICfickett's artists. c. m.—Sport talk, Major Tate. 6:45-7:15-7:45 a. m.—Gym class. 2:30 p. m.—Elva Diestelhorst, pianist. 2:45 p. m.—George Little, "New Breeds

estra.

m.—John Bright Orchestra.
p. m.—Clifton's Anglers.
p. m.—The Kandy Kids.
m.—Barry O'Moore, tenor.
p. m.—The Musical Chefs.
p. m.—Comedy talk.
m.—Sesquicentennial Hour.
m.—Parodians' Orchestra.
m.—Madrid Revue.

660k—WJZ—NEW YUKM—400m

1 p. m.—Ambassador Trio.

2 p. m.—Weather; news service.

4:30-5:30-7:30-10:30 p. m.—News.

4-4:35-7:30 p. m.—Baseball scores.

4 p. m.—"Your Daily Menu."

4:15 p. m.—"They Are Wearing".—

4:25 p. m.—"Solving Candy Problems."

4:25 p. m.—Solving Candy Problems."

4:35 p. m.—Astor tea muslc.

5:32 p. m.—Market quotations.

5:35 p. m.—Finacelal summary.

5:40 p. m.—Cotton quotations.

5:50 p. m.—George Olsen's Orchestra. This Country."
m.—Elva Diestelhorst, pianist.
p. m.—Janet Hall, contralto. 7 p. m.—George Olsen's Orchestra. 8 p. m.—Sundial Shoe Serenaders. 8:30 p. m.—Bonnie Laddies. 9 p. m.—Snider's Catsup Hour. 10:30 p. m.—Lorraine Grill Orchestra. 3:45 p. m.—Janet Hall, contraito. 6:15 p. m.—Bill Wathey, "Sports." 6:30 p. m.—Jacques Jacob's Ensemble. 7:20 p. m.—News bulletin. 1430k-WBNY-NEW YORK-210n 1190k-WGCP-NEWARK-252m

30 p. m.—Walt Riggin's Orchestra. 30 p. m.—Walt Riggin's Orchestra. 30 p. m.—Myrtle McMichael, soprand 45 p. m.—Lucy West, planiste. p. m.—James Browning, tenor. 15 p. m.—Ida Laube. organist. 1340k—WODA—PATERSON—224m m.—Knickerbocker Trio. m.—Clifford Odet's dramatic revie 18408—WODA—PATERSON—
2 noon—Dance music; songs,
n. m.—Musicale,
180 p. m.—News; sport talk,
p. m.—Colonial Inn Dance Orch
185 p. m.—Midweek devotional
455 p. m.—Sacred music m.—Al Wilson's Gang.
b. m.—Studio program.
c. m.—Orchestra.

950k-WGBS-NEW YORK-316m 8:15 p. m.—Midweek devotional ser 8:45 p. m.—Sacred music. 9 p. m.—Brighten Serenaders. 9:30 p. m.—Entertainers. 9:50 p. m.—Dance music. 10:30 p. m.—Jill Walsh's Orchestra. 11:30 p. m.—Jimmy Murphy's Owls. 1 a. m.—Silk City Rendezvous. 590k—WOO—PHILADELPHIA—508m 11 a. m.—Grand organ. 12 noon—Luncheon music.

950k—WGBS—NEW YORK—316m
10.a. m.—Timely talks with Terese.
10:10 a. m.—William Bennes, pianist.
10:15 a. m.—Radio Gym Class.—
10:35 a. m.—Fashion talk; pianist.
1:30 p. m.—Scripture reading.
1:35 p. m.—George Junior Republic; Id
Nasi, soprano; Perini Nasu, pianist;
Delia Thompson, violinist.
p. m.—Special program for the public
schools; Charlotte Saulsbury, songs.
2:10 p. m.—"Quest of the Golden Key,"
Minny Ayers.
3 p. m.—Special camping week.
3:30 p. m.—Seifert Pile, basso.
3:40 p. m.—Plano lessons; solos.
6 p. m.—Uncle Geebee. 4:45 p. m.—Grand organ; trumpets 7:30 p. m.—Dinner dance music. 7-30 p. m.—Drinner dance music.
7-60k—WLIT—PHILADELLPHIA—395
12:05 p. m.—Organ recital.
12:29 p. m.—Concert Orchestra.
4:35 p. m.—Artist recital.
5:50 p. m.—Baseball scores.
7:30 p. m.—Dream Daddy.

p. m.—Uncle Geebee.

30 p. m.—S. S. Leviathan student cruise orchestra.

p. m.—"What's Your Radio Problem?"

110 p. m.—S. S. Leviathan student orm.—Dream Daddy. —WIP—PHILADELPHIA—508 chestra. 1100k—WEBJ—NEW YORK—273m p. m.—Luncheon music.
p. m.—Artist recital.
105 p. m.—Concert orchestra.
150 p. m.—Market reports. 1100K-WEBS-NEW 10KM-c/sm 7 p. m.—Lovat Pipe Band. 7:20 p. m.—Anne Ridley, soprano. 7:20 p. m.—Barbara Bruce, soprano. 7:30 p. m.—W. H. Melvin, tenor. 8 p. m.—W. H. Melvin, tenor. 8:20 p. m.—Wil Tiley, comedian. 8:20 p. m.—D. McLean, baritone. 8:30 p. m.—Luna's Knickerbocker chestra. 

Musical Art.

10:05 p. m.—Concert from Institute
Musical Art.

10:05 p. m.—Talk by Colonel Simons.

10:20 p. m.—Nat Martin's Orchestra.

1080k—WCAU—PHILADELPHIA—278m

6:30 p. m.—Billy Hay's Orchestra.

7:30 p. m.—Snellenburg Symphochestra.

p. m.—John p. m.—'Practical
p. m.—'Practical
fred H. Haag,
c. m.—Concert from Institute o chestra.
1250k—WHAP—NEW YORK—240m

Restriction."

9 p. m.—WHAP string sextet.

9 p. m.—Franklin Ford, "Protesta Foundation Stones."

9:30 p. m.—WHAP mixed quartet.

10 p. m.—Dorothy Hoyle, violinist: Vi Milholland, soprano; Lucile Wilk Flanist; Ruth-Montgomery, soprano.

10:45 p. m.—John Erb, organ recital.

30 p. m.—Entertainment.
p. m.—Description of fight Carpenti
vs Eddie Huffman.
1 p. m.—S. S. Leviathan Orchestra. 830k-WHN-NEW YORK-361m

p. m.—Dr. Robert Harrison, taik.
p. m.—Elizabeth Schreckinstein,
Crooning Andy," Prince Piotti, songs.
p. m.—News and sports.
p. m.—News and sports.
p. m.—News and sports.
p. m.—News and sports.
p. m.—Martin S. Adcock, songs.
p. m.—Olga Mantey, songs.
p. m.—Uncle Robert's Pals.
p. m.—Phil Abrahams's Aces.
p. m.—Phil Abrahams's Aces.
p. m.—Uncle Robert's Chat.
p. m.—Uncle Robert's Chat.
p. m.—Hrank Ochs, tenor.
p. m.—Melle Osborne, contraito.
p. m.—Bob Brandes, songs.
p. m.—Loew's Lexington Orchestra.
p. m.—Loew's Lexington Orchestra.
p. m.—Palsades Amusement (chestra. tra.

1000k—WPG—ATLANTIC CITY—300m

2 p. m.—National Electric Light Association Convention.

6:15 p. m.—Sports talk, Billy Rocage
6:45 p. m.—Organ recital.

7 p. m.—Morton dinner music.
7:30 p. m.—Auction bridge game.
9 p. m.—Auction bridge game.
9 p. m.—Traymore Concert Orchestra.
10:20 p. m.—Traymore Dance Orchestra.
11 p. m.—Eddie McKnight's Dance Orchestra.
12 midnight—Midnight Froite. Vincent Lopez's Orchestra.

chestra.

10 p. m.—Roseland Dance Orchestra.

10 p. m.—Strand Dance Orchestra.

11 p. m.—Barn orchestra.

11 p. m.—Barn orchestra.

12 midnight—Dance orchestra.

12 midnight—Dance orchestra.

570k—WNYC—NEW YORK—526m

5:40 p. m.—Herman Neuman, planist.

5:50 p. m.—Herman Neuman, planist.

5:50 p. m.—Market high spots.

6 p. m.—Elementary French lessons.

7 p. m.—Jewish hour, songs and in strungatal music; Stringwood en semble. Lopez's Orchestra.

790k—WGY—SCHENECTADY—380m

12:30 p. m.—Reports.
2 p. m.—Stock reports news; scorss,
6 p. m.—Stock reports news; scorss,
6:50 p. m.—Dinner concert.
7:30 p. m.—WGY Book Chat."
7:45 p. m.—Program from Syracuse Uni
versity.

semble;
p. m.—Baseball results.
05 p. m.—Isidore Franzblau, planist.
30 p. m.—Rudolph Joskowitz, violinist.
p. m.—"The Love Story of Sir Walter

200 p. m.—Elsie Bartschinger, soprano 35 p. m.—Dental Society 58th Annua 135 p. m.—Dental Society 58th Annual Dinner-Meeting.

peakers: Dr. R. Ottolengui, Dr. Louis I. Harris, Dr. William De Kleine, Dr. Arthur G. Smith, Dr. Harvey J. Burkhart, Mrs. G. W. Skinner, Dr. A. C. Fonea, 0.30 p. m.—Police alarms; weather.

980k—WJAR—PROVIDE.
1:05 p. m.—Studio program.
8 p. m.—Hudson-Essex Orchestra.
9 p. m.—Program from WEAF.
630k—WTIC—HARTFORD—476m 5:30 p. m.—"Twenty Minutes in Happy-land."
5:50 p. m.—Bond Trio.
6:35 p. m.—Bond Trio.
6:35 p. m.—Colonial Male Quartet and String Ensemble.
7 p. m.—"Book Reviews", Thomas Mas-

A. C. Fones.
10:30 p. m.—Police alarms; weather.
1160k—WRNY—NEW YORK—258m
11 a. m.—Dr. King's hour.
11:45 a. m.—Electrical talk.
12 noon—Musical Courier says.
12:15 p. m.—Ukulele Bob McDonald.
12:30 p. m.—Pauline McDonald. songs.
12:45 p. m.—Edwin Caplin, tenor.
5:20 p. m.—Temple Emanu-El Friday
Night Service.
7 p. m.—Sport rays.
7:10 p. m.—Commercial Digest.
7:20 p. m.—Sudio artist.
7:20 p. m.—Sudio artist.
7:30 p. m.—Sudio artist.
7:30 p. m.—Alfred W. McCann, "Fooda."
8 p. m.—Grand Opera period.
8:45 p. m.—Grand Opera period.
8:45 p. m.—"Summer Radio," Sylvan
Harris.
9 p. m.—Tuxedo Musical Club. son. 7:15 p. m.—Concert by 102d Infantry Band. 1070k—WNAC—BOSTON—280m 10:30 a. m.—Women's Club talk; quar-9 p. m.—Tuxedo Musical Club. 9:45 p. m.—George D'Andria and Juliette Morino, barytone and violin. 10:15 p. m.—Novelty, "Broadway Night,"

110th p. m.—Novelty, Broadway Night,
1100k—WFBH—NEW YORK—273m
2 p. m.—Orchestra.
3 p. m.—Studio program.
3:30 p. m.—Fred Fisher, Bob Neilson, songs.
3:45 p. m.—Helen Ryan, violin recital.
4 p. m.—Murray Schwartz, plano.
4:15 p. m.—"The Far East," George S Forman.

4.45 p. m.—'Prince Plotti."

5 p. m.—Val Curtis. Joe Triebitz.

5:15 p. m.—Chris Meehan, tenor.

5:45 p. m.—Michael Simmons, movi chat.

chat.
6 p. m.—Le Roy Montesanto, tenor.
6:15 p. m.—Judge Clarise M. Baright.
6:30 p. m.—Cupid Dance Orchestra.
11:30 p. m.—Connie's Inn Orchestra.
880k—WMCA—NEW YORK—341m
10:15 a. m.—Employment opportunities.
10:30-11:30 a. m.—Market reports.
12:15 p. m.—Department of Agriculture.
12:30 p. m.—Olcott Vail's String Ensemble. m.—Olcott Vail's String Ensemble,
p. m.—Ernie Golden's Orchestra,
p. m.—Ernie Golden's Orchestra,
p. m.—Sach's Quality Boys,
m.—Woodmansten Inn Orchestra,

7:30 p. m.—Sach's Quality Boys.

8 p. m.—Woodmansten Inn Orchestra.

8:30 p. m.—Cousin's shoe style talk.

8:50 p. m.—Broadway Association.

9 p. m.—Hardman Hour of Muşic;
Gaston's Salon Orchestra; Joseph
Honti, planist; Betty Francis, soprano;
Cccile Ardon, impersonations.

10:15 p. m.—McAlpin news editor.

11 p. m.—Musical program.

12 p. m.—McAlpin Entertainers. 950k-WAHG-RICHMOND HILL-316n

950k—WAHG—RICHMOND HILL—316m
12 noon—Musical program.
7:30 p. nr.—Edna Bockstein, pianist.
8 p. nr.—Gordon B. Nevin, organist.
9 p. nr.—Walter Leary, barytone.
9:15 p. nr.—Helen De Witt, Jacobs, violinist.
9:30 p. nr.—Walter Leary, barytone.
9:45 p. nr.—Javva Blix, contraito.
10 p. nr.—Shell Beach Dus.
10:20 p. nr.—Harry Ash's Orchestra.
11:02 p. nr.—Harry Ash's Orchestra.
740k—WOR.—NEWARK—405m

740k-WOR-NEWARK-405m
6:45-7-15-7:45-a. m.-Gym class.
2:30 p. m.-S. S. Windrow, "Ukulele Swede."
2:45 p. m.-Julius Seebach, barytone.
3 p. m.-S. S. Windrow. 3:15 p. m Marvin Clark's Aces of Ha mony. 6:15 p. m.—Bill Wathey, "Sports." 6:30 p. m.—News bulletin. 6:40 p. m.—Bretton Hall String Quartet 1140k-WAAM-NEWARK-263m

1140k—WAAM—NEWARK—2008 10:30 a. m.—Happy Hour program. 11:30 a. m.—Happy Hour program. 4 p. m.—Orchestra. 3 p. m.—Orchestra. f p. m.—Sport Talk, Major Tate. 1:15 p. m.—Shark River Joy Boys. 5:15 p. m.—Talk, "Rheumatic Neuritis." 5:15 p. m.—Chamber of Commerce Oranges. 9:15 p. m.—Cydne Vida, soprano. 9:30 p. m.—Charles McMurray, tenor. 10 p. m.—Wallie Osborne's Orchestra.

p. m.—Walle Countries of Action 1190k—WGCP—NEWARK—252m p. m.—Alice Laurie, soprano; Blan Darvo, uke and songs. 45 p. m.—Silvertone Trio. p. m.—E. Stark Campbell Quartet. 1230k—WGBB—FREEPORT—244m 8.45 p. m.—Premier Concert Band.
9:15 p. m.—Premier Concert Band.
9:15 p. m.—Hazel Rogers, soprano.
9:30 p. m.—Lesser's Nite Owls.
10:30 p. m.—Newkirk's Troubadours.
11:30 p. m.—Eisenhuth's Lynbrooklyns.
1390k—WRST—BAY SHORE—216m
7-7:45 p. m.—Jack Watson's Theater Orchestra.

cnestra. 8-10 p. m.—Dance music. 1340k—WODA—PATERSON—224m 1340k—WODA—PATERSON—224m

2 noon—Dance music.

12:30 p. m.—Concert selections.

5 p. m.—Entertainment.

5 p. m.—Entertainment.

6 p. m.—Frankie Pope's Music.

8:30 p. m.—Church choir.

9 p. m.—Pompton Lakes Bulletin.

9:30 p. m.—Albert Terhune, talk.

9:45 p. m.—Concert planist; soprano.

10:30 p. m.—The Bom Bom Buddies.

11:30 p. m.—Clifford Lodge Frolic.

760k—WLIT—PHILADELPHIA—395m

12:05 p. m.—Organ recital.

760k—WLIT—PHILADELPHIA—395m
12:05 p. m.—Organ recital.
12:20 p. m.—Religious service; orchestra.
2 p. m.—Concert orchestra.
2 p. m.—Concert orchestra.
2:30 p. m.—Playlet.
4:35 p. m.—Artist recital.
5:50 p. m.—Baseball scores; sports.
7:30 p. m.—Dream Daddy.
8:10 p. m.—Talk by Henry Hotz.
9:30 p. m.—Schickerling Artists.
10 p. m.—Arcadia Dance Orchestra.
10:30 p. m.—Rufus and Rastus.
11 p. m.—Freshiman Radio Hour.
12 midnight—Musical comedy and theatrical all-star program.

ology."

9 p. m.—Henry Schlosberg, violin recital.

9:20 p. m.—Mandolin, guitar and banjos.

9:30 p. m.—Paula Fuchs, pianist; Wayside Troubadors.

10:10 p. m.—Prince Piotti, comedian.

10:20 p. m.—Samuel Wasserman, violinist

p. m.—Luncheon music.
3 p. m.—Lecture by Dr. Joseph Saylor,
5,05 p. m.—Dinner music.
7 p. m.—Bedtime story; roll call; birthday list; popular selections. 590k-WOO-PHILADELPHIA-KOR-

:45 p. m.—"Realty Training," S. Homer Smith. Smith.

8 p. m.—WOO String Trio.

9 p. m.—"Cities Service Quartette a:
Orchestra."

9:25 p. m.—Theater Studio program.
10:30 p. m.—Whittall Anglo Persians.
10:30 p. m.—Dance Music.

760k—WFI—PHILADELPHIA—395m

1 p. m.—Tea room ensemble.

1 p. m.—Tea room ensemble.

3 p. m.—Studio program.

6:30 p. m.—Concert orchestra.

7 p. m.—Dance orchestra. 1080k-WCAU-PHILADELPHIA-278m 6:45 p. m.—Clarence Seaman's Orchestra 7:15 p. m.—Peter Rabbit and the kiddles 7:30 p. m.—Snellenburg Instrumenta

8 p. m.—"Administration of Kendrick."
8:15 p. m.—Enrico Aresoni, tenor.
8:30 p. m.—The Singing Groundhog.
9 p. m.—The Reginas.
9:15 p. m.—Dwight Strickland, "poeticlan."
10 p. m.—Harmony songs.
10 in.—Harmony songs.
10:30 p. m.—Jack Myers's Dance Or chestra.

1090k:—WPG—ATLANTIC CITY—300m

1:30 p. m.—Morton luncheon music.

1:30 p. m.—Afternoon tea music.

1:45 p. m.—Organ recital.

7 p. m.—Traymore dinner music.

7:30 p. m.—Eliks' Home dinner music.

8 p. m.—Educational series.

8:15 p. m.—Graduation exercises, nurses' training school.

9:30 p. m.—Ambassador Concert Orchestra.

10 p. m.—Traymore Grill Dance Orchestra.

10:30 p. m.—Organ recital. 10:00k—WHAR—ATLANTIC CITY—275m

1000k—WHAR—ATLANTIC CITY—275m
2 p. m.—Seaside Trio.
7:30 p. m.—Lecture period,
8 p. m.—Seaside Trio.
790k—WGY—SCHENECTADY—380m
12:30 p. m.—Market report.
2 p. m.—Asia Orchestra.
2:30 p. m.—Music; "Health Notes."
6 p. m.—Stock reports; news; scores.
6:30 p. m.—International Sunday school lesson.

lesson.
7 p. m.—Van Curier Orchestra.
7:30 p. m.—Health talk.
7:35 p. m.—Health talk.
7:35 p. m.—French by Radio."
8:15 p. m.—French by Radio."
8:15 p. m.—Remington Typewriter Bi
10:30 p. m.—WGY Orchestra; Gertr
Smith, contraito.
940k—WGR—BUFFALO—319m
6:30 p. m.—Dinner music. 8:30 p. m.—Dinner music.
7:30 p. m.—Kinney Club story.
8 p. m.—Audubon Terrace Meadow Larks.
8:30 p. m.—Edna Rhoda, Edith Spencer. Harmony Team, 5 p. m.—"Reforestation," Henry Bishof. chof.

p. m.—Winger's Entertainers.

p. m.—Bernice Riggs, planist.

p. m.—Jointly with WEAF.

130 p. m.—The Catalano Boys.

1 p. m.—Vincent Lopez's Dance Or
chestrs.

chestra. 1130k—WMAK—BUFFALO—266m 7:30-9—Musicale. 7:30-9—Musicale.
9-10 p. m.—Musical program.
1030k—WHAM—ROCHESTER—28m
4:30 p. m.—Eastman Theater
5 p. m.—Student recital.
8:10 p. m.—Forecast; market report.
8:15 p. m.—Remington Band.
10:30 p. m.—WGY Orchestra.
10:45 p. m.—Ochobach Dance Orchestr
980k—WJAR—PROVIDENCE—308m
1:05 p. m.—Odward and Harris.

hestra. 630k—WTIC—HARTFORD—476m 11 a. m.—Travelers Orchestra. 5:30 p. m.—Hub Trio. 7:15 p. m.—High School Choir and Or

130 a. m.—Luncheon Concert.
p. m.—Luncheon Concert.
p. m.—Tea Dance.
4:20 p. m.—Vocal and piano
6 p. m.—Kiddles Klub.

Nigner Dance.

mission.

8 p. m.—The Kitchen Kanaries.

8:30 p. m.—Mr. and Mrs. Radio Skit.

9 p. m.—Concert program.

9:30 p. m.—Varied program by artists.

10:30 p. m.—Dance music; popular selections. ctions. 860k—WEEI—BOSTON—349m noon—Keith's Radio Review. 2 noon—Keith's Radio Review. 2:45 p. m.—Market report. 3:15 p. m.—George Joy, Nell Canto

115 p. m.—George 2007, songs.

p. m.—Musicale.

3 p. m.—Keith's Radio Review.

3:20 p. m.—Joe.Rines' Orchestra.

6:45 p. m.—Big Brother Club.

7:30 p. m.—Whiting's Entertainers.

8 p. m.—Garden talk.

8:30 p. m.—Sandy MacFarlane.

9 p. m.—From New York. 130 p. m.—Musicale. ... 0 p. m.—Whittall Anglo Persians p. m.-Ed Andrews's Orchestre

:45 p. m.—Farm flashes.
p. m.—St. Mark's colored male quartet.
p. m.—Veterans of Foreign Wars.
p. m.—Burbank "Chocolateers," Hotel Brunswick studio. 10:30 p. m.—Brunswick orchestra.

**SATURDAY** 

1160k—WRNY—NEW YORK—258m

11 a. m.—Voice and violin ensemble.

11 a. f. a. m.—Mental hygiene advice,

12 noon—Organ recital.

6:45 p. m.—Fiction, Marcey Wahren.

7 p. m.—Sport rays,

7:10 p. m.—Scudio theater index.

7:15 p. m.—Radio theater index.

7:20 p. m.—Studio artist.

7:30 p. m.—Orlando's Concert Orchestra.

8 p. m.—O'Keefe and Breen, musicale.

8:15 p. m.—Ben Bernie's Orchestra.

9 p. m.—Drawing-Room Players.

9:30 p. m.—Schulman's National Stage Children's Association.

10 p. m.—Isabelle Austin's Musicale.

10:30 p. m.—Popular songs.

11 p. m.—Amicl Musical Organization.

1-2 a. m.—DX Hound Hour.

950k—WGBS—NEW YORK—316m

10 a. m.—Kiddie Klub program.

10:10 a. m.—Kiddie Klub program.

10:40 a. m.—Lillian Mendetz, recitations;

fashion talk.

1:30 p. m.—Scripture reading. 1160k-WRNY-NEW YORK-258m fashion talk. 1:30 p. m.—Scripture reading. 1:35 p. m.—'Radio Wave Tales.'' 1:45 p. m.—'Vladimir Tobachnick, bary-1:45 p. m.—Vladimir Tobachnick, ba tone; Alice Harper, soprano. 2:30 p. m.—Special camping program, 3-4 p. m.—New York Association for 7 p. m.—Gluseppe Leone, barytone.
7:10 p. m.—Sorey Concert Trio.
7:30 p. m.—Black's "Outline of Travels."
7:30 p. m.—Pike's Orchestra.
8:45 p. m.—Clifford Cheasley, "Numerology."

660k—WJZ—NEW YORK—455m

1 p. m.—Knickerbocker Orchestra.

2 p. m.—Weather; news.

4:30, 5:30, 7:30, 10:30 p. m.—News.

4:30, 5:30 p. m.—Baseball scores.

4:30 p. m.—Lorraine Orchestra.

5:32 p. m.—Market quotations.

5:33 p. m.—Financial summary.

5:40 p. m.—Control quotations.

5:50 p. m.—Farm market reports.

7 p. m.—Commodore Concert Orchestra.

8 p. m.—Congressional forum.

10:30 p. m.—Vanderbilt Orchestra. 880k-WMCA-NEW YORK-341m 880k-WMCA-NEW YORK-341m
10:15 a. m.—Employment opportunite
11 a. m.—Bernard Cohen, planist.
11:30 a. m.—Market report.
12:30 p. m.—Dept. of Agriculture.
12:30 p. m.—Dept. of Agriculture.
12:30 p. m.—Employment opportunities.
6 p. m.—Olcott Vail's String Ensemble.
7 p. m.—Tappen's Orchestra.
8:30 p. m.—Musical program.
10 p. m.—Norman Pearce, readings.
10:30 p. m.—Minnie Weil, planist.
11 p. m.—Ernie Golden's Orchestra.
12 p. m.—McAlpin Entertainers.
570k-WNYC-NEW YORK—526m

12 p. m.—McAlpin Entertainers.

570k.—WNYC.—NEW YORK.—526m
7 p. m.—Marie Rossi, soprano.
7:20 p. m.—Piano selections.
7:30 p. m.—Polic selections.
7:35 p. m.—J. Morton Smith, barytone.
8 p. m.—Basebnil results.
8:05 p. m.—Milton Yokeman, tenor.
8:30 p. m.—Krien's Symphony Club. Orchestra of 125 musicians; Edgar Schenkman, violinist; Gladys St. John, soprano. soprano.
10:10 p. m.—Lecture by Hariette Weems
10:30 p. m.—Police alarms; weather. 1100k-WEBH-NEW YORK-273m m.—Bert Lowe's Entertainers.
p. m.—Murray Schwartz, piano.
p. m.—Doris Freedman, songs.
m.—Kismet Dance Orchestra.
m.—Popular Trio
p. m.—Irene Arrigoni, pianist.
p. m.—Ed Berlin's Orchestra.
p. m.—Lawrence Metcalf, Tin Whis-5:30 p. m.-Evercharge Orchestra. m.—Len Saxon, tenor.
p. m.—Bob Schaffer, songs.
p. m.—Davega's golf lessons.
p. m.—Majestic String Ensemble.

7:30 p. m.—Katherine Work, planist.

1410k—WMSG—NEW YORK—213m
6 p. m.—Carl Smith, tenor.
6:15 p. m.—Joe Davis, plano.
6:30 p. m.—Jackie Heller, uke.
6:45 p. m.—Selma Barrett, songs.
7 p. m.—Sport talk.
7:15 p. m.—Vera Bohm, prima donns.
7:30 p. m.—Carlton Boxill, tenor.
7:45 p. m.—Kittridge Glee Club; May
Breen and Peter de Rose and Ukelele
Girls.
8:30 p. m.—Samuel Bernard, timeology.
8:45 p. m.—Armand De Cesare, uke.
9 p. m.—Tracy and Dougherty, songs.
9:15 p. m.—Buth Matlock, soprano.
9:30 p. m.—Armand De Cecare, uke.
9:45 p. m.—Belle Brooks and Jack
Lauria.
1290k—WOKO—NEW YORK—233m

1.290k—WOKO—NEW YORK—233m 8 p. m.—Mildred De Fablis and Mina Canale, piano duets. 8.15 p. m.—Emidio De Fablis, concert violinist. 8:35 p. m.—Emile Fanning, tenor. 8:50 p. m.—Mme. Cecelia Rivero, dramatic soprano.

5:05 p. m.—Carl Smith, tenor.

10 p. m.—Vanity Club Orchestrs 100k-WBBR-STATEN ISLAND-278m 8 p. m.—Charles Rohner, violinist. 8:10 p. m.—Fred Twarosichk, tenor. 8:20 p. m.—Bible questions and answers. 8:45 p. m.—Charles Rohner. 50k-WAHG-RICHMOND HILL-316m

12 noon—International Trio.
1.02 p. m.—Ralph De Stefani's Orches-tra.
12 midnight—Midnight variety program. 1140k-WAAM-NEWARK-263m o. m.-Phil Lynch's Orchestra. o. m.-Sport review, Major Tate. 7 p. m.—Sport review, Major Tate.
7:15 p. m.—Kane and Gildey, songs.
7:30 p. m.—Theodora Goodwin, soprano;
Henrietta Goodwin, cellist.
8 p. m.—Roy Churchill, Bob Rutan, banjoists.
8:40 p. m.—Mary Morgan Cello, pianist.
9 p. m.—Grace Woydich, soprano.
9:20 p. m.—Elite Quartet.
10 p. m.—Ray Nichols's Orchestra.

10 p. m.—Ray Nichols's Orchestra.

740k—WOR—NEWARK—405m
6:45-7:15-7:45 a. m.—Gym class.
2:30 p. m.—Frances Pehl, planist.
2:45 p. m.—Clarence Williams' Trio.
3:15 p. m.—Zit's Casino tea music.
6:15 p. m.—Bill Wathey, "Sports."
6:30 p. m.—Jacques Jacobs's Ensemble.
7:30 p. m.—Var's Collegians.
8 p. m.—Orange Chamber of Commerce.
8:45 p. m.—Copenhagen Quartet.
9:15 p. m.—La Forge-Berumen musicale.
10 p. m.—Anton Flettner, "The Rotor Ship."

3:15 p. m.—Anton Flettner, "The Rotal 10 p. m.—Anton Flettner, "The Rotal 10 p. m.—Van York hour of song.
11 p. m.—News bulletin.
11:05 p. m.—Larry Siry's Orchestra.
11:06 k.—WGCP.—NEWARK—252m
8:30 p. m.—Hilda White Kay, contraito.
8:45 p. m.—Singalliano Violinists.
9:15 p. m.—Dorothy Hollander, pianiste.
9:30 p. m.—Silvertone Trio. 1340k—WODA—PATERSON—224m 12 noon Dance music; songs. 5 p. m.—Studio program. 5:30 p. m.—News; sport talk. 6 p. m.—Diener music.

6 p. m.—Disner music.

590k—WOO—PHILADELPHIA—508m
11 a. m.—Grand organ.
12 noon—Luncheon music.
445 p. m.—Grand organ; trumpets.
7:30 p. m.—Dinner dance music. 590k-WIP-PHILADELPHIA-508m
9:80 a. m.-Raducing acceptance p. m.—Organ recital.
p. m.—Frank Dolge's Serenaders.
105 p. m.—Dinner music.
p. m.—Bedtime Story; sextet.
p. m.—Special musical prograr band, orchestra and glee club.
10:30 p. m.—Dance music.
11:05 p. m.—Organ recital.

760k—PHILADELPHIA—3951

3 p. m.—Dance music.
6:50 p. m.—Market reports.
4 p. m.—Choir of St. Mark's Evangelical
Reformed Church.
6:30 p. m.—Concert orchestra.
7 p. m.—Dance orchestra.
8 p. m.—Musical program.
9 p. m.—Lu Lu Glee Club.
1000k—WPG—ATLANTIC CITY—300m
6:45 p. m.—Organ recital. 8:50 p. m.—Sports talk. 9 p. m.—Traymore Concert Orchestra. 10 p. m.—Dance orchestra. 11 p. m.—Elks Home Dance Orchestra. 1090k—WHAR—ATLANTIC CITY—275m 2 p. m.—Seaside Trio. 7:30 p. m.—L. cture period. 8 p. m.—Seaside Trio. 7:00k—WGY—SCHENECTADY—3801

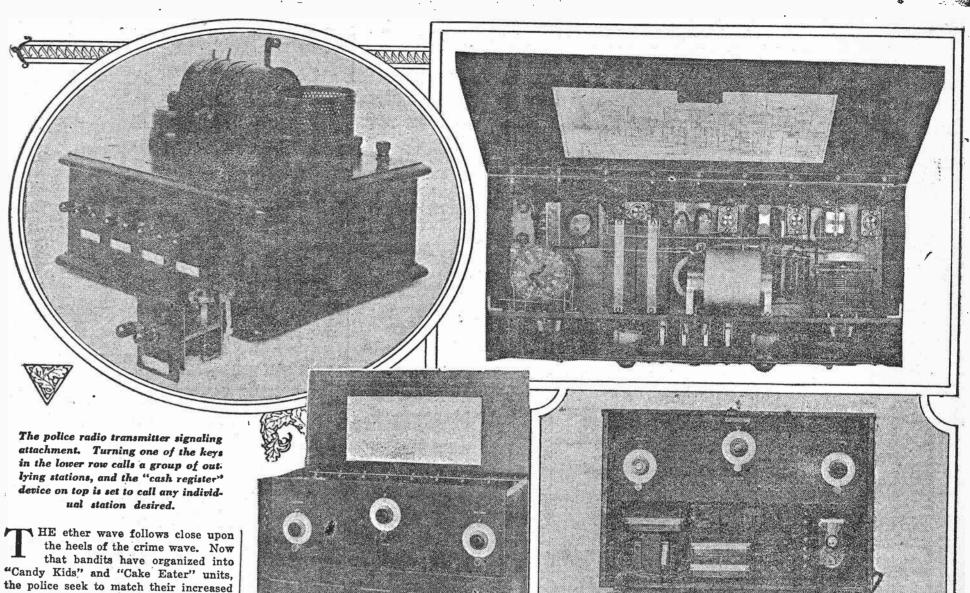
1:30 p. m.—Dance music. 10:80 p. m.—Dance music. 1080k—WHAM—ROCHESTER—278m. 1080k—WHAM—ROCHESTER—278m
4:30 p m.—Eastman Theater Organ.
6 p. m.—Eastman Theater Organ.
7:50 p. m.—Dinner concert.
8:35 p. m.—Forecast; market report.
1130k—WMAK—BUFFALO—266m
6:15-7:15 p. m.—Dinner music.
7:30-10 p. m.—Dinner music.
980k—WJAR—PROVIDENCE—306m
1:05 p. m.—Zikes's Orchestra.
6:30k—WTIC—HARTFORD—476m
5:30 p. m.—"Skinny's Gang"
5:50 p. m.—Sunday School Period. n.—Sunday School Period. o. m.—H. V. Leckie, barytone.

p. m.—H. V. Leckie, barytone, p. m.—Margaret Sheppard, pianist, p. m.—Ukrainian Choir. p. m.—Cleora Miller, contraito. m.—Gladys Slater, trumpeter. p. m.—Henry Kristopher, tenor. p. m.—Carroll's Dance Orchestra.

## How the New York Police Department Plans to Stop Crime With the Aid of Radio

All Towers, Precincts and Other Stations To Be Equipped With Wireless Signal System

By CHARLES ROLAND



Three views of the AC Model police radio received

Police Commissioner George V. McLaughlin will meet Commissioner of Plant ington. The scofflaws were quoting prices and Structures Albert Goldman, for a on Scotch, rye and champagne in reckless conference on ways and means of adminviolation of the law. istering the radio operations. A general

At the approaching conference of Commissioner McLaughlin and Commissioner Goldman the two members of Mayor Walker's cabinet will observe an actual test made of radio as applied to daily police work. On the outcome of that test the future of wireless in the apprehension of criminals will largely rest.

The municipal broadcasting station, WNYC, at the present time issues police

daring with displays of scientific weap-

ons. The New York Police Department proposes to adopt the wireless as part

of its signal system, invoking immediate

Within the next two or three weeks

and simultaneous action on the part of

scheme of arrangement calls for a re-

ceiving set to be placed in every police

station and traffic tower of the city, at

an approximate cost of \$50,000. These

sets have been devised by the Western

Present Police Alarms

alarms at stated intervals, but these do

not cover the entire field by a large mar

gin. They are, in fact, of little more

than experimental interest, for the simple

reason that it is the general public, not

the police, who listen in. With the re-

ceiving sets in the police stations, the

situation would be substantially altered.

Should the proposed innovation be ef-

fected, the Gerald Chapman of the future

would find himself seriously handicapped.

He could not, for example, steal the

Woolworth Building and get away with

it. That is, he couldn't if his theft were

Before he got half way down the block

with his tall load, the message announc-

ing the robbery would be broadcast to

all of the 200-odd police receiving sets.

The patrolmen on duty would be apprised

by the sergeants in the stations, and the

officers in the traffic signal towers would

be on the lookout for a desperate bandit

carting away a fifty-two-story building.

The chances, clearly, are that the struc-

ture would be back in its place before

Of course, at the present rate of crim-

inal progress, it would not be surprising

if the underworld rigged up a counter-

broadcasting station of its own. This

is no idle fancy, for the newspapers re-

legging plant, located in the wilds of

dusk, or dawn, as the case may be.

all branches of the force.

Electric Company.

discovered in time.

Suburban Departments Interested The eyes of the country are on this towns, notably the New Jersey communities, have already communicated with the New York Police Department, asking that they be permitted the right to cooperate. This would involve their installing receiving sets like those proposed for New York, so that from the start the broadcasting of police alarms would reach a metropolitan area of considerable

That represents only a beginning. Police chiefs up state have indicated their desire to co-operate, and the outlook is for wireless unity throughout the state, once the system begins working. A technical description of the proposed

set follows:

For transmission the apparatus includes a selector key (an electro-mechanical device for sending the code call of the particular station which it is desired to signal) and an audio frequency oscillator, which are connected to the radio transmitter of Station WNYC. The system was designed for efficient operation at the transmitting frequency of WNYC. which is 570 kilocycles.

The operation of calling each station resembles that by which a train dispatcher calls the various towermen along ported only last week that a huge boothis telephone line. Levers in a small box on the sending operator's table are set Brooklyn, had set up a broadcasting stato the number of station wanted, and a tion on its roof, operating independently corresponding number of pulses of 3,000of the wave lengths assigned by Washthe radio carrier current like other fre- | switch and green lamp with switch. The quencies in the audible range, and any listener to WNYC's program will hear at intervals a series of high pitched tones which mean that a police alarm is going

The radio receiver is of a comparatively simple type. An unusual feature is that there is no tuning adjustment accessible, as the sets are designed for use at one frequency and all necessary adjustments are made within the set at the time of installation and then locked. Therefore, each receiving station will be in tune with WNYC at all times.

Calling a Station

When in its normal adjustment the regular program from WNYC may be received at any time. But when a signal is to be sent, the other broadcasting must cease. The proper code impulses are then transmitted and the called station. or stations, are summoned by a red light or bell. When the call is answered, the operator disconnects the light and bell by pushing a button. The receiving circuit is arranged for

a 110-volt direct current supply. However, a curcuit for use with an alternating current supply has been developed, and the system may be used with equal efficiency with either.

Apparatus used at the receiving points includes a radio receiver, four vacuum tubes, sensitive relays, a modified form of Western Electric train dispatching selector and a signaling device, either bell or light. One important feature of this set is the use of a relay whose magnetic circuit is made of permalloy, the new alloy recently developed by scientists of the Bell Telephone Laboratories and first used commercially in the New York-Azores cable.

The receiving apparatus is contained in a portable case about the size of an ordinary suitcase. The exterior shows cycle alternating current are sent into only a jark for the plug of the headset

the radio transmitter. Here it modulates cord, a red signal lamp and its associated green lamp is lighted constantly when the power is on to indicate that the set is in order to receive signals.

For the Department of Plants and Structures, the problem of installing and co-ordinating these sets is in the hands of Thomas W. Rochester, electrical engineer. From the Police Department end the operation, presumably, will be in the hands of the Telegraph Bureau, of which Michael R. Brennan is superintendent. Details on this score have not as yet been

In devising the sets the experts have considered in advance all objections that could be raised against radio and have sought to answer them. One of the obiections raised was that police sergeants assigned to listen in for official business might waste their time tuning in on jazz and activities of other stations. Indeed. police, like other officials, being human. it would not be surprising if they did vield occasionally to that curiosity.

### Receivers Tune Only to WNYC

The objection is solved by having the receiving set tuned in on Station WNYC and only on that station. It is not possible to get any other station without radically altering the mechanism of the set. The only unofficial activities that can come over the ether, consequently. would be broadcast from Station WNYC. Since there have been rumors to the effect that the municipal broadcasting station will limit its programs to strictly city affairs, the opportunities for wasting time are lessened.

The objection that a police officer would have to sit with his ear glued to the set also is solved. The green and red lights answer that objection. The fact that the green light is working would indicate at all times that the set is in good condition. When the red light flashes

(Continued on page nine)

## The Herald Tribune Daily Broadcasting Programs for Week Ending May 22

### TO-DAY

- 610k-WEAF-NEW YORK-492m p. m.—Interdenominational Chur-services; address by the Rev. Dan 610k—WEAF—NEW YORK—492m
  8-4 p. m.—Interdenominational Church
  services; address by the Rev. Daniel
  Verway; music by choir.
  4 p. m.—Symphony orchestra.
  4:30-5:30 p. m.—Federation Mixed Quartet.
  6:30 p. m.—Russian Cathedral choir.
  6-7 p. m.—Orchestral concert.
  7-7:20 p. m.—Eugene Musser, pianist.
  7-7:20 p. m.—Capitol Theater Family."
  9:15 p. m.—Atwater Kent half hour; Allen
  McQuhae, tenor and orchestra.
  9:45 p. m.—Sir Gilbert Parker, readings
  from his stories, "Pierre and His Peopie."
- 10 p. m.—To be announced.
- 10 p. m.—To be announced.

  660k—WJZ—NEW YORK—455m

  9 a. m.—Children's hour.

  11 a. m.—West End Presbyterian Church.
  2:30 p. m.—Sunday Radio Forum.
  3:30 p. m.—Manuel Compinsky, violinist.
  3:55 p. m.—St. George's vesper service.
  7 p. m.—Park Avenue Baptist Church Carillon.
  7:20 p. m.—Pennsylvania Concert Orchestra.
  8 p. m.—Bakelite hour; variety program.
  9 p. m.—Commodore Concert Orchestra.
  10 p. m.—Godfrey Ludlow, violinist.
  950k—WGBS—NEW YORK—316m
- pp.,m.—Godfrey Ludlow, violinist.

  950k—WGBS—NEW YORK—316m

  2:30 p. m.—Russian Orthodox Choir.

  8 p. m.—Arrowhead Orchestra.

  4 p. m.—"Little Church Around the Corner"—Devotions; James Helfenstein, choirmaster; Franklin Coates, organist; choral evensong and devotions by choir of boys and men.

  9:30 p. m.—Music-drama, "Mozart," symphonic orchestral and harpsichord accompaniment; Broadway players.

  8:30k—WHN—NEW YORK—361m
- 830k-WHN-NEW YORK-361m 11:30 a. m.—Calvary morning services. 12:30 p. m.—Loew's organ recital. 2-3 p. m.—Queens County Christian En
- deavor.
  3-4:30 p. m.—Radio Bible Class.
  4:30-4:40 p. m.—News and sports.
  5-5:30 p. m.—Roseland Dance Orchestra.
  7:30-9:45 p. m.—Calvary evening services.
  10:45-11:15 p. m.—Janssen's Orchestra.
  12-12:30 a. m.—Sophie Tucker's Play
- ground. ;
  570k—WNYC—NEW YORK—526m
  10:45 a. m.—Communion breakfast, St. Joseph's Council, No. 443, Knights of Columbus. Speakers: Edward T. O'Loughlin, Alexander I. Rorke, Charles A. Harnett, the Rev. Eugene J. Callahan. in, Alexander I. Rorke, Charles A. Harbett, the Rev. Eugene J. Callahan.

  1250k—WHAP—NEW YORK—240m
  2:30 p. m.—Selections from the Bible and Science and Health.

  8:15 p. m.—Concert of sacred music, choir and soloists
  3:45 p. m.—Mary Pinney
- 8:45 p. m.—Mary Pinney, organ recital.

  1430k—BWNY—NEW YORK—210m

  2:30 p. m.—Consuelo Rivero, planist.

  2:45 p. m.—Bamy Breadwinners.

  3 p. m.—Milton Yokeman, tenor.

  3:10 p. m.—Patricia Keller, composer.

  8:20 p. m.—Orchestra.

  4 p. m.—Babe Adler, songs.

  4 p. m.—Babe Adler, songs.

  5 p. m.—Harmonica Trio.

  5 p. m.—Harmonica Trio.

  5:30 p. m.—Harmony String Boys.

  5:30 p. m.—Harmony String Boys.

  6 p. m.—Orchestra.

  1150k—WRNY—NEW YORK—258m
- 6 p. m.—Orchestra.

  1160k—WRNY—NEW YORK—258m
  2:45 p. m.—'Body Fit" talk.
  3 p. m.—Franco's Violin Ensemble.
  8:30 p. m.—Odlerno Quartet.
  4 p. m.—Christian Reisner's Hour of Reli-
- gion.
  5 p. m.—Treble Quartet.
- 880k—WMCA—NEW YORK—341m 11 a. m.—First Church Christ services. 3:30 p. m.—Donald Flamm Frolickers. 5:25 p. m.—Halpert and Fryxell, Buck
- 1100k-WFBH-NEW YORK-273m 5:30 p. m.—Franklin Four.
  6 p. m.—World Masonic news.
  6:30 p. m.—Entertainers.
  6:55 p. m.—Talk.
  7 p. m.—Eddide Woods.
- 7 p. m.—Eddide Woods. 7:15 p. m.—Studio program. 11:30 p. m.—Castillian Royal Orchestra. 11:45 p. m.—Sleepy Hall OOrchestra. 1040k—WLWI—NEW YORK—288m p. m.—Paulist Choristers; sermon by Rev. Robert A. Skinner. 1290k—WOKO—NEW YORK—283m a. m.—Services from Chelsea M.
- 7.45 p. m.—Services from Chelsea M. E. Church.
- Church.

  1100k—WBBR—STATEN ISLAND—273m

  10 a. m.—Watchtower Trio.

  10:15 a. m.—L. Brown soprano.

  10:45 a. m.—L. Brown soprano.

  11 a. m.—Bible lecture Trio; singers.

  11 a. m.—Choral Singers; trio.

  2 p. m.—Watchtower Orchestra.

  2:20 p. m.—L. Brown, soprano.

  2:30 p. m.—Bible lecture "Even the Rebellious."
- nethous."
  3:15 p. m.—Bible instruction.
  3:40 p. m.—Watchtower Orchestra.
  9 p. m.—Watchtower Instrumental Trio.
  9:20 p. m.—Bible questions and answers.
- WRST—BAYSHORE—216m m.—Radiolians dance music 1140k-WAAM-NEWARK-263n 11 a. m.—Church services

- 1140k—WAAM—NEWARK—263m

  11 a. m.—Church services.

  1190k—WGCP—NEWARK—252m

  12:15 p. m.—Elgy Mayer, soprano.

  12:30 p. m.—Jimmy Farrell's Orchestra.

  1:30 p. m.—Jimmy Farrell's Orchestra.

  1:30 p. m.—Maria Stuart, soprano.

  2 p. m.—Maria Stuart, soprano.

  2 p. m.—Maria Anderson, contralto.

  2:30 p. m.—Martha Anderson, contralto.

  2:30 p. m.—Betty Chandler. soprano; Lillian Weidanz, organist

  1:45 p. m.—Emily O'Neill, soprano; Oscar

  Voigt, barytone; Gustav Bischoff planist.

  4:30 p. m.—Paramount Trio.

  4:30 p. m.—Elsie Fairall, contralto.

  5:15 p. m.—Claremont Male Quartet.

  7 p. m.—Ilmmy Shearer songs.

  8 p. m.—Rina D. Guindani, planist.

  8:15 p. m.—Joseph Lalli, barytone.

  8:30 p. m.—Mother Goose Girl.

  8:30 p. m.—Mother Goose Girl.

  8:34 p. m.—Alice Davis harpist.

  9:15 p. m.—Paramount Trio, vocal.

  1340k—WODA—PATERSON—224m
- 1340k—WODA—PATERSON—224m 35 a. m.—First Baptist Church Service. 10 p. m.—Market Street M. E. Church Service.
- Service.
  590k—W00—PHILADELPHIA—508m
  2:30 p. m.—Musical exercises opening Sun day School.
  6 p. m.—Sacred organ recital.
  7:30 p. m.—Evening services.
- 730 p. m.—Evening services.
  760k—WLIT—PHILA DELPHIA—395m
  6:30 p. m.—Organ recital.
  7:30 p. m.—Concert Orchestra.
  8 p. m.—Friends of Chamber Music Society
  590k—WIP—PHILA DELPHIA—508m 10:45 a. m.—Morning service. 760k—WFI—PHILADELPHIA—395m
- 10:20 a. m.—Church services. 4:30 p. m.—Chapel service church choir 1080k—WCAU—PHILADELPHIA—278m
- 1030K—WCAU—FHILADELFHA—2:6m 11 a.m.—Church service, the Rev. 5 p. m.—Radio church service, the Rev. J. W. Stockwell. 6:45 p. m.—Clarence Seaman's Orchestra. 7:45 p. m.—Billy Hays's Orchestra. 8:30 p. m.—Bonwit Teller Ensemble. 9 p. m.—Hour of music. 10 p. m.—Charlie Kerr's Syncopated Artists.
- 1090k-WHAR-ATLANTIC CITY-275m \$:15 p. m.—Organ recital.
  4:15 p. m.—Community vocal and instrumental recital.
  p. m.—News flashes and scores.

- 1090k-WHAR-ATLANTIC CITY-275m 16:45 a. m.—Morning service. 2:15 p. m.—Short sacred recital. 2:45 p. m.—Sermon by Philip E. Howard. 7:50 p. m.—Evening service. 9 p. m.—"An Hour With the Classics." 790k-WGY-SCHENECTADY-380m a. m.—Service.
  30, p. m.—Organ recital.
  p. m.—Service.
  p. m.—Commodore Orchestra.
  p. m.—Violin recital, Godfrey Ludlow.
  - 940k-WGR-BUFFALO-819m 1130k—WMAK—BUFFALO—266m 11:25 a. m.—Morning service. 1 p. m.—Evening service. 1080k—WHAM—ROCHESTER—278m
  - p. m.—Chapel service. 980k—WJAR—PROVIDENCE—306m 980k—WJAR—PROVIDENCE—Soon 7:20 p. m.—Capitol Theater Family, 9:15 p. m.—Musical program. 10:70k—WNAC—BOSTON—280m 10:58 a. m.—Morning service. 1:30 p. m.—Concert. 8:35 p. m.—Baseball results.
  - m.—Sager's hour of hospitality, p. m.—The Friendly Voice, m.—Jordan Company's Sparkling Diamonds.
    1:20 p. m.—Capitol Family.
    1:15 p. m.—Concert.
    900k—WBZ—SPRINGFIELD—333m
    1 a. m.—Church services.
    p. m.—Sunday evening dinner concert.
    p. m.—Golden Rule hour of the Near
    East Relief.
    p. m.—Organ recite!
  - East Relief.

    p. m.—Organ recital.
    1120k—WTAG—WORCESTER—268m
    5:30 p. m.—Program to be announced.
    15-10:15 p. m.—Atwater Kent radio hour.
    640k—WCAP—WASHINGTON—469m
  - a. m.—Church service.
    p. m.—Outdoor service.
    20-9:15 p. m.—Capitol Theater program.
    15 p. m.—Atwater kent concert.
    1220k—WBAL—BALTIMORE—246m 120E-WBAL-BALTIMORE-240m 8:30 p. m.—Twilight program; all-Ameri-can program by WBAL; concert orches-tra; soloists. 970k-KDKA-PITTSBURGH—309m 10:30 a. m.—Service of the Calvary Epis-conal Church copal Church. p. m.—Organ recital. 15 p. m.—Vesper services. 10 p. m.—Children's period. 30 p. m.—KDKA Little Symphony Or-

- 660k-WJZ-NEW YORK-455m m.-Meyer Davis's Orchestra. 660k—WJZ—NEW YORK—455m
  1 p. m.—Meyer Davis's Orchestra.
  2 p. m.—News service.
  4 :30, 5:30, 7:30, 10:30 p. m.—News service.
  4 :20, b. :30, 7:30, 10:30 p. m.—News service.
  4 :15 p. m.—"Your daily menu."
  4 :15 p. m.—"Shopping Service."
  4 :35 p. m.—Commodore tea concert.
  4 :35, 7:30 p. m.—Baseball reports.
  5:32 p. m.—Market quovations.
  5:32 p. m.—Financial summary.
  5:40 p. m.—Cotton quotations.
  5:50 p. m.—Frinancial summary.
  5:50 p. m.—Farm market reports.
  7 p. m.—Madison dinner concert.
  7:55 p. m.—Shiner's Orchestra.
  9 p. m.—Reading Railroad Revelers.
  10 pp. m.—Moorland hour.
  10:45 p. m.—Harry Leonard's Orchestra.
  610k—WEAF—NEW YORK—492m
  645. 7, 7:20 a. m.—Health exercises.
  7:45 a. m.—Prayer services.
  11 a. m.—Mary L. Lewis, soprano.
  11:15 a. m.—"History of Cotton," Robert Cummings.
  11:30 a. m.—Mary Lewis, soprano.
  11:45 a. m.—"Embroidered Aprons," Ethel McCunn.
- 11.45 a. m.—"Embroidered Aprons," Ethel McCun.

  11.50 a. m.—"Poetry," Bertha Baker.

  12 noon-Market and weather reports.

  3 p. m.—Isabel Franklin, soprano.

  3.15 p. m.—Celia S. Negin, pianist.

  3.30 p. m.—Theodore Whitman, barytone.

  3.45 p. m.—"Modern European Fiction,"
  Dorothy Brewster.

  4.5:30 p. m.—Program in connection with the closing of the Academy of Music. Program: Overture, "Norma," symphony orchestra; talk by George B. Cortelyou; songs by Mme, Frances Alda; Otis Skinner, "The Theater Three-quarters of a Century Ago"; song; "Memories of the Fifties," by the Choral Society of the Consolidated Gas Company; orchestra; "Home, Sweet Home," by Mme, Alda.

  5.30 p. m.—Irving Cohn, saxophone; Dickinson Schwartz, pianist.

  6 p. m.—Dinne music.
- inson Schwartz, pianist.

  6 p. m.—Dinner music.

  6:55 p. m.—Baseball scores.

  7 p. m.—Columbia University lecture.

  7:20 p. m.—Manne Bacon, pianist.

  7:30 p. m.—Yanne Bacon, pianist.

  8:10 p. m.—John Ailegra, barytone.

  8:25 p. m.—Ycartoons and Buffoons," Clare
  Briggs.

  8:40 p. m.—Dorothy Rumage, contralto.

  9 p. m.—A. & P. Gypsies,

  10 p. m.—Grand opera, "La Gioconda."

  11-12 p. m.—Ben Bernle's Orchestra.

  9506—WGBS—NEW YORK—316m
- 1-12 p. m.—Ben Bernie's Orchestra.
  950k—WGBS—NEW YORK—316m
  0 a. m.—Timely talks with Terese.
  0;10 a. m.—Jack Cohen, pianist.
  0;15 a. m.—Radio gym class; piano.
  0;35 a. m.—Fashion talk; piano.
- :30 p. m.—Scripture reading. :35 p. m.—Grace Smalling, soprano. 1:35 p. m.—Grace Smalling, soprano.
  1:45 p. m.—Henry Schlossberg, violinist.
  Willette Wilbourne, pianist.
  2:30 p. m.—Interview with Mae West.
  3 p. m.—Special camping program.
  3:30 p. m.—Lillian Eichler, "Well Bred English."
  3:40 p. m.—Pietro Gentille, barytone.
  6 p. m.—Uncle Geebee.
  6:30 p. m.—Louis Gershenson's Orchestra.
  7 p. m.—Irene Weir, "Good Taste."
  7:10 p. m.—Louis Gershenson's Orchestra.
- 7:10 p. m.—Louis Gershenson's Orchestr 830k—WHN—NEW YORK—361m 2:15 p. m.—Blanche Weinburg, pianist. 2:30 p. m.—Bert Dagmar, barytone. 2:40 p. m.—Marguerite Stern, soprano. 2:50 p. m.—Jimmy Clark's Entertainers. 3:10 p. m.—News and sports. 4:5 p. m.—Hense good news party. 4:10 p. m.—Jessie Borock, songs. 4:20 p. m.—The Rev. Barnard Shicof 80ngs.
- songs.

  4:30 p. m.—Ruth Marr, planist.

  4:30 p. m.—Belle Brooks's Friends.

  4:40 p. m.—Eddie Gillis, barytone.

  5:10 p. m.—Polly's beauty talk.

  6:30 p. m.—Why Move Club.
- Shontz.

  30 p. m.—George's Surprise,
  p. m.—Leverich Three, "Peter the Gre

  30 p. m.—Loew's Orchestra.
  0 p. m.—Palisades Orchestra.
  0:30 p. m.—Leroy Smith's Orchestra.
  1 p. m.—Dance orchestra.
  1 m.—Alabam Orchestra.
  2 midnight—Dance orchestra.
- 12 midnight—Dance orchestra.

  1160k—WRNY—NEW YORK—258m

  11 a. m.—Ruth Conne, fashions.

  11:15 a. m.—Studio artist.

  11:30 a. m.—Irene Ayres, soprano.

  11:45 a. m.—Evelyn Hirsch, plano.

  12: noon—Musical Courier Says.

  12:15 p. m.—Harvey Schloeman, songs.

  12:13 p. m.—Ralph Christman, vianist.

  12:45 p. m.—Jack Fuld, planist.

  6:50 p. m.—Poetry.

  7 p. m.—Sports; commerce.

  7:10 p. m.—Radio Theater Index.

  7:30 p. m.—Orlando's Concert Orchestra.

  8 p. m.—Bill Rietz, songs.

  8:15 p. m.—Anateur's debut hour.

  9 p. m.—'The Hypno-Bloscope," Hug

  Gernsback
- 9 p. m.—'The Hypno-Bloscope, Gernsback, 9:15 p. m.—Musical Trävelogue. 9:30 p. m.—Henriette Angstreich, 9:45 p. m.—Judith Roth, soprano. 10 p. m.—Al Lack's Orchestra. 11 p. m.—Lenox Hill Players, 'Th

- p. m. 2:15 p. m.—Department of Agriculture 2:30 p. m.—Olcott Vail's String Enserab 12:15 p. m.—Department of Agriculture.
  12:30 p. m.—Cloctt Vail's String Enserable.
  2 p. m.—Theo Alban, tenor.
  3 p. m.—Sam Coslow, barytone.
  4 p. m.—Bob Brandes, songs.
  4:15 p. m.—Lost and Found Department.
  5:45 p. m.—Employment opportunities.
  6 p. m.—Oloctt Vail's String Ensemble.
  6:30 p. m.—Ernie Golden's Orchestra.
  7 p. m.—Employment opportunities.
  7:10 p. m.—Ernie Golden's Orchestra.
  8 p. m.—Terminal Music Hour.
  9 p. m.—Dr. John M. Tutt, "Christian Science."
- 6 p. m.—Bert Lowe, songs.
  6:30 p. m.—Ray Maher, barytone.
  6:45 p. m.—Marjorie Dee, contralto,
  7 p. m.—Sport talk, Hugh Hirshon
  7:15 p. m.—Entertainment.
- 30 p. m.—Mac and Lennie, humor.
  p. m.—Catholic Big Sisters Benefit Box.
  ing Bouts.
  p. m.—Steamship Leviathan Orchestra.
  1100k—WFBH—NEW YORK—273m p. m.—Orchestra.
  p. m.—Harry Kirsch, songs.
  15 p. m.—Marion Doran, soprano.
  30 p. m.—"Decorating," Edith Deane.
  45 p. m.—Billy King, impersonator.
  p. m.—Miriam Davis, songs.
  15 n. m.—"The Two Bills," Rockwell
  Conners
- 15 v. m.—'The Two Bhis, Conners,
  Conners,
  130 p. m.—Lucille Allison, Lou Davis
  Jimmle Moore, songs,
  115 p. m.—Bernie Pollock, barytone,
  130 p. m.—Greystone Trio.
  5 p. m.—American Legion News,
  6:15 p. m.—Volley Endriss, contraite,
  6:30 p. m.—Blucher Trio. 1430k-WBNY-NEW YORK-210m
- 1430k—WBNY—NEW YORK—210.
  p. m.—Knickerbocker String Trio.
  55 p. m.—Movie talk.
  p. m.—Blue Crest Collegians.
  15 p. m.—Drawing Room Players.
  p. m.—Harmony Boys.
  15 p. m.—Eue Crest Collegians.
  0 p. m.—Loretto Reynolds, soprano.
  0:15 p. m.—Lewis Bring.
  0:30 p. m.—Al Rose and company.
- 10:30 p. m.—Al Rose and company.

  570k—WNYC—NEW YORK—526m
  0 p. m.—Herman Neuman, pianist.
  6:10 p. m.—Harnan Neuman, pianist.
  6:20 p. m.—Plano selections.
  6:30 p. m.—Elementary German lessons.
  7 p. m.—Advanced German lessons.
  7:35 p. m.—Police alarms.
  7:35 p. m.—Police alarms.
  7:50 p. m.—Frank Ochs, tenor.
  8 p. m.—"Baseball." John B. Foster.
  8:15 p. m.—Salvatore Cusenza, mandolls.
  8:45 p. m.—Francis Mancuso, "Crime C dittons."
  9 p. m.—Eureka Instrumental Quartet. g p. m.—Eureka Instrumental Quartet. 9:30 p. m.—Richmond Versatile Orchestra 10:30 p. m.—Police alarms, weather fore
- 1250k-WHAP-NEW YORK-240m 6:30 p. m.—Holmes's String Ensemble. 7:15 p. m.—Lucile Wilkin, pianist. 7:45 p. m.—News digest. 8:05 p. m.—Steel Jamison, tenor. 8:20 p. m.—Mary Price, "Air Question 8:20 p. m.—Mary Price, "Air Question-naire."
  8:35 p. m.—Sibyl Marvin Huse, speaker.
  9 p. m.—Sylvan String Trio.
  9:15 p. m.—James Hyndman, "The Pyramid of Gizeh."
  9:35 p. m.—Sylvan String Trio.
  9:50 p. m.—Listeners' variety program
  WHAP men's quartet.
- 1290k—WOKO—NEW YORK—233m 1290K—WORU—NEW YORK—235m 1.15 p. m.—Anna Diamond, planist. 1.15 p. m.—Lynne and Beutel, duets. 1.30 p. m.—Sunshine Sonny. 1.20 p. m.—Joe Van, Bill Stengle, duets. 1.20 p. m.—Phil Gleason, barytone, 1.20 p. m.—Vanity Orchestra. 1040k-WLWL-NEW YORK-288n
- 1040k—WLWI--NEW YOKK—R :30 p. m.—Chamber music. p. m.—Question Box. :30 p. m.—Schickerling Concert. 0 p. m.—Study Club. 0:15 p. m.—Howard Melick, bass. 0:30 p. m.—St. Cecelia Ensemble. ):30 p. m.—St. Cecella Ensemole. 0:45 p. m.—Alma Stoll, contraito. 1100k—WBBR—STATEN ISLAND—278m p. m.—Syrian music. 30 p. m.—Bible instruction, 45 p. m.—Syrian music. 50k—WAHG—RICHMOND HILL—\$16m
- noon—Grebe Matinee Trio.

  D. m.—Boy Scouts program.

  D. m.—Byron Hatfield, barytone.

  D. m.—Synchrophase Hour.

  D. m.—Major Dent Atkinson.

  D. m.—Walter Johnson, tenor; James avail barytone.
- 9:50 p. m.—Dorathea Rampmaier, contraito.
  10:05 p. m.—Lou Drago, melodist.
  10:20 p. m.—Frank Tremer's Orionites.
  11:02 p. m.—Frank Tremer's Orionites.
  12 midnight—Ferrucci's Radio Raiders.
  740k—WOR—NEWARK—405m
  6:45-7:15-7:45 a. m.—Gym class.
  2:30 p. m.—Edna Bachman, soprano; Paula Heminghaus. contraito.
- p. m.—Edna Bathinan, haus.

  3:15 p. m.—Ukelele Dick Hughes.

  3:30 p. m.—Timely Food Topic.

  3:45 p. m.—Ukelele Dick Hughes.

  6:15 p. m.—Bill Wathey, "Sports."

  6:30 p. m.—Jacques Jacobs' Encemble.

  7:30 p. m.—Copenhagen Quartet.

  8 p. m.—"Current Events' lecture, H.
- Kaltenborn.
  8:30 p. m.—Virginia Richards, soprano.
  8:45 p. m.—Klein's Serenading Shoe makers.
  9:45 p. m.—The Lyric Club.
  10 p. m.—Lieutenant Taylor, "Parachut Jumping."
  10:15 p. m.—The Lyric Club.
  10:30 p. m.—Saturday Review of Literature.
- ture.

  0.45 p. m.—Leon Wood, organist.

  1.15 p. m.—Five Messner Brothers.

  1.30 p. m.—'Cherry Pie' program.

  1.40 p. m.—Five Messner Brothers.

  1.40 p. m.—Five Messner Brothers.

  1.40k—WAAM—NEWARK—268m

  1. m.—Happy Hour program.

  p. m.—Francis Jones' Brownies.

  p. m.—Sport talk by Mater Tees p. m.—Francis Jones Brownies, p. m.—Sport talk by Major Tate, :15 p. m.—Thad Cohick, tenor. :30 p. m.—Newark Chamber of Commerce, :35 p. m.—Maier Novelty Trio. p. m.—Rev. MacPherson's Fellowship Hour.
- p. m.—Rev. Hour. p. m.—Ray Nichols' Orchestra. 2:30 p. m.—Versatility Boys. Prown's Orchestr p. m.—Versatility Boys.
  p. m.—Joe Brown's Orchestra.
  1190k—WGCP—NEWARK—252m
  m.—Studio program.
  p. m.—Plano duets.
  p. m.—Douglass Lane Artists.
  m.—Jack Shatter, Reg Pierce,
  md barvione 9 p. m.—Jack Shatter, Reg Pierce, tenes and barytone. 3:15 p. m.—Gene Sneden, songs. 9:30 p. m.—Tenor and barytone. 9:45 p. m.—Studio program. 10 p. m.—Hannah Carlson, soprane; Brook Carlson, violinist.
- 10 p. m.—Hannah Carlson, soprano; Broor Carlson, violinist.

  10:15 p. m.—Hugo Waibel, planist.

  10:30 p. m.—Hannah Carlson, soprano; Broor Carlson, violinist.

  10:45 p. m.—Hugo Waibel, planist.

  10:45 p. m.—Hugo Waibel, planist.

  11 p. m.—Hawatha Country Orchestra.

  1130k—WEAM—PLAINFIELD, N.J.—261m

  to 10:30 p. m.—Musical program from Plainfield High School auditorium.

  1230k—WGBB—FREEFORT—244m

  p. m.—Bob Hildenbrand's Trio.

  8 p. m.—Bob Hildenbrand's Trio.

  8:30 p. m.—Emma Sunshine, reader.

  8:45 p. m.—Cecelia McGinn, soprano.

  9 p. m.—Paul Hoffman, tenor.

  9:15 p. m.—John Cramer, xylophone.

  9:30 p. m.—Harold Manning, saxophone.

  9:45 p. m.—Mabel Kennedy, Sally Fisher, songs. songs.
  (6 p. m.—Paul Hanneforth, violinist.
  10:15 p. m.—Corean dance orchestra.
  1390k.—WRST.—BAYSHORE—216m
  '-7:465 p. m.—Jack Watson's Theater (

chestra, 7:45-10 p. m.—Musical program, 1340k—WODA—PATERSON—224m

12 noon—WODA chamber music. 5 p. m.—Studio program. 5:30 p. m.—News; sport talk.

MONDAY, MAY 17 E. Heimberger's Dance music WGY Orchestra Versatile Vincent Lopez Al Lack's Arcadia Ed Andrews's Dance music Woodmansten
H. Leonard's
Adelphia
Ben Bernie's
S. S. Leviathan Royal Hiawatha Bergere Dance music

Wave

WCAU WRST WHN WFBH

7:45 8-10 10:45 11:80

Station length. Orchestra

Biliy Hay's Radiolians Janssen's Castillian Royal

- 6 p. m.—Stanley Todd's Orchestra.
  8:15 p. m.—Plays worth while.
  8:30 p. m.—Blue Moon Serenaders.
  9 p. m.—Dance music.
  9:40 p. m.—Wynona George Claydon.
  9:50 p. m.—Wynona Male Quartet.
  10 p. m.—Grace Hopper, contraito.
  10 p. m.—Marg. Daly, soprano.
  10:10 p. m.—Clare Wehrle, soprano.
  10:20 p. m.—Wynona Male Quartet.
  10:30 p. m.—Madaline Clay, soprano.
  10:40 p. m.—Babbina Crawley, contraito.
  10:50 p. m.—Male Quartet.
  590k—WOO—PHILADELPHIA—508m 590k-WOO-PHILADELPHIA-508m
- 599K—WOO—PHILADELPHIA—508m

  1 a. m.—Grand organ,

  2 (noon)—Luncheon music,

  45 p. m.—Grand organ, trumpets,

  50 p. m.—Dinner music,

  p. m.—Organ recital,

  50 p. m.—Address, Rev. Forest Dager,

  p. m.—Music by gypsies,

  10 p. m.—Band concert,

  11 p. m.—Addelphia Dance Orchestra, 11 p. m.—Adelphia Dance Orchestra.

  760k—WLIT—PHILADELPHIA—395m

  12 p. m.—Organ recital—Stanley Theater.

  12:20 p. m.—Religious service; orchestra.

  2 p. m.—Concert orchestra.

  2:50 p. m.—Heart talk.

  4:35 p. m.—Aritst recital.

  5 p. m.—Pelrce School.

  5:15 p. m.—Sesquicentennial program.

  7:30 p. m.—Dream Daddy.

  8 p. m.—Short Agro Wages
- .30 p. m.—Dream Daddy, p. m.—Short Agro Waves.
  .30 p. m.—Starr Plano Company artis p. m.—Starley Theater hour.
  0 p. m.—Arcadia Dance Orchestra.
  0.30 p. m.—Vaudeville.
  0.45 p. m.—El Fatio Dance Orchestra. 590k-WIP-PHILADELPHIA-508r
- 7. m.—Definer music.
  7. p. m.—Department of Agriculture,
  7. p. m.—Roll call and birthday list.
  760k—WFI—PHILADELPHIA—395m
  10:30 a. m.—Civic Pride Association.
  1 p. m.—Tea room ensemble.
  1:40 p. m.—Tea room ensemble.
  3 p. m.—Studio program by artists,
  6:30 p. m.—Concert orchestra.
  7 p. m.—Dance orchestra.
  7 p. m.—Dance orchestra.
  7 p. m.—Dance orchestra.
  7 20 p. m.—Recital by N. Snellenburg.
  8 p. m.—Carolyn Thomas, soprano.
  8:30 p. m.—The Hood Boys.
  8:45 p. m.—Kathryn Fichthorne, contralto.
  9 p. m.—The Merry Minstrels.
  9:30 p. m.—Jackson and Ellis, songs,
  10 p. m.—Madrigal Mixed Quartette.
  1090k—WHAR—ATLANTIC CITY—275m
  2 p. m.—Seaside Trio.
- D. m.—Seaside Trio.

  130 p. m.—Industrial Talk, R. Orville
  Ketchum.

  D. m.—Seaside Trio.

  1 p. m.—Follies Bergere Dance Orches-
- 11 p. m.—Follies Bergere Dance Grosertra.

  1000k—WPG—ATLANTIC CITY—300m
  4:30 p. m.—Meternoon Tea Music.
  3:45 p. m.—Organ Recital.
  7 p. m.—Arthur Eldred.
  7:15 p. m.—Dinner music.
  8 p. m.—Children's Hour.
  8:30 p. m.—Alice Sachse, planiste.
  8:45 p. m.—"Safety Dialogue," Helen and Wallace.
- Wallace.

  9 p. m.—Safety Dialogue. Heren and Wallace.

  9 p. m.—Wincent Lopez's Orchestra.

  10 p. m.—Wincent Lopez's Orchestra.

  11 p. m.—Eddie McKnight's Dance Orchestra.

  12:30 p. m.—Market report.

  2:30 p. m.—Music; home economics talk.

  6 p. m.—Stock reports; news.

  6:30 p. m.—Dinner program.

  7:30 p. m.—WGY Orchestra.

  8:15 p. m.—WGY Orchestra.

  8:15 p. m.—WGY Orchestra.

  9 p. m.—WGY Orchestra.
- m.-WGY Orchestra. 940k-WGR-BUFFALO-\$19m 6:30 p. m.—Dinner music. 8 p. m.—Address, W. M. Hekking. 8:10 p. m.—Address on War Risk Insur ance. :15 p. m.—Auto Camping de Luxe. 30 p. m.—The Kiwanis Twins.
  p. m.—Harriet Shire, soprano.
  30 p. m.—Bea North Good, planist,
  p p m.—Mixed Quartette.
- 10 p. m.—Mixed Quartette.
  11 p. m.-1 a. m. —Supper music.
  1130k—WMAK—BUFFALO—266m
  120-8:30 p. m.—Musicale by Madame
  Blaauw.
  1:30—Song recital.
  11:30 p. m.—Musical program.
  1080k—WHAM—ROCHESTER—27811 :30 p. m.—Eastman Theater organ.
  p. m.—Eastman Theater organ.
  :30 p. m.—Eastman Theater Orchestra.
  790k—WHAZ—TROY, N. Y.—380m 9:30 p. m—Troy High School Musica Clubs. 10 p. m.—Address, Edward R. Cary. 10:30 p. m.—"Changes in New York Game Laws."
- 1:05 p. m.—Studio program. 7:45 p. m.—Musical program. 9 p. m.—"A. & P. Gypsies." p. m.—Grand Opera Hour. 630k—WTIC—HARTFORD a. m.—Travelers Orchestra.
  30 p. m.—The Children's Entertainer.
  50 p. m.—Hub Trio.
  30 p. m.—Capitol Theater Orchestra.
  45 p. m.—Vacation talk.
  p. m.—Mme. Fely Clement, soprano.
  30 p. m.—Emil Heimberger's Orchestra.
  p. m.—Grand Opera hour.
  p. m.—Travelers Symphonic ensemble.
- news.

  1 p. m.—Luncheon concert.

  4 p. m.—Copley Plaza Trio.

  4:20 p. m.—The Blond Planist.

  6 p. m.—Krazy Kat Kiddies Klub.

  8:30 p. m.—Lido Venice dinner dance.

  7:35 p. m.—Talk on rheumatism.

  Metropolitan Theater Studio. p. m;—Metropolitan Theater Studio. p. m;—Metropolitan Grand Orchestra 1:30 p. m;—Organ recital. 860k—WEEI—BOSTON—349m
- m.—"Walker."

  p. m.—Varsity Tire Entertainers.

  p. m.—"What Chance Has a ness Beginner?"

  p. m.—A. & P. Gypsies.

  p. m.—Ed Andrews' Orchestra.

  900k—WBZ—SPRINGFIELD—333m

  140 p. m.—Baseball results; farm flashes.

  p. m.—Capitol Theater Orchestra.

### Daylight Saving Time

1160k-WRNY-NEW YORK-258m

1100k—WEBJ—NEW YORK—273m p. m.—Dan Barnett's Orchestra. 30 p. m.—Luna's Marine Band. p. m.—Rallroad talk, Garrow Geer.

1430k-WBNY-NEW YORK-210m

1410k-WMSG-NEW YORK-213m

7:15 p. m.—Len Saxon, tenor.
7:30 p. m.—Aurora Mixed Quartet.
8 p. m.—S. S. President Roosevelt Orchestra
9 p. m.—Earl V. Dannals, radio talk,
9:15 p. m.—Carl Liverman, pianist.
9:30 p. m.—Eva De Rodriguez, contralto.
9:45 p. m.—Josephine McCormick, pianist.
10 p. m.—K. of C. Glee Club.
10:30 p. m.—S. S. Leviathan Orchestra.

1040k-WLWL-NEW YORK-288m

9:45 p. m.—Alec Compinsky, cellist; Man-uel Compinsky, violinist.
10 p. m.—"Timely Topics," Rev. Jas. Gillis.
10:15 p. m.—Premier Male Quartet.
10:30 p. m.—Talk by Dr. Thomas Walsh.
10:45 p. m.—Edwin Caplin, tenor.
950k—WAHG—RICHMOND HILL—316m

1,140---WAAM--NEWARK---263m

WHN 361 Dance music WEAF 492 . Pelham Heath

Seville's
Ben Bernie's
Hudson-Essex
Loew's
Gedney's
Dance music
Vanity
Nat Martin's
Dance music
Hotel Traymor
S. S. Leviathan
L. Smith

Freddie Rich's

Parodians
Vincent Lopez
E. Golden's
Follies Bergere
Dance music

Arcadia E. Heimberger's

11-1 11:00 11-1 11:00 11:30 11:30

THURSDAY, MAY 20

FRIDAY, MAY 21

WGBS
WRNY
WJAN
WHN
WNYC
WODA
WOKO
WIP
WODA
WPG
WMSG
WHN
WJZ
WCAU
WEAF

p. m.—Populuar entertainment. :20 p. m.—Dr. W. A. Bates, "Vision." :30 p. m.—Theo Alban, tenor. p. m.—Sport talk. :15 p. m.—Len Saxon, tenor.

:30 p. m.—Organ recital. p. m.—Gehrman, barytone; Sadie Yellen. soprano. 1:30 p. m.—Empire Singing Orchestra. 0:30 p. m.—Robert Morris, Alice Guertin ·20 n m — Laew's Lexington Orchestra

- duets.
  1120k—WTAG—WORCESTER—268m
  10:30 a. m.—Musical selections; talk.
  12:05-2 p. m.—Luncheon music.
  7 p. m.—Astronomy talk.
  7:15 p. m.—"Twilight Scouts."
  8 p. m.—"Pest Control in the Garden,"
  8:30 p. m.—WTAG Entertainers.
  9:10 p. m.—Robin Hood hour of music.
  10-11 p. m.—Grand Opera.
  640k—WCAP—WASHINGTON—469m
  6:45 a. m.—Tower health exercises.
- 3:20 p. m.—Loew's Lexington Orchestra 5 p. m.—News and sports. 5:10 p. m.—Al Fox, songs and talk, 5:25 p. m.—News and sports. 6:30 p. m.—Everglades Orchestra. 7 p. m.—Arthur Normandin's Quartet, 7:30 p. m.—Will Oakland's Chateau, 8 p. m.—Treasureland Neighbors. 8:30 p. m.—Judith Roth, soprano, 8:45 p. m.—Prince Piotti, songs. 9 p. m.—Odlerno Mixed Quartet, 9:30 p. m.—Loew's Orchestra. 10 p. m.—Universal Trio. 10:30 p. m.—Strand Orchestra, 11 p. m.—Dance orchestra. 11:30 p. m.—Alabam Orchestra. 11 midnight—Dance orchestra. 11 midnight—Dance orchestra. 11 midnight—Dance orchestra. 1160k—WENY—NEW YORK—258E 45 a, m.—Tower health exercises, p. m.—Tower health exercises, p. m.—Studio program.
  p. m.—Studio program.
  p. m.—A. and P. Gypsies.
  0 p. m.—Grand opera, "La Gloconda."
  640k—WRC.—WASHINGTON—469m 1:55 a. m.—Arlington time signals, 2 noon—"Fifty Farm Flashes," under the auspices of the Department of Agri 2:20 p. m.—Organ recital from the studios 2:20 p. m.—Organ recital from the studios of the Homer L. Kitt Plano Company.

  1 p. m.—Raleigh Hotel Orchestra; Roy Laing directing.

  5 p. m.—"Housekeepers' Half-hour,' by Dorothy Townsend.

  5:45 p. m.—"Things Talked About," by Mrs. Nina Reed.

  1220k—WBAL—BALTIMORE—246m.

  130 p. m.—Dinner program.
- 1160k—WRNY—NEW YORK—258m

  11 a. m.—Military Trend.

  11:15 a. m.—Club women's hour.

  12 noon—West Side Unitarian Church organ recital,

  6:45 p. m.—Law series.

  7 p. m.—Sports; commerce.

  7:15 p. m.—Radio Theater Index.

  7:30 p. m.—Camping for boys and girls.

  8 p. m.—Toes the Insulation Matter?"

  Baxter Rowe.

  8:15 p. m.—Verna Scott, soprano.

  8:30 p. m.—New York Edison hour.

  9:30 p. m.—Lazar Samoiloff's Sextet.

  10:15 p. m.—"Vocations Offered by Radio,"

  Leon Adelman.

  10:30 p. m.—John Hugo's Hour of Music.

  11 p. m.—"Up and Down Broadway."

  1100k—WEBJ—NEW YORK—273m :30 p. m.—Dinner program.
  :30 p. m.—WBAL Sandman Circle,
  ) p. m.—Musical program by artists.
  0 p. m.—Talk by Jesse Bennett.
  0:10 p. m.—Musical program.
  1 p. m.—WBAL Ensemble.
  970k—WDKA—PITTSBURGH—309m p. m.—Dinner concert, p. m.—Children's period. m.—Stockman-farmer new 8:10 p. m.—A. Wayne, singing reporter. 8:20 p. m.—Sara V. Turits, soprano. 8:30 p. m.—Luna's Knickerbocker C. chestra.
- dress. p. m.—Ruud light opera hour. 650k—WCAE—PITTSBURGH—4612 6:50k—WCAE—PITTSBURG.
  6:30 p. m.—Dinner concert.
  7:30 p. m.—Studio concert.
  8 p. m.—Studio concert.
  10 p. m.—Grand opera.
  11:05 p. m.—Dance orchestra.

- 1430k—WBNY—NEW YORK—210m
  7 p. m.—Knickerbocker Trio.
  8 p. m.—Joseck "himself."
  8:15 p. m.—Ona Welsh.
  8:45 p. m.—Steve Andrews, uke.
  9 p. m.—Rose Fisher, pianist.
  9:15 p. m.—Ruth Jackson, soprano.
  9:30 p. m.—Dagmar Dance Orchestra.
  10 p. m.—Ruth Jackson, soprano.
  10:30 p. m.—Dagmar Dance Orchestra.
  1100k—WFBH—NEW YORK—278m
  2 p. m.—Orchestra. TUESDAY 660k-WJZ-NEW YORK-455m
- 1100k—WFBH—NEW YORK—278m

  2 p. m.—Orchestra.

  3 p. m.—Studio program.

  3:30 p. m.—Marcia James, soprano.

  3:45 p. m.—Carl Jiencke, composer.

  4 p. m.—Nita Nadine, songs; Fred Osbore, Teresa Gluck, songs.

  4:45 p. m.—Carl Smith, Joe Davis, songs.

  5 p. m.—Ecstatic Junior Glee Club.

  5:30 p. m.—Sam Perry's Pals.

  6 p. m.—Frank Ramph, songs.

  6:15 p. m.—Majestic String Ensemble.

  11:30 p. m.—Majestic String Ensemble.

  11:30 p. m.—Connie's Inn Orchestra.

  880k—WMCA—NEW YORK—341m 11:30 p. m.—Connie's Inn Ordnestra.

  880k.—WMCA.—NEW YORK.—341m

  10:30 a. m.—Market reports.

  11 a. m.—Ida Allen's Homemakers Club.

  11:30 a. m.—Waking a New Face."

  12:15 p. m.—Department of Agriculture.

  12:30 p. m.—Olcott Vall's String Ensemble.

  1:30 p. m.—Market reports (hourly to 3:30).

  2 p. m.—Sherman and Neale, songs.

  3 p. m.—Ukulele Dick Hughes.

  4:30 n. m.—Charles Purcell, songs.
- 666k—WJZ—NEW YORK—455m.

  1 p. m.—Pennsylvania Luncheon Orchestra.

  2 p. m.—Weather; news service.

  4:30, 5:30, 7:30, 10:30 p. m.—News service.

  4:25, 7:30 p. m.—Baseball reports.

  4:25 p. m.—Your Daily Menu."

  4:15 p. m.—'Your Daily Menu."

  4:15 p. m.—Olive Foster, "How to Grow Prize Dahlias."

  4:35 p. m.—Commodore tea music.

  5:32 p. m.—Market quotations.

  5:32 p. m.—Financial summary.

  5:40 p. m.—Cotton quotations.

  5:30 p. m.—Frank Dole on "Whippets."

  7 p. m.—Frank Dole on "Whippets."

  7 p. m.—Frank Dole on "Whippets."

  8:15 p. m.—Cosmo hamilton, Radio Novel.

  8:30 p. m.—The Deltah Pearl Hour, "Gems of Romance."

  10 p. m.—The Grand Tour, "Scandinavian Capitol."

  10:45 p. m.—George Olsen's Orchestra.

  610k—WEAF—NEW YORK—492m

  6:45, 7, 7:20 a. m.—Health exercises.

  7:45 a. m.—Prayer services.

  11 a. m.—Prayer services.

  11 a. m.—Prayer services.

  11 a. m.—Board of Education lecture.

  11:25 a. m.—Norman Secon, planist.

  11:30 a. m.—Norman Secon, planist.

  11:30 a. m.—Norman Secon, planist.

  11:50 a. m.—Norman Secon, planist.

  11:10 noon—Market and weather reports.

  12 p. m.—Luncheon in honor of Francis Wilson.

  4 p. m.—Sadrian String Trio.

  4:30 p. m.—Women's program; "Festival of Sevvoth"; songs. 3 p. m.—Ukulele Dick Hughes,
  4:30 p. m.—Charles Purcell, songs.
  5:45 p. m.—Employment opportunities.
  6 p. m.—Cloott Vail's String Ensemble.
  6:30 p. m.—Employment opportunities.
  6:45 p. m.—Elvina Bock, children's stof
  7 p. m.—Hofbrau Haus Entertainers.
  7:30 p. m.—Sach's Quality Bbys.
  8 p. m.—Pace Institute program.
  8:20 n. m.—Palmer pen lesson.
- p. m.—Women's Sevvoth"; songs. 8:30 p. m.—Columbia Entertainers. 10 p. m.—"How to Drive," Harry Rai 10:15 p. m.—McAlpin news editor. 10:30 p. m.—Musical program. 11 p. m.—Ernie Golden's Orchestra. 12 p. m.—McAlpin Entertainers. p. m.—Dinner music.

  45 p. m.—"Message to Children," by Mr.
  Henry Peabody.
  p. m.—Max Kaifus, tenor.

  10 p. m.—Columbia University Frenc
- p. m.—Salon concert. p. m.—Moment musicale. 30 p. m.—Vincent Lopez's Orchestrs. 12 p. m.—"The Buffalonians." 950k—WGBS—NEW YORK—316m
- 950k—WGBS—NEW YORK—316m 10 a. m.—Timely talks with Terese. 10:10 a. m.—Anna Robertson, soprano. 10:15 a. m.—Yradio Gym Class'; songs. 10:35 p. m.—French recipes; songs. 1:35 p. m.—Pirates Den Orchestra. 1:36 p. m.—Interview with Russell Mack. 3 p. m.—Special camp program. 1:30 p. m.—Harmony and composition 1essons.
- lessons. p. m.—Uncle Geebee. 30 p. m.—John Crowley, violinist; Her-bert Phillips, planist. 40 p. m.—Lorette Hurley, "One Girl Show." Show."
  6:50 p. m.—Judith Roth, songs.
  7 p. m.—Arrowhead Concert Orchestra.
  8 p. m.—Jonas Butenas, barytone.
  8:10 p. m.—Bernard Maltin, planist.
  8:20 p. m.—Jonas Butenas, barytone.
  8:30 p. m.—Gluck's 18th Century Oper
  "Orpheus"; Richard Hale, barytone.
- "Orpheus"; Richard Hale, barytone.

  1 p. m.—Arrowhead Dance Orchestra.
  570k.—WNYC—NEW YORR—526m

  8:35 p. m.—Herman Neuman, pianist.
  6:45 p. m.—Halman Neuman, pianist.
  6:55 p. m.—Piano selections.
  7:05 p. m.—Piano selections.
  7:20 p. m.—Hilda Reich, soprano.
  7:20 p. m.—Hilda Reich, soprano.
  7:30 p. m.—Police alarms.
  7:55 p. m.—Astor Soclety Orchestra.
  7:50 p. m.—Astor Soclety Orchestra.
  7:50 p. m.—Frank Stoddart, tenor.
  8:30 p. m.—Arrow Stoddart, tenor.
  8:30 p. m.—Arrow Stoddart, tenor.
  8:30 p. m.—Arrow Revlew of Sports.
  7:55 p. m.—Astor Soclety Orchestra.
  7:56 p. m.—Franks Stoddart, tenor.
  8:30 p. m.—Francis Stoddart, tenor.
  8:30 p. m.—Arrow Revlew of Sports.
  7:55 p. m.—Astor Soclety Orchestra.
  7:56 p. m.—Franks Stoddart, tenor.
  8:30 p. m.—Francis Stoddart, tenor.
  8:30 p. m.—Arrow Mam—NEWARK—263m
  11 a. m.—Cooking lesson.
  11:30 a. m.—Hoalpy Hour program,
  6 p. m.—Franks Stoddart, tenor.
  7:55 p. m.—Astor Soclety Orchestra.
  7:56 p. m.—Franks Stoddart, tenor.
  8:30 p. m.—Francis Stoddart, tenor.
  8:30 p. m.—Francis Stoddart, tenor.
  9 p. m.—Garden talk.
  9:15 p. m.—Gym Class.
  2:30 p. m.—Frank Stoddart, tenor.
  8:30 p. m.—Frank Stoddart, tenor.
  9 p. m.—Garden talk.
  9:15 p. m.—Garden talk.
  9:15 p. m.—Gred Klem, pianist, tenor.
  9:30 p. m.—Frank Stoddart, tenor.
  9 p. m.—Garden talk.
  9:15 p. m.—Gred Klem, pianist, tenor.
  9:30 p. m.—Frank Stoddart, tenor.
  9 p. m.—Garden talk.
  9:15 p. m.—Garden talk.
  9:15 p. m.—Gred Klem, pianist, tenor.
  9:30 p. m.—Frank Stoddart, tenor.
  9 p. m.—Garden talk.
  9:15 p. m.—Gred Klem, pianist, tenor 6:35 p. m.—Herman Neuman, planist. 6:45 p. m.—Market high spots. 6:55 p. m.—Plano selections. 7:05 p. m.—Stanley Silverburg, mus 7:30 p. m.—Hilda Reich, soprano.
  7:35 p. m.—Lecture, Winter Russell,
  7:50 p. m.—Hilda Reich, soprano.
  8 p. m.—Baseball results.
  8:05 p. m.—Walter Schuster, tenor; John
  Loesch, violinist.
  9 p. m.—"Character.

TUESDAY, MAY 18

WEDNESDAY, MAY 19

MAY 18
Luna's
Dance music
WGY Orchestra
Vincent Lopez
Dance music
El Patio
Billy Hay's
Vincent Lopez
Wayside
Vincent Lopez
S. S. Leviathan
George Olsen's
E. Golden's
Vincent Lopez
Arrowhead Inn
Connies's Inn

Dance music
Raiberne
Woodmansten
St. George's
Arcadia
Jolly Frolickers
Roseland

Dance music S. S. Leviathan

TUESDAY,
WEBJ 273
WODA 224
WGY 380
WPG 300
12 WHN 361
WIP 508
WCAU 278
WEAF 492
WBZ 333
WFI 393
WMSG 213
WMSG 213
WMSG 213
WMCA 341
WPG 300
WGBS 316
WFBH 273

WFBH 278
WEBJ 278
WMCA 341
WNYC 526
WLIT 395
WGBB 244
WHN 361
WOO 508
WMSG 218
WOR 405
WFBH 273

- 6:15 p. m.—Bill Wathey, "Sports." 6:30 p. m.—News bulletin, 6:40 p. m.—Bretton Hall String Quartet, 1190k—WGCP—NEWARK—252m p. m.—Anshaw Harmony Giris,
  p. m.—Anshaw Harmony Giris,
  p. m.—Anita Alva, soprano.
  15 . m.—Alice Rincy, violinist; Lillian
  Spitzer, pianist; Florence Yordy, soprano.
  1340k—WODA—PATERSON—224m K-kilocycles 830k-WHN-NEW YORK-361m 2:30-1 p. m.—Loew's organ recital. -3:10 p. m.—Loew's overture and vaud
  - 1340k-WODA-PATERSON-224m
    2 noon-Dance music; songs.
    p. m.—Musicale.
    30 p. m.—News; sport talk.
    30 p. m.—Jimmie Love's Orchestra.
    330 p. m.—Ernie Furno's Syncopators.
    p. m.—Dance music.
    30 p. m.—Phyllis Harris, soprano.
    345 p. m.—Paterson Melody Four.
    0:15 p. m.—Billy Oliver, tenor.
    11:30 p. m.—Clifford Lodge Frolic.
  - 590k-WOO-PHILADELPHIA-508m 1 a. m.—Grand organ. 2 noon—Luncheon music, :45 p. m.—Grand organ; trumpet :30 p. m.—Philadelphia Sesquicer 760k—WLIT—PHILADELPHIA—395m
  - 11 a, m.—Organ recital.
    12:20 p, m.—Religious service.
    12:35 p, m.—Concert orchestra.
    2 p, m.—Concert orchestra.
    2:30 p, m.—Republican Women sylvania; artist recital. 30 p. m.—Dream Daddy. 50 p. m.—Plays reviewed. 590k-WIP-PHILADELPHIA-508m
  - 590k—WIP.—PHILADELPHIA—508m

    1 p. m.—Organ recital.

    3 p. m.—Artist recital.

    6:05 p. m.—Monte Cross, "Oldtimer,"

    6:15 p. m.—Monte Cross, "Oldtimer,"

    6:15 p. m.—Department of Agriculture.

    7 p. m.—Birthday list, violin solos.

    8 p. m.—Dramatic reviews.

    8:10 p. m.—The Cleiste Trio.

    8:50 p. m.—Glee Club of Ursinus College

    10:05 p. m.—Emo's "movie" broadcast.

    10:30 p. m.—El Patio Dance Orchestra.

  - 10:30 p. m.—El Patio Dance Orchestra.

    760k—WFI—PHILADELPHIA—395m

    1 p. m.—Tea room ensemble.

    1:40 p. m.—Tea room ensemble.

    3 p. m.—John De Beuris, clarinet; Adele
    Bates, contralto; instrumental trio.

    6:30 p. m.—Concert orchestra.

    7 p. m.—Dance orchestra.

    7:15 p. m.—Sesquicentennial Exposition.

    8-11 p. m.—Program same as WEAF.

    1080k—WCAU—PHILADELPHIA—278m

    6:30 p. m.—The Parodians' Orchestra. 1030R—W.Al—PHILADELFHIA—2:8m 6:30 p. m.—The Parodians' Orchestra. 7:30 p. m.—Snellenburg Instrumental Trio. 8 p. m.—"The Theater Digest." 8:10 p. m.—The Three Brothers. 8:25 p. m.—Peter Ricci, barytone. 8:45 p. m.—Charles Higgins, Joe Burke.
  - 8:49 p. m.—Charles Arists, songs, 9 p. m.—Kuehnle's Artists, 9 p. m.—Robert Fraser, singer, 10 p. m.—Eddie Malle's Entertainers, 10:30 p. m.—Eddie Malle's Entertainers, 10:30 p. m.—Billy Hays's Orchestra, 10:00k—WPG—ATLANTIC CITY—300m
  - 130 p. m.—Ambassador luncheon music. 6:45 p. m.—Organ recital. 7 p. m.—Frank Gallasi, uke. 1090k—WHAR—ATLANTIO CITY—275m 2 p. m.—Seaside Trio.
  - p. m.—Seaside Trio. :30 p. m.—"Glimpses Through the Stage
  - 100 p. m.— Gimpses Through the Stage Door,"

    8 p. m.—Seaside Trio.

    790k—WGY—SCHENECTADY—380m

    12:30 p. m.—Market reports.

    2 p. m.—Music; one-act play.

    2;30 p. m.—Organ recital.

    6 p. m.—Stock reports; news items.

    6:30 p. m.—Dinner program.

    7:30 p. m.—Address, "Greek Science."

    7:30 p. m.—Address, "Greek Science."

    7:45 p. m.—WGY Orchestra; Elizabeth Sido p. m.—Cotton quotations.

    Carrigan, contraito.

    880k—WJZ—NEW YORK—4

    1 p. m.—Madison Orchestra:

    4:35 p. m.—News service.

    4:35 and 7:30 p. m.—Baseball sep. m.—Wyour Daily Menu."

    4:15 p. m.—Health Speakers Bure

    4:35 p. m.—Health Speakers Bure

    4:35 p. m.—Waldorf-Astoria tea. ct.

    5:32 p. m.—Waldorf-Astoria tea. ct.

    5:32 p. m.—Cotton quotations.

    5:30 p. m.—Cotton quotations.

    5:40 p. m.—Cotton quotations.

    5:50 p. m.—Farm market reports.

    7 p. m.—New York University.

    7 p. m.—New York University.

    7 p. m.—New Tork University.

  - 1080k—WHAM—ROCHESTER—278m
    4:30 p. m.—Eastman Theater organ.
    6 p. m.—Recital.
    7:50 p. m.—Weather forecast; markets.
    8 p. m.—Dinner concert from Powers Hotel
    10:30 p. m.—Beaver Hour."
    980k—WJAR—PROVIDENCE—306m
    1:05 p. m.—Bittmore Concert Ensemble.
    7:30 p. m.—Musical program.
    8 p. m.—Grand Prize Eurekas.
    8:30 p. m.—Gold Dust Twins.
    9 n. m.—Eveready hour.
  - bers.
    p. m.—Luncheon concert.
- 1 p. m.—Luncheon concert.
  4 p. m.—Incidental music to the feature picture, "Fascinating Youth."
  6 p. m.—The Smilers.
  6:30 p. m.—Unioner dance.
  7:35 p. m.—"Homes Comfortable."
  8 p. m.—The Graydon Trio.
  8:30 p. m.—Eleanor Hayden, chimes.
  8:50 p. m.—Organ recital.
  9:45 p. m.—Crescent Gardens Orchestra.
  860k—WEEI-BOSTON—349m
  12 noon—Keith's Radio Review. 12 noon—Musical program.
  1390k—WRST—BAY SHORE—216m
  9-10 p. m.—Central Islip State Hospital
  Orchestra.

  9:45 p. m.—Crescent Gardens Orchestra
  860k—WEEI—BOSTON—349m
  12 noon—Keith's Radio Review.
  2 p. m.—Ernie Andrews's Troubadours.

  - 1120k—WTAG—WORCESTER—268
    10:30 a. m.—Musical selections; talk.
    12:05-2 p. m.—Luncheon music.
    5:15 p. m.—Story teller.
    7:45 p. m.—Interesting talk.
    8-8:30 p. m.—"The Grand Prize Eure
    8:30-9 p. m.—Topics from United St
    history.
    9-11 p. m.—Program from WEAF.
- Dance Orchestras for This Week Lorraine Grill Jack Myers's Ed Andrews's WGY Orchestr Brunswick Buffalonians
  - 455 278 349 380 333 492 278 469 306 319 213 273 492 WHAM WCAP WJAR WGR WMSG WFBH WEAF Oberdach Dance music Prov.-Biltmore Vincent Lopez S. S. Leviathan Connies's Inn Ben Bernie's SATURDAY, MAY 22
  - William Pike's Ben Bernie's Phil Lawrence's Phil Lawrence's
    Carroll's
    W. S. Tupman's
    Dance music
    Vanity
    Vanderbilt
    Dance music
    Dance music
    Arrowhead Inn
    S. S. Leviathan
    E. Golden's
    Dance music

- dress. 9:30 p. m.—Sacred song half hour. 10 p. m.—KIKA Little Symphony Orchestra 12:35 a. m.—Concert from Grand Theater 250k—WCAE—PITTSBURGH—461m
- WEDNESDAY 610k—WEAF—NEW YORK—492m 45, 7 and 7:20 a, m.—"Tower Health Ex-
  - 6:10k—WEAF—NEW YORK—49Zm
    6:25, 7 and 7:20 a. m.—Tower Health Ex7:45-8 a. m.—Morning Prayer Services.
    11 a. m.—Marie Houston, soprano.
    11:30 a. m.—Services.
    12 noon—Market and westher reports.
    4 p. m.—Townond Maher spritch planiat.
    4:15 p. m.—Iessie Haywood reader.
    4:30 p. m.—Marie Smith, planiat.
    4:45 p. m.—Wisc and Musical Appreciation for Children, "Katheen Bowden,
    6 p. m.—Dinner Music.
    6 p. m.—Dinner Music.
    7 p. m.—Wisc and Musical Appreciation for Children, "Katheen Bowden,
    10:30 p. m.—Marie Merkett contralto.
    10:30 p. m.—Marie Merkett contralto.
    10:30 p. m.—Castleton Instrumental Trio.
    10:30 p. m.—Marie Merkett contralto.
    10:30 p. m.—Marie Merkett contralto.
    10:30 p. m.—Marie Merkett contralto.
    10:30 p. m.—Story Teller.
    10:40 p. m.—Wisc and Musical Appreciation for Children, "Katheen Bowden,
    10:40 p. m.—Wisc and Musical Appreciation for Children," Katheen Bowden,
    10:40 p. m.—Wisc and Musical Appreciation for Children," Katheen Bowden,
    10:40 p. m.—Wisc and Musical Appreciation for Children, "Katheen Bowden,
    10:40 p. m.—Wisc and Musical Appreciation for Children," Katheen Bowden,
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    10:40 p. m.—Wisc and Musical Appreciation for Children," Katheen Bowden,
    10:40 p. m.—Wisc and Musical Appreciation for Children," Katheen Bowden,
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    10:40 p. m.—Wisc and Musical Appreciation for Children," Katheen Bowden,
    10:40 p. m.—Wisc and Musical Appreciation for Children," Katheen Bowden,
    12:40 p. m.—Wisc and Musical Appreciation for Children," Katheen Bowde

    - . m.—Knickerbocker Trio.
      . m.—Leroy Montsanto.
      . p. m.—Study program.
      . p. m.—Radio Macks.
      . p. m.—The Rover Reciter.
      . m.—Andy Razof and Paul Deniker.
      . m.—Andy Razof and Paul Deniker.
  - 10:30 p. m.—Orchestra.

    660k—WJZ—NEW YORK—455m

    1 p. m.—Madison Orchestra.
    2 p. m.—News service.
    4:30, 5:30, 7:30, 10:30 p. m.—News service
    4:4:35 and 7:30 p. m.—Baseball scores.
    4 p. m.—Your Daily Menu."
    4:15 p. m.—Butterick Fashion Talk.
    4:25 p. m.—Heath Speakers Bureau.
    4:35 p. m.—Waldorf-Astoria tea concert.
    5:32 p. m.—Market quotations.

  - 3:40 p. m.—New York Visitors' Association.

    5:40 p. m.—Uncle Geebee.

    6:30 p. m.—Fess Williams's orchestra.
    7 p. m.—Senator William J. Love. "Medical Legislation From the Inside."
    7:10 p. m.—Fess Williams's orchestrs.
    1250k—WHAP—NEW YORK—240m
    6:30 p. m.—Holmes's String Ensemble.
    7:10 p. m.—Winifred Bauer, planist.
    7:40 p. m.—Joseph Cashman, "Radicalism."
    8 p. m.—Joseph Cashman, "Radicalism."
    8 p. m.—WHAP Madrigal singers.
    8:15 p. m.—Fanklin Ford, news digest.
    8:35 p. m.—Marion Kener, soprano.
    Phyllis Kraeuter, cellist; Earl Palmer, tenor.

    9:10 p. m.—Hickman Price, speaker.
  - :30-3:10 p. m.—Metropolitan overture an vaudeville.
    :10 p. m.—News and sports.
    :45 p. m.—Frances Capouilliez, baryton.
    :10 p. m.—Frank Degnan, songs.
    :30 p. m.—Uncle Robert's Pals.
    p. m.—News and Sports.
    :10 p. m.—Lulu Quinn Weyant, songs.
    :30 p. m.—Murray Lee's Bardsmen, p. m.—Kathryne Walters, soprano.
    :15 p. m.—Loew's organ recital.
    :15 p. m.—Loew's organ recital.
    :15 p. m.—Entertainers.
    :10 p. m.—Entertainers.
    :10 p. m.—Palisades Park Orchestra.
    :130 p. m.—Palisades Park Orchestra.
    :130 p. m.—Palisades Park Orchestra.
    :130 p. m.—Dance orchestra.
    :130 p. m.—Dance orchestra.
    :130 p. m.—Harman Neuman, planist.
  - m.—Herman Neuman, planist.
    p. m.—Market high spots.
    p. m.—Piano selections.
    p. m.—Elementary Spanish less
    n.—Advanced Spanish lessons. p. m.—Police alarms. p. m.—"Tren of the Times."
  - Alex. duP. Coleman.
    50 p. m.—John Biggs, flutist.
    10 p. m.—Chorus of the Y. W. C. A.;
    Sylvia Solow, violin soloist.
    40 p. m.—St. George Society Orchestra.
    0:30 p. m.—Police alarms: weather.
    1100k—WIBH—NEW YORK—273m 130 p. m.—Police alarms: weather.

    1100k—WFBH—NEW YORK—278m
    p. m.—Black Diamond Sernaders.
    p. m.—Studio program.

    130 p. m.—"Hour of Meditation."
    p. m.—Bobby Brandies. composer.

    15 p. m.—Bobby Brandies. composer.

    15 p. m.—Bobby Brandies. composer.

    15 p. m.—George Ward, recitations.

    145 p. m.—Joe Perney, soprano.
    p. m.—Interstate Orchestra.

    145 p. m.—Black Birds of Harmony.
    p. m.—Abbey Orchestra.

    145 p. m.—Secrets of Beauty." E. Weiss.
    p. m.—Majestic String Ensemble.

    130 p. m.—Castillian Royal Orchestra.

    130 p. m.—Convillian Royal Orchestra.

    1160k—WRNY—NEW YORK—256m
    1 a. m.—Women's hour.
    2 noon—Bob Schaefer, songs.

    12:15 p. m.—Pollock and Dorn, songs.

640k—WRC—WASHINGTON—469m

11:55 a. m.—Arlington time signals.
12 noon—"Fifty Farm Flashes," under the auspices of the Department of Agricultire.
12:20 p. m.—Organ recital from the studios of the Homer L. Kitt Piano Company.
10 p. m.—Hotel Washington Orchestra, Irving Boernstein directing.
17 p. m.—Hotel Washington Orchestra, Irving Boernstein directing.
18 p. m.—Radio School of International Relations.
17:30 p. m.—"Gems of Romance," broadcast jointly with WJZ from New York.
18 p. m.—To be announced.

12:45 p. m.—Norman Secon, planist.
16:15 p. m.—Frisher's Indiana Trio.
17 p. m.—Frotestant Circle.
17 p. m.—Protestant Circle.
17 p. m.—Sadio Theater index.
17:20 p. m.—Studio artist,
17:20 p. m.—Warren Burns, harmonica.
17:45 p. m.—Warren Burns, harmonica.
18:15-10:30 p. m.—Charles Isaacson's cocert at De Witt Clinton Hall.
18:16-10:30 p. m.—Charles Isaacson's cocert at De Witt Clinton Hall.
18:16-16:15 p. m.—Norman Secon, planist.
19:16-15 p. m.—Frotestant Circle.
19 p. m.—Sport rays.
19:10 p. m.—Charlet rindex.
19:10 p. m.—Smallo Theater index.
19:10 p. m.—Studio artist,
19:10 p. m.—Warren Burns, harmonica.
19:10 p. m.—To be announced.
19:10 p. m.—Frotestant Circle.
19:10 p. m.—Frotestant Circle.
19:10 p. m.—Sport rays.
19:10 p. m.—Frotestant Circle.
19:10 p.

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- \$\frac{1}{6} \text{ p. m.}\$—Melodyland Orchestra.

  7 \text{ p. m.}\$—Review of sports.

  7 \text{ p. m.}\$—Busy Beavers.

  8 \text{ p. m.}\$—Busy Beavers.

  9 \text{ p. m.}\$—Smith Family Rolling.

  9 \text{ p. m.}\$—Busy Beavers.

  10 \text{ p. m.}\$—Cash; credit hour.

  10 \text{ p. m.}\$—Cash; credit hour.

  10 \text{ p. m.}\$—Bill McWalters. songs.

  740R—WOR—NEWARK—405m

  6.445-715-7:45 \text{ a. m.}\$—Gym class.

  2 \text{ 30 p. m.}\$—Len Saxon, tenor.

  2 \text{ 45 p. m.}\$—Lulu Weyant, entertainer.

  8 \text{ p. m.}\$—Len Saxon, tenor.

  3 \text{ p. m.}\$—Len Saxon, tenor.

  3 \text{ p. m.}\$—Oreste's Queensland Orches

  650R—WCAE—PITTSBURGH—461m

  650R—WCAE—PITTSBURGH—461m

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  650R—WCAE—PITTSBURGH—461m

  650R—WCAE—PITTSBURGH—461m

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  650R—WCAE—PITTSBURGH—461m

  650R—WCAE—PITTSBURGH—461m

  650R—WCAE—PITTSBURGH—461m
- 12:30 p. m.—Market reports.

  2 p. m.—Music; one-act play.

  2:30 p. m.—Organ recital.

  6 p. m.—Stock reports; news items.

  6:30 p. m.—Olinner program.

  7:45 p. m.—WGY Orchestra; Elizabeth

  6:30 p. m.—Deltan half hour of romance,

  "Jade."

  9 p. m.—WGY Ochestra; Elizabeth

  Carrigan, contralto.

  8:30 p. m.—Deltan half hour of romance,

  "Jade."

  9 p. m.—WGY Ochestra; talk.

  10 p. m.—"Forand Tour—Scandinavian

  Capitol."

  10:30 p. m.—Buser Hour," musical program.

  940k—WGR—BUFFALO—319m

  11 a. m.—Home economics talk.

  6:30 p. m.—Dinner music.

  6:31 p. m.—Buser Hour," musical program.

  1130k—WMAR—BUFFALO—266m

  6:15 p. m.—Buser Bureau.

  4:25 p. m.—Health Speakers' Bureau.

  5:40 p. m.—Stort orders' Bureau.

  5:40 p. m.—Stort orders' Bureau.

  4:25 p. m.—Health Speakers' Bureau.

  5:50 p. m.—Health Speakers' Bureau.

  6:10 p. m.—
  - 8:40 p. m.—Clarence Williams's Trio.
    9 p. m.—Buson's Neapolitans.
    9:25 p. m.—McLean's Dance Orchestra.
    950k—WGBS—NEW YORK—316m
    10-11 a. m.—Louise Rice, woman's hour:
    Jeanette Eberhard, soprano.
    1:35 p. m.—Mildred Marsh, soprano.
    1:45 p. m.—Mildred Marsh, soprano.
    1:45 p. m.—Mildred Marsh, Ethel Alexander.
    2:15 p. m.—Beatrice Cowie, contraito.
    1:230 p. m.—Special camping program.
    3:30 p. m.—Special camping program.
    3:30 p. m.—Harry Reese, songs.
    3:40 p. m.—New York Visitors' Association.
    6 p. m.—Long Gebee.
    6:30 p. m.—Fess Williams's orchestra.
    7 p. m.—Senator William J. Love, "Medi-Tribate Alexanders and the state of the
- 2 p. m.—Ernie Andrews's Troubadours.
  4:15 p. m.—Ye Middleton Arms Orchestra.
  6:20 p. m.—George Joy, Nell Cantor, songs.
  6:20 p. m.—Big Brother Club.
  7:30 p. m.—Minute Men.
  8-11 p. m.—Big Brother Club.
  8 p. m.—Degram from WEAF.
  900k—WHX—SPRINGFIELD—338m
  7:45 p. m.—Bob Patterson's Trlo.
  8 p. m.—Deerfield Academy Glee Club.
  10 p. m.—WBZ Movie Club.
  10:30 p. m.—Wayside Dance Orchestra.
  1120k—WTAG—WORCESTER—268m
  1120k m.—Miscal selections; talk.
  1120k m.—Instead organ.
  112 n. m.—Grand organ.
  112 n.
  - 10 p. m.—Arcadia Dance Orchestra.
    590k—WIP—PHILADELPHIA—508m
    7 a. m.—Steting-up exercises.
    10:30 a. m.—Reducing exercises.
    1 p. m.—Luncheon music.
    3 p. m.—Shapp Instrumental Trio.
    6:05 p. m.—Benjamin Franklin Concording
  - orchestra.

    p. m.—Birthday list; Astor Singing Club.

    760k—WFI—PHILADELPHIA—395m

    p. m.—Rotary Club luncheon.

    p. m.—Kinder Symphony Orchestra; the
    Hazel Vocal Trio.

    30 p. m.—Concert orchestra. Hazel Vocal Trio.

    1:30 p. m.—Concert orchestra.

    7 p. m.—Dance orchestra.

    1080k—WCAU—PHILADELPHIA—278m 1080k—WCAU—PHILADELPHIA—278m
    7:30 p. m.—Snellenberg recital.
    8:10 p. m.—Joe Murphy, Plano Phiend.
    9:8:30 p. m.—Miller plano period.
    9 p. m.—Gol-Mar Greeters.
    9:30 p. m.—Helen Travis Hoel, soprano.
    9:45 p. m.—Senator Hassenpfeffer.
    9:50 p. m.—Agnes Everts, soprano.
    10 p. m.—Instrumental trio.
    10:30 p. m.—Carl Zoehrns, Lou Hirsch songs.
  - 10:30 p. m.—Carl Zoenrns, Lou Ansterds songs.

    10:45 p. m.—Frank Cook, songs.

    11 p. m.—Artie Bittong's Cheer-Ups.

    790k—WGY—SCHENECTADY—380m.

    12:30 p. m.—Report.
    6 p. m.—Stock reports; news; scores.
    6:30 p. m.—Children's bedtime ftory.
    7 p. m.—'Book of Knowledge.'
    7:30 p. m.—Book of Knowledge.'
    8:30 p. m.—Eastman Theater Orchestra
    9 p. m.—Euterpe Glee Club.
    110 n. m.—Musical program. 9 p. m.—Euterpe Giee Citto, 10 p. m.—Musical program, 940k—WGR—BUFFALO—319m 3:30 p. m.—Two plano recital, 3 p. m.—Jointly with Station WEAF, 3:30 p. m.—Vocal and plano recital, 9 p. m.—Jointly with WEAF, 10 p. m.—The Hour of Kinga."

11 p. m.—Barytone recital.
1080k—WHAM—ROCHESTER—278m
4:30 p. m.—Eastman Theater Organ.
8:25 p. m.—Weather; market report.

5

- 8:30 p. m.—Eastman Theater Orchestra, 9 p. m.—Euterpe Glee Club. p. m.—Concert by instrumental trio.

  1130k—WMAK—BUFFALO—266m

  30 to 10:80 p. m.—Virial and the control of the c 7:30 to 10:30 p. m.—Musical programs. 980k—WJAR—PROVIDENCE—306m solk—WJAR—FROVIDENCE—306m

  1:05 p. m.—Al Billincoff's Orchestra.

  1:05 p. m.—Two in One Man. the Shinola Boys.

  1:05 p. m.—Two in One Man. the Shinola Boys.

  1:05 p. m.—Musical program.

  1:05 p. m.—Tablold Musicale.

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  1:05 p. m.—Tablold Musicale.
- 7:30 p. m.—"Gems of Romance," broad-cast Jointly with WJZ from New York.

  5 p. m.—To be announced.

  9:30 p. m.—To be announced.

  9:30 p. m.—To be announced.

  9:30 p. m.—Dinner orchestra.

  12:30 p. m.—Dinner orchestra.

  12:30 p. m.—WBAL Sandman Circle.

  9 p. m.—Musical program by artists.

  10 p. m.—WBAL Male Quartet.

  11:30 p. m.—Carl Smith, barytone.

  9:00 p. m.—WBAL Male Quartet.

  11:30 p. m.—Clordy winkum.

  9 p. m.—Dinner concert.

  12:30 p. m.—Employment opportunities, lower program by artists.

  10 p. m.—Carl Smith, barytone.

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  10 p. m
  - 10:30 p. m.—Musical progrom.
    2 midnight—McAlpin Entertainers.
    360k—WEEI—BOSTON—349m
    12 midnight—McAlpin Entertainers.
    1410k—WMSG—NEW YORK—213m
    6 p. m.—Cameo Recording Artists.
    6:45 p. m.—Sue Schwartz, H. Steiner, songs.
    7 p. m.—Sport talk
    7:15 p. m.—Frances Sper, songs.
    7:30 p. m.—May Breen, Peter de Roses
    8 p. m.—William Baker's Orchestra.
    8:30 p. m.—Harry Kirsch.
    8:45 p. m.—Lillian Bradley's Radio Chums.
    9:30 p. m.—Harry Kirsch.
    8:45 p. m.—Lillian Bradley's Radio Chums.
    9:30 p. m.—Mary Killoran, soprano.
    10 p. m.—Val and Plotti.
    10:30 p. m.—S. S. Leviathan Orchestra,
    104:—WLWI—NEW YORK—288m
    9 p. m.—'Economics and Finance," by
    K. of C.
    9:15 p. m.—Nina Weissman, soprano; Al12:05-2 p. m.—Luncheon music.

    - ture.

      2:20 p. m.—Organ recital from the studios of the Homer L. Kitt Plano Company.
      p. m.—Irving Boernstein's Hotel Washington Orchestra.

      1:15 p. m.—Meyer Davis's Le Paradis Band broadcast from the Cafe le Paradis.
      p. m.—"Housekeepers' Half Hour." by Dorothy Townsend.

      2:20 p. m.—Musical program.

      970k—KDKA—PITTSBURGH—309m.
    - 6:30 p. m.—Dinner concert.
      7:20 p. m.—The KDKA Mailbox.
      9 p. m.—Stockman Farmer news.
      9:15 p. m.—University of Pittsburgh ad-

### THURSDAY

- 660k-WJZ-NEW YORK-455m 660k—WJZ—NEW YORK—455m

  1 p. m—Pennsylvania luncheon music,
  2:30 p. nn.—Weather: News Service,
  4:30, 5:30, 7:30, 10:30 p. nn.—News,
  4:25, 7:30 p. m.—Baseball scores,
  4 p. m.—'Your Daily Menu.''
  1:5 p. m.—Weatl Paper Room by Room.
  4:25 p. nn.—Meat council talk,
  4:35 p. nn.—Commodore tea music,
  5:32 p. nn.—Meat council talk,
  5:32 p. nn.—Fanacial summary,
  5:40 p. nn.—Cotton quotations,
  5:35 p. nn.—Financial summary,
  5:40 p. nn.—Cotton quotations,
  7:30 p. nn.—Farm market reports,
  7 p. nn.—Vanderblit Orchestra.
  7:30 p. nn.—Judge jr.
  8 p. nn.—Voice of the silent drama—First
  National presentation, "The Wise Guy."
  8:30 p. nn.—Salon Orchestra.
  10:30 p. nn.—Salon Orchestra.
  10:30 p. nn.—The Record Boys,
  11 p. nn.—Freddie Rich's Orchestra.
  6:10k—WEAF—NEW YORK—482m

- 10:30 p. m.—The Record Boys.

  11 p. m.—Freddel Rich's Orchestra.

  610k—WEAF—NEW YORK—492m

  6:45-7-1:20 a. m.—Health exercises.

  7:45 a. m.—Prayer services.

  11 a. m.—Henry Boyd, whistler.

  11:10 a. m.—Talk, Helen Whitson.

  11:25 a. m.—Henry Boyd, whistler.

  11:40 a. m.—Talk, by Grace Hall.

  12 noon—Market and weather reports.

  4 p. m.—Dorothy Rumage, soprano.

  4:15 p. m.—Bernard Ahrens, barytone.

  4:30 p. m.—Bernard Ahrens, barytone.

  4:45 p. m.—'Turtles and Tortoises,'' Ada.

  Mellen.

  5 p. m.—Dinner music.

  6 p. m.—Dinner music.

  7 p. m.—Mid-Week Hymn Sing.

  7:30 p. m.—Winers a Good Book to Read, \*\*
  Thomas Masson.

  8:15 p. m.—'Whires Harvesters.''

  9 p. m.—'Clicquot Club Eskimos.''

  10 p. m.—'Silvertown Cord Orchestra.

  11-12 p. m.—Vincent Lopez's Orchestra.

  1430k—WBNY—NEW YORK—210m
- 11-12 p. m.—Vincent Lopez's Orchestra.

  1430k—WBNY—NEW YORK—210m

  7 p. m.—Knickerbocker Trio.

  8 p. m.—Blue Bird Orchestra.

  8:30 p. m.—Vincent Moore, songs.

  8:45 p. m.—Ona Welsh, songs.

  9:45 p. m.—Ona Welsh, songs.

  9:15 p. m.—Loretto Reynolds, planist.

  10 p. m.—Blue Bird Orchestra.

  10:30 p. m.—Studio program.

  10:45 p. m.—Blue Bird Orchestra.

  9:50k—WGBS—NEW YORK—316m

  10 a. m.—Timely Talks with Terese.

  10:15 a. m.—Joseph Plouffe, tenor.

  10:15 a. m.—Radio gym class; tenor solos.
- 10:10 a. m.—Joseph Plouffe, tenor.
  10:15 a. m.—Radio gym class; tenor solos.
  10:35 a. m.—Better Homes and Gardens."
  1:30 p. m.—Scripture reading.
  1:35 p. m.—Marguerite Sterns, soprano; Beulah Le Verde Duffy, planist.
  3 p. m.—Special Camp Week program.
  3:30 p. m.—Woman in the Home Hour 6 p. m.—Uncle Geebee.
  6:30 p. m.—What the World Is Doing."
  6:45 p. m.—George Hall's .Arcadians; William Pike's Orchestra.
  7:30 p. m.—Seville Orchestra; Lulu Weyant, songs.
  8 p. m.—'Gems from Ingersoll' Joseph Lewis.
  8:10 p. m.—Elsa Clement, folk songs.
  8:30 p. m.—'Tootlight and Lamplight."
  9 p. m.—Hourd Manuel Compinsky, 'cello and violin duets.
  9:30 p. m.—Old time ministrels.
  10:30 p. m.—'EMO," Harry Hershfield, Milt Gross, Max Fleischer and Jimmy Hussey, in "A Jewish Poker Game."
  10:45 p. m.—'Black Birds of Harmony."
  1160k—WRNY—NEW YORK—258m
  11 a. m.—Art appreciation.
  11:15 a. m.—Joseph Arens, violin; Bernard Honti, barytone.
  2:15 p. m.—Book review.
  6:45 p. m.—Jewish Circle.
  7 p. m.—Frances Peper, soprano.
  12:30 p. m.—Frances Peper, soprano.
  12:35 p. m.—Book review.
  6:45 p. m.—Jewish Circle.
  7 p. m.—Frank Garbarini, accordion.
  7:15 p. m.—Radio questions and answers.
  7:30 p. m.—Camps and resorts.
- 7 p. m.—Frank Garbarini, accordion.
  7:15 p. m.—Radio questions and answers,
  7:30 p. m.—Camps and resorts.
  8 p. m.—Ben Bernie's Orchestra.
  8:30 p. m.—Rock Ferris's organ recital,
  9 p. m.—"Potash; the Great Desideratum," Dr. T. O'Conor Sloane.
  9:15 p. m.—Virginia's Colombati's Hour.
  9:45 p. m.—Frances Sper, songs.
  10 p. m.—Volga Trio, Around the world
  in music.

in music. 10:30 p. m.—Win Unger's Entertainers. (Continued on next page)

### **MATEUR** IZICKBACKS BY EVERETT M.WALKER-7/COM

taken place during the last week mark the advent of the new radio season for the year 1925-'26-a year that promises from all evidence to be one

of the industry, the amateur has not

great World War. Although many ible wire, commonly called pigtails, family. members of this clan have become for these movable contacts is to be active and then lost interest, there highly recommended as well worth take the following forms:

to make a low-power tube transmit- may or may not be insulated; it difficult to install on many instru-tained. lengths; that is, below fifty meters. Toward the close of the best weather for distant communication the amateur was just beginning to learn the peculiarities and the difficulties of short-wave communication.

The amateur is, in most cases, hampered due to the lack of funds. For this reason he often has to construct his own apparatus, which, with the exception of those pieces which cannot be made in the amateur workshop, such as tubes, etc., makes the problem even more difficult. Therefore the amateur transmitter is usually a makeshift affair.

These are only a few of the difficulties he faces. Another of his greatest problems is the lack of space to erect an antenna best adapted for his particular purpose. Still, when one thinks of the remarkable records that were made by amateurs using such apparatus last winter and spring he has to stop and wonder how it

One of the greatest accomplishments of amateur radio last year was the establishment of two-way communication between both coasts of the continent during broad daylight. Although this is not the greatest achievement accomplished by the "ham," it is one that will stand out in the history of radio. It literally opened the eyes of the commercial companies, and since then several of them have erected huge short-wave stations for trans-Atlantic communi-

Now that the amateur knows the "tricks" of short-wave communication, this winter ought to be a "humdinger" for radio. By this we do not mean that he knows all the tricks of high-frequency transmission, for there is still a great deal to be learned-experimentation has only just begun. But this year will afford an excellent opportunity for him to carry out the work which was started a year ago. If every amateur will cooperate with his fellow amateur and exchange ideas and tell what he has accomplished there will, without a doubt, be an innumerable number of pages added to amateur history.

ardent sup porter of the use of high waves for amateur communication. This station may be heard quite regularly on 185 meters.

After being silent for several months 2AWV is back on the air again. He is equipped to use either CW, ICW or phone. The operator at AWV is one of the oldtimers.

We have listened on the 80, 40 and 20 meter wave bands now assigned to amateur radio for the purpose of trying to determine which has the greatest number of stations operating. Had it been a year ago the 80-meter band would have won with an overwhelming majority, but this year there are more amateurs operating on forty meters. We wonder whether the 20-meter band will be the popular one next year. There are a few stations using this latter band, but most of them belong to the experimental class and, so far as we know, little traffic is being handled.

Although every amateur may pick out a band that seems best adapted for his particular purpose, it seems to us that it is a good plan to construct a transmitter capable of being operated on as many as possible.

## Pigtails Increase

Although the radio shows tend to are a frequent source of noise and favor the radio broadcasting branch trouble. The connection may seem been neglected. Amateur radio is one variometer is inspected in the shop, to rotice scratching and rasping ages if the rotor be moved too far dial, but rather crude looking. The amateur is one of the mainnoises upon turning the dials, which To prevent this we should limit the stays of the art, and it is he who is are due to loose or corroded contacts motion of the dial to not more than groove cut into its back, the ends of largely responsible for present-day resulting from the inevitable wear one complete revolution; a half revo-which strike a hidden stop-pin in radio broadcasting. Contrary to the and tear, oxidation, etc. There are lution, or 180 degrees, is just as satisthe track of the groove. belief of many radio fans, solely inenough unavoidable noises about any
factory and often simpler to obtain.

5. Special forms of dials, such as terested in the listening to radio radio without permitting such as This can be done in several ways. broadcasting, the transmitting amathese to continue, especially since While it is possible to rely on one's which have other desirable features. teur was interested and active in the they represent a decided lowering of memory and simply form the habit

Require Stops The two ends must be soldered, of shaft. course. It is essential that the solder 2. A projection on the shaft strik-cast by WEAF, WOO and WCAE.

Last year the amateur learned how is especially satisfactory. The wire commercial practice, but it is rather the most helpful ideas can be ob-

need not be unless two leads are to ments without adequate tools and Concert by Saxophonist Whose be trought out very close to each considerable skill, as the projection Efficiency, but other, which is generally poor pracusually takes the form of a small tice.

penetrate the strands thoroughly to ing stop-pins fastened to the back He is a feature recording artist, a make a good joint. The usual pre- of the panel. This is sometimes sim- well known orchestra leader and has cautions of absolute cleanliness, a pler for certain types of instruments. appeared in concert recitals through-Friction, spring or pressure con- hot and well-tinned iron and a mini- The projection could be a small strip out the country. His numbers will of the greatest yet to be witnessed tacts between the movable and stamum of some good non-corrosive flux of bakelite with a hole in one end, be "Saxonola" and "Waltz Hilda," forced over the shaft and cemented with a popular selection as an encore.

of the dial and limited by stop-pins including "Pizzicato," from Delibes's It is obvious that the pigtails are on the front of the panel. This is "Sylvia"; "Rustle of Spring," three of the most interesting and fascinatbut after a period of use we begin liable to be twisted off their anchorbut after a period of use we begin liable to be twisted off their anchordial but rether crude looking.

field long before broadcasting was initiated. As a matter of fact, the and the possible loss of DX.

They represent a decided lowering of never going beyond the numbered portion of the dial, it is not the of motion. Conditions vary so much portion of the dial, it is not the of motion. Conditions vary so much amateur was active long before the Substituting short lengths of flex- safest way, especially in the average that it is impossible to state that Positive stops are better and may many other possibilities which should radio announcers on the staff of any one scheme is best. There are still remains a large number of those the trouble. To be flexible the wire 1. A projection on the shaft which flection, especially if one carefully at that station at 10:20 a. m. Thurswho are charter members of the framust be stranded, the finer the strikes one or two stop-pins mounted studies the interior of several high day, to be known as "The Song Facstrands the more so. Braided wire on the instrument. This is the usual grade manufactured sets, from which tory." Clark will sing some of his

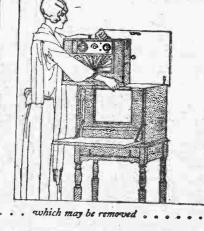
Identity Is Not Revealed peer of saxophonists will be featured in the "Pooley Period" on

contact, but some mechanical consid- 3. A small pin driven into the edge be music furnished by a string trio,

some of the geared vernier dials, The identity of the soloist is not re-

Inaugurates 'Song Factory'







The illustration shows the portable Oper-

adio in the cabinet from which it may be

removed in one minute's time and used

in any part of the house or wherever you

go. For those who want a compact set for

able in a distinctive semi-portable mahog-

Prices without tubes or bat-

teries, Portable \$160; Con-

solette\$180; Tudor Cabinet

(for housing portable) \$68.

The Operadio idea was con-

ceived sixteen years ago when J. M. Stone built the first

successful self-contained radio

receiving set, using a kite to

carry the aerial wire aloft.

The accompanying sketch

was made from a photograph taken in 1909

any case-the Consolette.

home use only, the Operadio also is avail-





### Everything any radio can offer plus advantages no other set affords

Die and so convenient that it may be enjoyed anywhere-indoors or out, upstairs or down.

That is the Operadio - a complete, compact, self-contained receiver with loudspeaker, six tubes, batteries, loop and all parts fitted into a case of unbelievably compact proportions. No aerial or outside connections of any kind are required.

A single hearing will convince you that its performance is far ahead of any radio set you have ever heard. Performance of such superb quality and reliability

Radio of the finest quality. Simple, that the Drake, Roosevelt, Ben Franklin and many other leading hotels chose this set for the entertainment of their guests.

The portable Operadio in its extremely smart carrying case is complete in itself and harmonizes with the most beautiful surroundings. In this form it is now being used in thousands of homes.

And for those who desire it, the distinguished walnut cabinet shown above is available for housing the set in the home—thus combining the beauty of a furniture model with the convenience of absolute portability.

THE OPERADIO CORPORATION 8 So. Dearborn St.







For further information call, write or telephone Operadio Sales Corporation, 1476 Broadway (Times Square), New York

## THE NEW YORK HERALD NewYorkswiesaribune RADIO MAGAZINE

SECTION SIX

SUNDAY, SEPTEMBER 20, 1925

## Bob's Class Buys a Radio Receiving Set

The School's Entertainment, Staged to Raise Money for a Receiver, Was Broken Up by a Boy's Prank, but Was a Financial Success

By H. L. VAN DEUSEN



"Stop that noise at once!' cried Miss Osgood, but no one could hear her on account of the girl's hollering, and spine-shivering sounds seemed to come from the loud speaker."

Sept. 11-Yaller Selgood won't do any | said he had a real talent for lectrocumore squealing on me in school, I bet, even if he is president of the school radio club-Extract from Bob's diary.

ELL, I gotter stay in after school for an hour each day for a month, and all on account of me popping Yaller Selgood on the noodle with a spitball, but I wouldn't mind it so much if me and Billy Rich weren't so busy inventing a new kind of a radio set, and I hated like the dickens losing a hole hour after school when I could put that much time on it.

It was the first day that school opened after the summer vacation, and it was just my luck to get in dutch right off the reel, but you can bet that no feller can squeal on me to the teacher and get away with it without me getting hunk with

Our teacher, Miss Osgood, ain't a bad scout, if she is a teacher, and just before I peppered Yaller with the spitball she had put the proposition up to us about getting a radio set for the school room and organizing a radio club. She said we could hold an entertain-

ment and sell tickets to our parents and friends, and raise a radio fund that way. Yaller he spoke right up and said he would recite a peace. He said his folks

tion. It was then I popped him on the It was a good, juicy spitball, and it

He just stood there blinking his eyes as fast as he could. "What's the trouble, Ralph?" asked Miss Osgood. "Bob plastered me with a spitball,"

spattered in his eye. You'd died laffing.

said he. Then the teacher called me up front and asked me if I had, and of course I wouldn't lie about it, and that's why I

gotter stay after school for a month. After that I lost a lot of interest in our school radio entertainment, but Billy he was down on the program for a peace and Fatty Leonard, who weighs about a ton, was to sing "Oh, for the Wings of a Dove." What he needed was the wings of an airplane. Yaller was down for a

Honest, Yaller has more gall than a whole flock of hens, and thinks he is cut out for a life on the stage. He was down on the program to recite a peace called "Blow, Bugles, Blow!" and to see him strut up on the stage to practice it would give a clothing store dummy a pain in the

I wasn't down on the program for anything, but I had to sell ten tickets anyway because all the rest of them did.

First off I wasn't going to the entertainment at all, but I stopped in Lahl's store for some candy and another feller came in and bought some red pepper for his family, and that gave me an idea.

I had to try a lot of stores before I could get what I wanted, but I got it and told Billy I had changed my mind and would be on hand for the entertainment that night.

Well, the school hall was packed, and I guess there was no doubt about us having enough money for the radio outfit. Billy done real good in his peace, and then they lowered the light as Yaller strutted out on the stage. It was his own idea. He said it would make his lectrocution

more dramatic. It did, but not the way he expected.

As he opened his mouth and spouted, good and loud, "Blow, Bugles, Blow!" I put some sneeze powder on my hand and blew it right at him. Yaller was supposed to repeat the line twice, but he got the full benefit of the powder in his mouth and nose, and it near strangled

There he stood yapping: "Blow-kerchoo-Bugles-kerchoo, kerchoo-Blo-, and then he let out a hole flock of kerchoos. It sounded like the exhaust on a

motorboat. Then a lot of folks sitting near the stage began kerchooing, and as some one

hollered to turn on the lights I blew the rest of the powder in the air, and the hole audience began sneezing, and everyone staggered out of the hall kerchooing and blowing their own bugles and wiping the tears from their eyes with there hankerchiefs.

I sneezed as loud as any so they wouldn't catch on to me, and between sneezes I said it was a darn shame whoever did it.

When we got outside Billy blamed me, and I told him he hadn't ought to kick, it hadn't spoiled his peace.

Anyway, that busted up the entertainment, but no one asked for there money back except old man Traynor, and he's a tightwad, anyway.

Next day at school every one was wondering who busted up the show, and Yaller he said he would be greatly surprised if the one who did it was very far away, and he gave me a dirty look. He couldn't

prove anything, so I should worry. Miss Osgood said that now they had funds enough for the radio the next thing would be to organize School No. 4 Radio Club of Ponckhockie and that we should 'lect officers and everything, and that the lection would take place the next day. She said that the president would have the

(Continued on page seven)

### Trans-Atlantic Liners Make Use of Radio Apparatus for Reproducing Music

Lectures, Entertainment and Radio Programs Are Reproduced at Remote Parts of the Steamer

By A. DINSDALE

Member Radio Society of Great Britain

HE recent introduction and rapid de- | magnify them to an extent approximating velopment of radio broadcasting has brought in its train a development also of electrical apparatus capable of picking up and reproducing elsewhere at | An audio-frequency amplifier is employed high degree of perfection.

The possibility of being able to do this has opened up entirely new fields in acous- detector.

the intensity of the sound at its origin. In



The Grand Salon with microphone in the foreground from which entertainment is broadcast to all parts of the ship

which are only just beginning to be investigated and enlisted in the service of man. One of the possibilities with which most readers are already familiar is what has come to be known as the public address system, which makes use of a microphone for picking up the voice of a public speaker, an amplifier for magnifying the feeble microphone currents to a suitable value, and one or more loud speakers for reproducing the words of the speaker at a distance.

In such a way it is possible for politicians, lecturers, etc., to address a very much larger audience than could possibly be accommodated in any hall, and do so without in any way raising or straining

A new development along these lines has recently been brought out by the British Marconi Company, who have installed apparatus similar to that used in the public address system aboard certain well known British liners for the purpose of reproducing radio music, the music of the ship's orchestra in all the various public rooms, salons, smokerooms, etc., while it is playing away somewhere else in some distant part of the ship.

### Radio Apparatus Used

It should be clearly understood at this juncture that, although this new system makes use of apparatus originally developed for radio broadcasting purposes. radio itself does not come into service as a carrier for the speech currents. Wire connections are used throughout, and the interest centers round the technical details of the various instruments employed, for they can be made to serve equally well the purpose under review or the needs of a regular broadcasting station.

In any equipment designed for repeating vibrations at audio frequency there are three operations involved.

Firstly, there is the picking up of the sound vibrations and their conversion into equivalent electrical impulses, the relative amplitudes and frequencies of which must correspond as exactly as possible to those of the sounds producing them. This function is performed by the instrument known

Secondly, since the electrical impulses produced by the microphone possess only | pieces of which are so designed that an a very minute amplitude, or strength, it is extremely uniform magnetic field is pronecessary, before we can reproduce these | duced in the gap between the core and the electrical vibrations again as sound, to outer iron casing.

order to do this the microphone energy must be magnified several thousand times. will both speech and music to an extremely | for this purpose, as in the case of a broadcast receiver, where it is necessary to magnify the feeble signal output of the

Thirdly, there is the retransformation

of the electrical impulses into the original

sound vibrations which were converted by

the microphone and magnified by the

amplifier. To do this we must arrange to

make the amplified currents set up power-

ful mechanical vibrations in the atmo-

sphere and project them to a distance. The

instrument which does this is called a

The Microphone Used

These three stages are in every way

identical with those carried out in the

course of broadcasting, the difference in

this case being that both the radio trans-

mitter and receiver are eliminated, and we

jump from what in a broadcasting station is called the "speech input amplifier" di-

rect to the sound projector, or loud speak-

er, at the reception end, direct connection

In every one of the various stages described above possibilities exist for a cer-

tain amount of distortion of the electrical

impulses and the corresponding sound

For the last three years the Marconi Com-

pany have been conducting researches with

a view to producing apparatus on a com-

mercial scale which would eliminate any

possibility of distortion. Apparently in-

surmountable obstacles have been over-

come, and the results are reflected in the perfection with which the instruments un-

der consideration perform their various

Two types of microphone are in general

use with this equipment, the Marconi-

Sykes magneto microphone and a type of

carbon microphone which has been devel-

The former type, shown in one of the

accompanying illustrations, is a moving

coil instrument, in which the moving coil

itself acts as the diaphragm. It is aperi-

odic to all audio frequencies, and is able to

deal faithfully with an extraordinarily

wide range of amplitudes without blast-

The microphone consists essentially of

a heavy cylindrical iron container with a

central iron core. These two parts form

a magnetic system and the field winding

is wound on the central core, the pole

ing or other forms of distortion

oped to a high degree.

"sound projector."

being made by wire.

underside of the moving coil. The coil is thus left free to move in sympathy with the sound waves, and, as it is extremely light, it has an almost negligible inertia. The whole instrument is supported on a cushion, or cradle, of soft, spongy rubber, in order to prevent vibrations other than those required disturbing the moving coil.

of an extremely thin annular ring, is

wound with very fine aluminum wire sup-

ported on a paper former. It is suspended

in the magnetic field between the central

core and the outer casing, and the method

of suspension is usually by means of small

wads of cotton wool fixed to the face of

the magnetizing or field coil and to the

The second type of microphone employed is an extremely high-quality instrument of the carbon type, specially developed by the Marconi Company, and can be used in cases which do not warrant the much higher expense of the Marconi-Sykes magneto microphone. It can be fitted either to a stand or with straps for hanging round the neck.

The latter method is of great value to public speakers, who then have complete freedom of movement, inasmuch as it is not necessary for them to remain in one position facing a table or stand micro-

In cases where it is desired to reproduce gramophone music a special magneto gramophone adaptor has been developed which can be attached and used in place of the gramophone sound box, thus producing an electrophonic current directly, which can be amplified and made to oper-

The moving coil, which is in the form | iron armature pivoted at one end, the other being fitted with a special gramophone needle pressing on the record in the usual manner.

The intensity of the electrical vibrations thus produced is approximately the same as that produced by the carbon type of

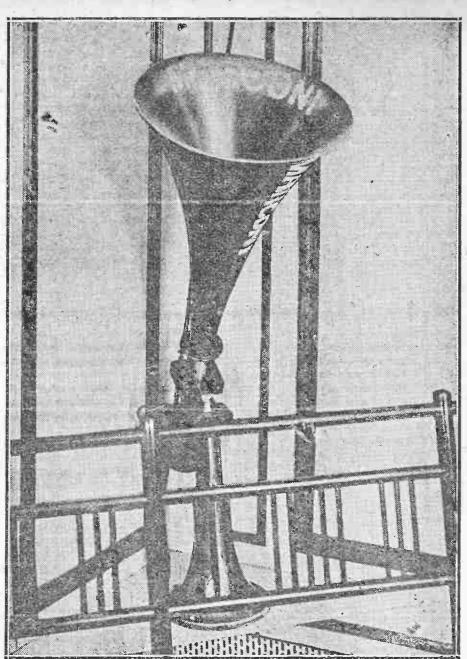
#### The Amplifier System

In order to increase the feeble microphone currents to a value sufficiently high to operate the large sound projectors very considerable amplification is necessary. In the outfit under consideration this duty is carried out by three separate amplifiers, the magneto-microphone amplifier, the microphone control amplifier and one or more sound projector amplifiers, depending on the number of projectors it is desired to operate.

The microphone amplifier is a five-tube resistance-capacity coupled instrument, specially designed for distortionless amplification of the minute currents induced in the magneto microphone to approximately the same strength as the currents delivered by the ordinary carbon microphone.

The input circuits are designed for accepting ultra feeble A. F. currents, and each tube is mounted on a special mechanical filter staging to protect it from unwanted vibrations. All tubes and transformers are inclosed in separate shielding boxes to prevent both reaction and induction between circuits.

In the grid circuit of the second tube an inductance and variable resistance are included for the purpose of emphasizing the high tones, and in the grid circuit of the third tube a variable condenser is ar-



One of the loud speakers used for reproducing entertainment in remote parts of an ocean lines

By the use of this adaptor imperfections due to-faults in the gramophone sound box and horn are eliminated. The instrument consists essentially of a small

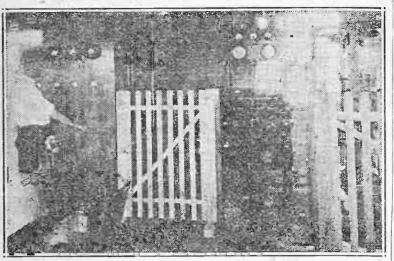
ate either a sound projector or an ordinary | ranged for the purpose of reducing the high tones in relation to the low tones. These two adjustments permit the operator to balance the sounds produced by the

(Continued on page six)

### WGY's Short-Wave Signals Heard 8,850 Miles From Station

Short wave signals transmitted by living in Belfast, Ireland; Liverpool, WGY at Schenectady have been re- London, and Furness, England; La ceived with fair quality and easily Platte, Argentine, and Calgary, Alread volume during the day, 8,850 berta, Canada, have successfully miles from the sending station, and heard the Schenectady developmental have been inaudible 200 miles from transmitter. the transmitter. For several months In studying the behavior of short tests have been conducted by the waves the radio engineers have made radio engineers of the General Elec- reception tests within a 200-mile tric Company on 41.88 meters wave radius of Schenectady. These tests length, using approximately one kilo- have shown that the short-wave sigwatt of power, and from the reports nal was inaudible within that radius received over a great territory it is except on a few occasions, when very apparent that this wave length is es- weak signals were detected. This is pecially suitable for daylight trans- known as the "skip-distance" effect.

The transmitter used for the 41.88 All programs of WGY have been meters broadcasting is located at the transmitted on 41.88 meters, 109 South Schenectady radio developmeters and 1,560 meters, in addition mental laboratory of the General



The 41.88-meter transmitter at the development laboratory of WGY

to the assigned wave length of the | Electric Company, where engineers station, 379.5 meters. The 41.88 are carrying on intensive research in

from Robert L. Simpson, of Pretoria, push pull circuits, but also inter-South Africa, stating that he had mediate amplifiers and crystal quartz picked up the short waves on the in order to steady the frequency. morning of August 2, at 4:50 o'clock, The antenna used is known as the South African time. His log checked vertical doublet. This is simply a with that of the station. His most vertical wire tuned in the middle. interesting statement was: "As it got It is necessary on this type of anlighter here the signal strength in- tenna to have the meter in the midcreased gradually." Pretoria is 7,988 dle with tuning coil on each side.

W. P. Huggins, of Grey Lynn, Auckland, New Zealand, reported reset in the Alps in daylight. Fans will be little or no signals.

meters transmitter has been used all phases of transmission. The

Keep Filament Normal Do not burn the thoriated filament

### An Exhibit of Horn-Type Loud Speakers



Several hundred persons were present at a talk and demonstration given by Dr. A. N. Goldsmith, chief broadcast engineer of the Radio Corporation of America, at the Hotel Pennsylvania last week. The subject of the talk, which was non-technical in nature, was "Radio Acoustics and Reproduction," and to assist him in his talk Dr. Goldsmith displayed a remarkable collection of loud speakers which were in various sixes and shapes and represented different steps in the evolution of the horn-type speaker.

### 12 Stations to Give Talks for Women

To-morrow morning a new type of chain broadcasting will be introduced to radio listeners on a scale more extensive than anything yet tried in commercial broadcasting, when twelve of the principal broadcasting stations of the United States, from the Atlantic to the Pacific Coast, will start the simultaneous broadcasting of the Betty Crocker Home Service Talks. Three times a week, on Mondays, Wednesdays and Fridays, at 11 a. m., Eastern daylight saving time, Betty Crocker will talk to the nation's housewives from the following stations: WEAF, New York: WEEI, Boston; WFI, Philadelphia; WCAE, Pittsburgh; WGR, Buffalo; WEAR, Cleveland; WWJ. Detroit; WHT, Chicago; KSD, St. Louis: WDAF, Kansas City; KFI, Los Angeles, and WCCO, St. Paul-Manneapolis.

This hook-up of these larger broadcasting sttions will be the first in history exclusively for vomen. The talks will deal with preparation of food for the table. nodel menus, party suggestions, proper diet for children and, in addition, three complete cooking schools. The series, with brief interruptions at Christmas and Easter, will continue for twenty-

### Speaks at the Radio Cincinnati Station Erecting Industries Banquet

Last Wednesday evening the sec- Alms's new building for WKRC, the ond annual dinner of the Radio In- Kodel 1,000-watt station at Cincindustries took place at the Hotel Com- nati. The towers will rise approxiequipment is located in a separate modore. Senator C. C. Dill, the outmately 300 feet above street level, WGY recently received a letter frame building and uses not only the standing speaker of the evening, and, as the building on which the pledged himself to continue working station is located is on the brow against any tax that might be im- of a hill overlooking the Ohio River posed on radio receiving sets by the Valley, a drop of more than 1,400 government. He pointed out that feet to the river is almost in front the radio industry was only five years of the building. old and that a tax on radio apparatus The new studios, which have been would greatly hamper the develop- planned by the architect and are bement of the industry.

on the afternoons of July 4 and 5, not turn up the filament rheostat of whom gave interesting and humor- the building, twelve stories above the between 3:15 and 4:30 o'clock. His above normal. This will force too ous talks on the radio industry and street. log checked with the records of WGY. much current through the filament were successful in drawing their Auckland is 8,850 miles from WGY. and release the electrons so fast that share of applause. The toastmaster Stanley McCatchie, a radio experi- the filament will become "run out," or was Paul B. Klugh. Major J. Andrew menter residing in Stuttgart, Ger- free electrons, in a short time. The White was in charge of the program many, received WGY on a receiving filament will burn all right, but there and introduced the artists. The dinner was broadcast by WEAF and twelve other stations.

> Senator Dill pointed out that the United States was the only country that did not have a tax on radio ap paratus and the only country which did not charge a license fee for owning a radio receiver. Some foreign

other compositions could be classed as reproduction for profit.

The dinner music was supplied by Vincent Lopez, who concluded his entertainment with a special arrangement called "Echoes of New York" in honor of Senator Walker. Other entertainers included the Happiness Twins, the Capitol Gang, the Eveready Quartet, the Victor Salon Odchestra, Burr McIntosh and many others.

It you dill a wides will even the left on the active oxides will even the left on the city. Connectors crimped on under the left on the connection on the entire battery. Connectors crimped on under the pressure that your and ruin the entire battery. Connectors crimped on under the pressure that your and ruin the entire battery. Connectors crimped on under the pressure that your oncides will even that the left will be defined by the 99% pure nickel connector —not the rusting, meaningless pressure flow the your heavy pressure. Each battery guarantee the desired.) All contents the left will be defined by the 99% pure nickel connector —not the rusting, meaningless pressure flow the 199% pure nickel connector —not the rusting, meaningless pressure that your nickel connector —not the rusting, meaningless pressure flow the 199% pure nickel connector —not the rusting, meaningless pressure flow the 199% pure nickel connector —not the rusting, meaningless pressure flow the 199% pure nickel connector —not the rusting, meaningless pressure flow the 199% pure nickel connector —not the ventually drop out and ruin the entire battery. Connectors crimped on under the pressure is a close of the visit of the rusting, meaningless pressure flow the 199% pure nickel connector —not the ventually drop out and ruin the entire battery. Connectors crimped on under the ventually drop out and ruin the entire battery. Connector and the pressure flow the 199% pure nickel connector —not the ventuall and eventually drop out and ruin the entire battery. Connector —not the ventuall and eventually drop out and ruin the entire battery. Connector —not the ventuall and eventually

mestic demand for radio equipment, according to consular advices to the Department of Commerce. The interest of the populace in radio is

PHONE TRAFALGAR 5826.

BUY DIRECT—FIVE-TUBE RECEIVERS in solid mahogany cabinets with battery compartment; bokelite panels and parts; patented circuit employing regeneration for extreme distance; 135 to 550 meters; loop or aerial; introductory price \$27.50. evidenced by the increase in the number of registered receiving sets from 50,000 on January 1, 1925, To 129,000 in March, 1925. Interest seems to be lagging at the present time, however and carried and the present seems to be largering at the present seems to be seems to be seems to seem the present seems to seems to seem the present se seems to be lagging at the present See it demonstrated. Agents wanted D. S. WYLIE CO., 1 East 42d St. time, however, and as a result sales have dropped off to approximately one-third of those made during the

D. S. WYLIE CO., 1 East 42d St.

BUILD your own "B" Battery. Nickle and iron elements and all supplies.

Roberts, 1122 Myrtle ave., Brooklyn. nast winter months. It is believed that this condition is largely sea-sonal and that during the coming fall and winter interest in radio and the demand for radio equipment will again be in evidence.

A small watch case voltmeter is a valuable accessory to any radio set.

WEN to build radio sets in spare time.

Leon Lambert, Wichita, Kansas,

### Canadian Railway Minister Indorses Radio Publicity

of Railways for Canada, in a recent speech paid a high tribute to radio as utilized by the Canadian National licity purposes. It will be rememwhich includes eight high-power stations. During his speech Mr. Graham said:

"When Sir Henry Thornton took charge of the system the Canadian National was practically an unknown quantity on this continent, and people traveling east and west from the United States and elsewhere who might well patronize our railway knew nothing of it. "To-day, however, the entire conti-

nent of America knows there is a Canadian National Railway, Even the name Canada itself has been carried to the uttermost parts of the continent, and we are becoming better known every day through the use of the radio. All companies spend millions of dollars advertising, and this modern method is being used by many of the advertisers.

"I have no hesitation in saying that for the money expended the Canadian National Railway has received three times the publicity it Senator C. C. Dill could for the same money through any other means."

### Plant With 1,000W. of Power

Towers rising 125 feet high are being placed on top of the Hotel

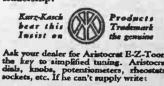
ing built directly in the hotel, will The entertainment included a long include an orchestration studio, sold list of radio artists all of whom are studio, lounge and offices for the well known to the radio fan. The studio director and chief engineer. other speakers were E. J. Cattell, of The operating and battery rooms ception of WGY's 41.88 meter signal tubes at too great a brilliancy; do Philadelphia, and Will Rogers, both will be located on the top floor of

Talk on Oceanography, WJZ John TeeVan, assistant to William Beebe, director of the Arcturus oceanographic expedition, will give the second talk in the series under Hon. George P. Graham, Minister the auspices of the New York Zoological Society from Station WJZ at 9 o'clock Tuesday evening. Mr. TeeVan is considered one of the world's Railways for advertising and pub- leading authorities on the subject of bered that the Canadian National is ber of eight similar ventures in Britthe only railway in the world op- ish Guiana, South America, the West Indies, Venezuela and the Galapagos



4-in. Dial with 25%-in. taper Knol Markings 0-100 0-200

To have been "first" shows antiquity To have become "first" proves merit Over two hundred Radio Manu The beauty of design—the pains taking workmanship—the exclusive patented split bushing all have combined to earn for Kurz-Kasch products the enviable position of leadership.



Dayton, Ohio

### Radio Exchange

Rate, 40 cents a line; minimum, 3 lines. Agate caps and white space only display permitted. Ads. accepted until 12 o'clock noon Friday.

PHONE PENNSYLVANIA 4000

#### Parts and Equipment

countries do not allow the use of radio apparatus. This is the reason why the American people have progressed so far in the radio industry and why ower 90 per cent of the radio broadcasting of the world is done in this country.

On the question of royalties Senator Dill said that he did not believe that the broadcasting of songs and other compositions could be classed as reproduction for profit.

Parts and Equipment

EVERY KNOCK A BOOST
FACTORY MADE CHARGER FREE
WITH EVERY COMPLETE BATTERY.
There are three types of "B' Batteries, the dry cell, the lead storage battery and the alkaline battery using Edison element. The Edison element "B' battery users, thereby surpassing all others. Can be short-circuited, over-charged or discharged without its being damaged in the least. The See-Jay Battery is constructed from genuine alkaline elements and connected with a non-corrosive connector. No holes to drill or wires to loosen. If you drill a hole in the element the active oxides will eventually drop out and ruin the entire bat-

want Home-Built in Austria

Austrian radio manufacturers, protected in their home market by cn import license, were, during the last winter, hardly able to supply the domestic demand for radio equipment,

winter, hardly able to supply the domestic demand for radio equipment,

For Sale

WEEK'S BARGAINS Wanted

Parts and Equipment

RISKY TO PAY LESS NEEDLESS TO PAY MORE

THREE YEARS SUCCESS-The "Haw

LOOK UP DOWN

FOR RADIO
SUPER-HETERODYNE SPECIALIST.
BUILDING, REPAIRS, ETC.
NO CHARGE FOR CONSULTATION.
CHAS. W. DOWN,
711 EIGHTH AV. (45th St.) PENN. 7779

or any 3, 4 or 5-tube set for \$5, AUTHORIZED AMBASSADOR SERVICE For real selectivity we build the fa-mous 4-tube Ambassador, using all gen-

ERLA SERVICE STATION
Authorized by Electrical Research Lab.
A limited number of factory built
Eria sets at special prices.
REPAIRING, REMODELING, REWIRING
all circuits. Also carry Eria parts.
APEX RADIO SERVICE

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of the constant current amplifier, but it has taken considerable time and space to lead up to the point where this particular form of amplification would be readily understood. All the ideas involved have already been explained rather fully in the preceding articles and can now be put together intelligently.

In the August 30 article a diagram was shown of the common form of resistance coupling, both one and two stage amplifiers, added to one stage of transformer coupling. The single stage resistance amplifier connected to one stage of transformer amplification is shown first in the figure published to-day. Between points P and B is inserted a resistance. It makes no particular difference what that resistance is made of, so long as it is nonconductive and is permanent. As a resistance of a certain value, it always is the same in effect. Remembering that, we can see that this resistance in its ordinary tubular form can be removed and in its place we can substitute the internal resistance of a lighted vacuum tube. That is shown in the second diagram to-day.

For this tube resistance, the filament must be heated, of course, and a separate A battery must be used for this purpose. We must consider the tube with its own A battery as the substitute for the tubular resistance, just as it is shown in the figure.

#### Proper Value of Resistance

There has been much discussion over the proper value of the resistance to be used with a resistance coupling. There has been much talk of matching the internal resistance of the tube. Obviously, the internal resistance of the tube varies continually with the grid voltage applied to the tube. You cannot match the internal resistance of any tube with an external resistance and there is no particular reason why you should. The idea of matching the tube is stressed in the wrong place. What actually is the case, is that the power output of the tube is maximum when the external resistance equals the internal resistance. That is a matter of tube power efficiency. It has nothing particular to do with the results you hear on the speaker.

On the other hand each tube has a certain amplification constant, which is a sort of theoretical figure. It is a basis to compare amplification. It is not the amplification you will obtain from a stage of audio using that tube. As a matter of fact, if the external resistance equals the tube resistance the amplification of the combination will be one-half the theoretical figure. The higher the external resistance | the other is equally negative. Then when the tube resistance with the external re- of one tube is increased, the resistance of sistance fixed, the greater the proportion of the theoretical amplification you will

### External Resistance

Usually the external fixed resistance used varies from 80,000 ohms in some amplifiers up to 150,000 ohms in other amplifiers. It is not a critical value and the resistances commercially furnished are not generally exact anyway. Anywhere in or about the figures named give fair results for this type of amplification.

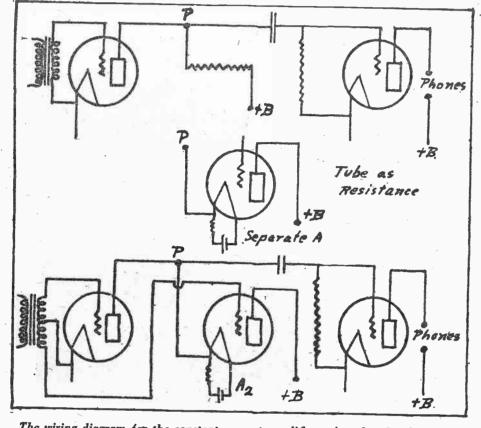
If the tube is used as a resistance coupling, as shown in the second diagram, the value of its internal resistance will be fixed, if the filament stays at constant temperature and the grid is not connected to anything. The lower the filament is turned the greater the resistance, and the higher the filament is turned, the less the resistance, within limts. This adjustment from dull electron emission to high electron emission gives a variation in the coupling resistance. Also, as pointed out in the article discussing this type of amplifier two weeks ago, a great change in the internal resistance of the tube may be made by connecting the grid to a separate battery, corresponding to a C battery. The positive end of the B battery can be connected to negative filament and the grid connected to the center arm of a potentiometer across the B battery. The same effect can be obtained by connecting the grid to the center arm of a potentiometer across the separate A battery shown. The difference is that with | the air, the C battery you can merely many, the

T WAS in the issue of August 30 that | internal resistance, but with the potenti- | tube and the resistance of the middle tube | resistance values are used, although there can both increase and decrease the internal resistance of the tube. When you | fixed resistance with varying plate current, make the grid negative the internal re- thus giving a variable voltage drop across sistance is greater. When you make the the coupling resistance, we now have fixed grid positive the internal resistance is

> the preceding transformer so that it condenser is large enough, and the resultwill vary with the signal. This arrange- ing amplification is good. We can thus ment is shown in the third and last dia- have audio amplification in a radio set or gram of the figure. Here the middle tube | for any other purpose, using only tubes is purely a resistance which couples the and batteries, no coils or transformers first tube to the third tube. It is the being used. same diagram as at the top of the figure except that the coupling resistance now is | in any form of coupling using a condenser

rent will be of constant value. Instead of current and varying resistance, giving a varying drop across the coupling tube. Now, in place of changing the grid | This varying voltage drop is impressed on voltage by hand, you can connect it up to the grid of the last tube, if the blocking

As has frequently been stated before, variable, the variation being caused by as a blocking condenser, with a compara-



The wiring diagram for the constant current amplifier referred to by the author the grid voltage variation due to the | tively small coupling resistance, the con-

amplified signal.

### **Grid Voltages**

With the tubes as here shown, and the first tube having exactly the same characteristics as the middle tube, the secondary of the transformer being properly split (and for this a push pull transformer can be used), the grid voltages of the two tubes will be equal at all times, but opposite in phase. As one is positive with the tube resistance fixed, or the lower the resistance between plate and filament

denser value must be as great as convenient, preferably as high as 2 mfd. Otherwise this blocking condenser causes even greater distortion in the signal voltage impressed on the grid than would be caused by methods giving very much greater amplification. A small condenser destroys whatever merit there is to resistance coupling.

It would seem that two of the new results, and either one of the new tubes the other tube is decreased by exactly the | can be used. In fact the new tubes may or one of the old tubes in the last stage same amount. The total resistance, which give good results in any stage of the reincludes the internal resistance of the first | sistance coupler if the proper coupling

### Bloops and Static

= By STEPHEN L. COLES ===

The question as to whether a woman | facturer, returned recently from a huntcan keep a deep secret was recently raised at WEAF, when a young lady wrote in asking them to divulge the name of "that wonderful man-the Man in the Silver Mask. I personally insist on it being Graham McNamee or Phillips Carlin (The Twin), and I will keep it as a great secret if you will only tell me."

In reply they assured her that her guess was quite erroneous, as McNamee is a barytone and Carlin, the announcer of the Silvertown Orchestra, is a "ukulele bass," and that, although they "knew she would never tell another soul, the tenor with the silver mask was somewhat like Topsy in 'Uncle Tom's Cabin.' He never had a name."

Those who have the means, the time and the sporting instinct, go to the jungles of white man living in Africa finds zest in hunting for American radio stations on

A. M. Creighton, a Lyon, Mass., manu-

ing trip into British East Africa, reports finding a radio receiving set near a tiny native village. His white hunter, when asked if he ever heard an American station, replied: "We had some place in the United States called Skinny-de-de."

After considerable questioning, Mr. Creighton was convinced that the man heard WGY, the General Electric Company station at Schenectady, N. Y.

Kansas claims the first radio commencement in history. The Kansas Agricultural College sent invitations this year to 1,800 "aggies of the air," students enrolled in courses conducted by radio, to attend this notable event in person.

John Arnold, safety director of the Cincinnati Automobile Club, is broad-Africa in their quest for big game, but the casting a series of safety talks over WKRC, Cincinnati, every Tuesday night as a contribution to the national safety campaign carried on by the American Automobile Association.

ometer across the separate A battery you | together, will be constant. The plate cur- | would seem to be no call for them and they are not as economical as the UV tubes already widely used. The new tubes are specifically for the last stage, particularly for very high B voltages, and particularly designed for the operation of particular types of loud speakers. They are not generally adaptable as general purpose tubes. We recommend that you stick to the well known types of tubes for your experimenting with audio circuits and thus eliminate one possible source of trouble.

#### Two Constant Questions

Before closing this discussion of audio amplification with which we have now been busy for four weeks without digressing, we might bring up again two constant questions. First, the question of ratio, and second, the question of transformer curves.

When the question of ratio raged like forest fire in the news columns and advertising columns of radio magazines some two or three years ago it largely centered about a 10 to 1 ratio, which then was common in transformers. To-day few transformers have a much greater ratio than 5 to 1, and the transformers themselves are far better in performance than was looked for then. The 10 to 1 ratio transformers gave a corresponding amplification, but only on a narrow band of frequencies, so far as could be seen by static tests, with a resulting blast on those notes. A lower ratio usually had a hump in the curve at some other point, and the result of placing a high ratio and a low ratio transformer together was to more or less smooth out the curve resulting from the two stages. When nearly all manufacturers came down to 3, 4, 5 and 6 to 1, transformers generally gave pretty flat curves over a wide band of frequencies, and even two of the same identical make could be used together without blasting or blaring. The question of ratio settled itself, and now it would make no particular difference if all transformers were put out without ratio marks. They mean little and have become of less importance. The construction of the transformer is now the important thing. We want quality more than we want volume in most cases.

### Transformer Curves

It was and is the fashion to show a straight line as the curve of a transformer. Just how much this means has never been figured out. This is a static characteristic; that is, a curve taken point tubes used for the first and second tubes | by point on a testing apparatus, and not a in this system would give satisfactory test in actual service. Whether this means anything we do not know, but it has been may behave differently than it does under test, and the reason for this belief is that some transformers with terrible curves have given pretty good results from the audibility standpoint. An explanation of this is that the curves were taken with plenty of time for the adjustment of conditions within the transformer as the frequency is changed while in use, there is a shift from one frequency and back to another instantaneously. There is very little sustained frequency, but constant change from one frequency to another. The coils and core are subjected to instantaneous effects rather than to prolonged effects. The curves show the action under prolonged effects, but the ear hears the results of instantaneous effects.

> We have shown seven methods of audio amplification, all of them requiring a first stage of transformer coupling to give maximum results. There is plenty of room for study and experimentation in these circuits and, in many ways, it is the easiest way to become familiar with wiring, tube action and radio parts. You have the advantage that you always have a signal to start with and you cannot lose the signal in the amplifier. You will always get some sort of results and your ingenuity will be exercised in making these results better. You can become familiar with methods of finding trouble and remedying it and thus become prepared for experimental work with radio frequency. where you have nothing to start with and very often after hours of work, your position has not been materially improved and you conclude that all the broadcasting stations in the world must have signed off.

### During the Last Four Years Orchestra, the New York Symphony Orchestra, the Oratorio Society of The Majority of Radio Fans When Broadcasting others proved from the outset to

Was First Initiated Were Amateurs; Out-of-Studio Events Were Part of Development

By J. A. Holman

Manager of Broadcasting, American Telephone and Telegraph Company | growing importance. Permanent in-

ERHAPS you are one of the radio listeners who heard the recent splendid hotel music at regular interfourth anniversary program broadcast by station WEAF. You vals, and similar installations have may even have been one of the many who wrote congratulatory been made to provide other forms of letters to the station on that occasion. The great difference in the radio entertainment. program of four years ago and to-day and the marked trend in the development of radio programs must have occurred to scores of the of radio programs from simple studio more thoughtful radio fans. It will be interesting to follow program tendencies by tracing briefly the history of WEAF. Although the birthday recently cel- &-

example, in 1915 speech was trans- structure. mitted successfully from Arlington, Va., across the continent to San Francisco, over the Pacific to the Haby engineers of the company in co-op-

With the advent of radio broadthe purpose of studying the engineering economic problems confronting this new art.

immediately. The demand was over- educational acid test. The result was While the many letters of the radio whelming, not only from radio listen- immediate and astounding. The uni- audience were being carefully ers but from business organizations versity was encouraged to further analyzed to study program tendencies, which sought to utilize the new art efforts. Since that time, two years and while the station managers were by installing their own broadcasting ago, there has been a continuous conducting independent experiments equipment. In New York alone more series of lectures by university regarding program values, business than 100 inquiries were received re- authorities, discussing such subjects organizations were not slow to step garding the purchase of radio trans- as history, psychology, religion, into the picture and to bring a mitters. This would have meant 100 politics, economics and other major valuable contribution to the art's broadcasting stations transmitting all subjects. Education and radio were development. kinds of programs simultaneously, insolubly linked. with the attendant economic and engineering inefficiencies and a positive disservice to the radio audience. The

were the amateurs, the old dyed-in- audience desired. Great care has is keenly realized by our officials. A still with us to-day, are greatly out- tions from the earliest times. Abso- evolved. Time is not being filled in numbered by listeners preferring pro- lute impartiality must be shown, as a haphazard way with whatever magram quality to experimentation. This the radio fan has taken much in- terial may be available at any particaudience grew rapidly, for the fast terest in politics and will be the first ular time and in whatever order may cination of radio telephony seized the to notice and to decry any leaning best fit the conditions of the evening. public imagination with an over- toward one party or another. Equal Having laid out a definite plan for whelming force. At first, mechanical opportunity was offered last year to presenting only the very best of propianos sufficed. To cater to the grow- broadcasting of their national con- more and more tend to follow this vantage of the new publicity medium country. requested placement on the programs. With the fondness of the American vocal or instrumental, opueratic,

might secure other engagements. phone circuits through the station in those pioneering days? It was the was the first important broadcasting natural development from the simple from a remote point, and words fail studio programs to out-of-studio utterly to describe the thrill which events. Program managers were the Eastern football fan experienced aided then as now by the radio fans' when he heard that Princeton student letters. While the mail was fairly band playing in Chicago and followed heavy, it contained a smaller propor- one of the most exciting football from his vacation in Havana, Cuba, tion of constructive criticism, the ma- games in years, play by play, simul- the programs by the "Plunketeers" jority of letters being expressions of taneously with the actual happening, of the Mark Strand Theater have been dium and its quality programs. Our was the radio audience to respond WOO, Philadelphia. To-morrow the station impresarios carried on ex- to this type of program that the entertainment will start at 7:15 p. m., tensive experiments and increased tendency to present sporting events continuing to 8:30 p. m., Eastern the number of program hours from on a larger scale each year has been daylight saving time, and will consist fourteen a week to the present aver- marked. Now the radio audience fol- of the music from the stage, includage of fifty-two. WEAF's personnel lows every important sporting event, ing the overture by the orchestra, was doubled and then tripled. Every whether on the Atlantic or on the and a special homecoming celebration step was taken as a result of care- sun-kissed fields of the Western by the individual artists from the fully arranged experimentation. As- | Coast, be it football, baseball, horse Strand studio.

ebrated was WEAF's fourth, it was sisted by the more thoughtful letter more than four years ago that the writers the station branched out into American Telephone and Telegraph many new fields. Musical programs, Company started experimental work while forming the backbone, could not quality long distance circuits. While in radio telephony. Being pioneers fill out the structure. Education, rein the art of voice communication, ligion, arts and sciences, politics, long distance telephone lines across our engineers were actually engaged sporting events, governmental and the country, much engineering work in the advancement of the art since public proceedings, each was studied had to be done to fit all of these lines the birth of the vacuum tubes. For to determine its place in the program for radio purposes. These circuits

waiian Islands and at the same time radio as an example. The important made for their use for radio broadin the opposite direction across the religious bodies were consulted. From casting, telephone and telegraph Atlantic to Paris. This was done the first we felt that broadcasting facilities had to be removed from activities along religious lines should the circuit and there had to be subcasting WEAF was established as the bodies were consulted and invited to quired for the broadcasting circuit,

Browning, it was felt that radio and other programs to the radio The first question was answered broadcasting was being given the audiences eagerly awaiting them.

### Political Organizations

broadcasting was looked upon as a from pre-empting a larger share of best can be considered worthy of suci

were disconnected presentations of not long before WEAF made experione soloist after another. While in ments along these lines. The first news, household information. The the very earliest days of the art it great effort was on the occasion of program structure will, in fact, be a was possible to secure a few of the the famous Princeton-Chicago footonly because it appealed to them as a Chicago, in the fall of 1922 and retakingly keeping abreast of this deoutstanding artists they performed ball game, played in Stagg Field, endeavor. What were the program tendencies to the metropolitan audience. This many steps ahead of the public in those pioneering days? It was the was the first important broadcasting anticipating the public taste and in enthusiastic surprise at the new me- a thousand miles away. So quick resumed from WEAF, New York, and

Tendencies of Radio Programs | racing, boxing, airplaning or racing by college crews or power boats. racing, boxing, airplaning or races

New York, the Schola Cantorum and be popular, also an occasional Broadway show, confined mainly to musical comedy. These programs from sources outside the studio proved to be so acceptable that there never has been any question of their continuance and stallations were made to convey

The tendencies in the development

bring important engineering and economic problems with them. To link up stations in distant cities meant the utilization of special high were designed for telephone subscribers' use and in addition to talking circuits were utilized for tele-Take the question of religion in graph service. When demand was be confined to such times as would not stituted equipment for the transmisconflict with fegular church services sion of radio programs. Special en-The Catholic, Protestant and Jewish gineering and balancing were reparticipate in the big radio experi- as the radio signals would be amplified to such an extent as to produce The educational problem was what in telephone parlance is called handled in conjunction with an out- "Morse chatter" and "crosstalk." It Was there a demand for radio standing educational body in the city, was found that a limited amount of broadcasting? If so, what did the Columbia University. That there was facilities could be so arranged that public want? How was the demand a place in radio programs for serious the circuits would be available for to be met from the economic point lectures authoritatively and interest- broadcasting purposes at a time when of view? Finally, how could facilities ingly presented, was expected, but no the long distance telephone traffic be set up to meet the demand on one anticipated the public response. was at a minimum. The result was a the part of those who had legitimate When the home study department of ready means for connecting a netuse for the new medium? These four Columbia University selected as its work of stations in various parts of questions were and still are the outstanding ones presenting themselves lectures on the poetry of Robert present important sporting events

In the earlier days the radio audience was small. It is now nationwide. It staggers the imagination to As may be expected, national realize that the areas covered by the raison d'etre for WEAF will now be political organizations eagerly seized present fourteen network stations evident. It was to determine how upon radio's opportunities. The new contain almost two-thirds of all the genuine was the demand by these medium could counteract the evils of people in the United States and that organizations for broadcasting facil- the voter's indifference and reach the the potential radio audience is simities and to carry on the general citizen and his family within the conexperimental work that the station fines of his home. The real problem listeners in the country, or an estifor the broadcasters was not to obtain mated total of 12,500,000. The poten-Amateurs Were First Radio Fans | the co-operation of political bodies, tial audiences listening to network At the time this station was started but rather to keep political activities programs will grow. Only the very novelty. The majority of radio fans program time than the radio wide distribution. Our responsibility the-wool fans who, while they are been exercised in political presenta- definite program structure is being music by phonographs and player the major political parties for the gram material, our impresarios will ing audience, aspiring vocalists and ventions, with results that are definite order so that the radio audiinstrumentalists desiring to take ad- known to every radio fan in the ence will receive a prearranged and balanced program of music, whether For the first year or two programs public for sporting events, it was semi-standard or popular, a program cross-section of the best in human

velopment. It is our spirit to keep an endeavor to serve.

### "Plunketeers" Return With

A Homecoming Celebration With the return of Joseph Plunkett



### TIMMONS Radio Products



like this will never again be presented as long as you live. This is not just advertising talk, but a statement of Fact Which cannot Be Contested, Disputed or Doubted. Please note—We advertised 1,400 of these sets in The Herald Tribune the past few weeks. Hundreds bought from all over the country They're going fast—very fast. First come, first served.

Please consider—The Federal is a Ten Million Dollar Corporation (\$10,000,000) and the Federal is one of the best sets on the market.

THE NATIONALLY ADVERTISED TYPE 110 RECEIVER, 3 TUBES LIST PRICE \$105





Including in purchase of set we will give ABSOLUTELY FREE a \$7 Fedan 80c Phone Plug

Type 110 Radio Receiver sold all over and listing at \$105— Consists of one stage Radio detector and one stage of audio frequency amplification with a control which allows

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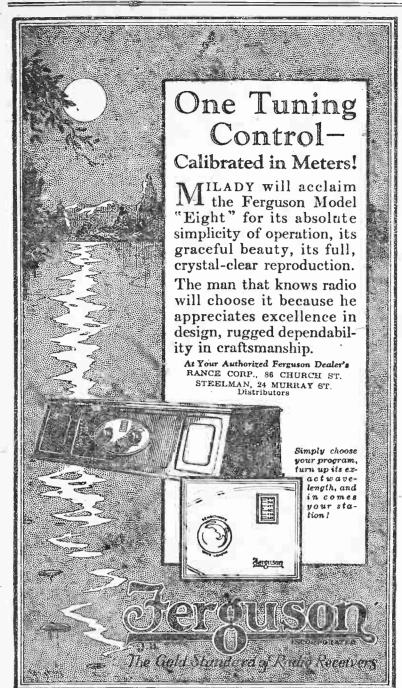
In Original Sealed Factor Cartons

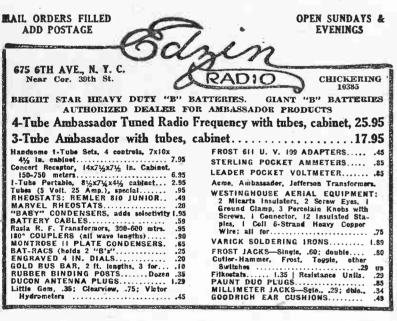


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### Army Band to Start Series of Concerts

The United States Marine Band closed its summer broadcasting season through Station WJZ of New York and WRC of Washington on Thursday night, September 17. In the future the Thursday night concert of band music will be furnished by the United States Army Band, playing in Washington and brought to New York by land wire and broadcast by WJZ at 8:30. The first of this new series of concerts will be given on Thursday night, September 24, and will continue indefinitely. The major portion of the band music during the last summer has been furnished by either the Marine or Navy band, and now with the advent of the army organization the listening audience will have the opportunity to hear the music characteristic of the third arm of

### Radio Is More Intimate Than

friendlier and more personal appre- plication to service. sibly be engendered by work behind tions serve as milestones to disclose should have complete chaos in the ciation and affection than can pos-

from my radio fans," says Miss Lillian Gordone, the popular "Jane" of and lastly to serve the listening pub-Station WGCP, "and these are often lic. The keystone of the industry is progress, and this manner of regula-Station WGCP, "and these are often to maintain their interest by service. That is the motive of the broadcaster solution of problems is unique in our am sure would gratify even our most who gives us better programs and relations of government and industry. popular stage favorites. My correbetter quality of transmission and is spondence ranges from sincere little the object of the manufacturers of notes of gratitude from aged folk, who in the seclusion of their own the Department of Commerce which all other countries and I feel it has chance song which has evoked happy memories for them, to flagrant mash notes from members of the younger

"Very often, too, girls drop in at the studio to see me after having interested, not only as an industry, whole development of relations beheard my voice over the radio," con- but as a public service. There is no tween the industry and the public, tinued Miss Gordone. "Recently a industry so dependent upon public though we still have plenty of unyoung lady walked in just as we good will and interest. was delighted beyond words."

nust be provided. Miss Gordone re- come a national event. called one particular evening at the station when of necessity she was

of rivalry between performing artists some system of tax upon listeners. and their readiness to assist each other without additional recognition or announcement, a situation rarely found on the stage where various

and evening. The artists to broad- sorship.

## Sec. Hoover Opened Radio Show From Washington With Speech

There Are 600 Broadcasting Stations With More Than 6,000,000 Receivers in the U.S., and There Must Be Regulation

Following is the text of the address delivered by Secretary Hoover at Washington, D. C., on the occasion of the opening of the fourth annual National Radio Exposition at the Grand Central Palace, New York, and broadcast through stations WRC, WJZ and WGY Saturday night, September 12.

HE opening of the fourth annual National Radio Exposition is one more reminder of the youthfulness of this great system of communication. Radio has already become so imbedded in American life that we forget that the development of this great scientific discovery is but five years old. Five years ago we had scarcely a single broadcasting station. To-day we have more than 600 stations and probably 6,000,000 homes with receiving sets. Five years ago the total expenditure in the industry was less than a million dollars for the year. It will probably exceed \$400,000,000 this year.

of witnessing the progress from birth finally settled our policies for all Legitimate Stage economic life of the peoples of the the broadcasters and even the staff world. You who attended the first of the Department of Commerce de-There are any number of people National Radio Exposition four years serves some credit. who think that beyond its financial ago and who have the privilege of In the course of another month I being present again to-night can see am summoning the Fourth Annual ompensations, radio broadcasting is marvelous advances in the art. No Radio Conference in Washington in thankless job, and that the radio other invention in all the time in- which all elements-the listeners, artist does not receive any of the vaded the home so rapidly and in- the manufacturers, the broadcasters, plaudits and personal admiration of his fellow artists on the stage, whereas, if the truth were known. whereas, if the truth were known, year. Every year brings additional discuss the mutual problems of this it would seem that the radio broad- scientific discovery and there follows industry. caster is the recipient of an even upon it new inventions and new ap-

The annual national radio exhibi- regulation. Without regulation we these advances.

receiving sets. It is the object of In radio we are far in advance of has the very difficult task of keeping been in large measure due to the cothe traffic lanes clear so that the operation worked out in these confervoice over the radio may reach the ences. And with the fine co-operalistener. It is, therefore, the tion which we have developed we listener in whom we are primarily have done something new in the

were commencing our program for But whether the listener pays The number of radio channels is the afternoon. She had a rather directly or indirectly or not at all, it limited. They are already so overpleasing voice, and so I asked to is the listener in the American home crowded that there is little room for have her put on with me in a duet. who is the foundation and furnishes the newcomers. They jostle each The song was a success and the girl the support for the whole industry, other a good deal. More legislation "One of the sternest tests of the the whole radio structure will fall being frequently suggested and we worth of a permanent staff artist at as quickly as it has grown. I take must sooner or later determine the radio broadcasting station is his it that it is the realization of that major issue whether we will conor her versatility and adaptability," fact and the wish to demonstrate the tinue to allow every new broadcastsays Miss Gordone. Innumerable efficiency of the service, both present ing station access to radio paths or times artists who are scheduled to and to come, that lies behind the an- whether every applicant entering play or sing default at the very last nual exposition in which you are now must first show a legitimate and a noment and other entertainment participating and which has now be- valuable purpose to the listener be-

### Listeners Pay for Entertainment

called upon to sing as "Jane," and as Now it is often said that the lis- in the amount of power necessary to 6 WARREN STREET Madame Gordone play as "Mabel tener in the United States receives give real service to listoners even 85 BARCLAY STREET West," accompany another artist in an extraordinary service without pay- against opposition of static and sumhis performance, and improvise soft ing for it. This is not entirely true, mer conditions and without adding music to Mr. Elliot's reading of some for he pays indirectly for much of it. still further to congestion and inpoems from a volume by Robert But in the fashion in which we have terference. Service. This program incidentally developed the organization of radio was acknowledged the best of that in the United States the listener is day given by any station, and this free from any direct charge for pronews when it was received at the grams and in this we differ from the toy to a communication system now studio caused a great deal of hilarity methods of foreign countries who well nigh universal. It is better and studio caused a great deal of hilarity among the principals of the almost entirely impromptu performance.

"There is a delightful and gratimuch anxiety was expressed that we much anxiety was expressed that we believe it would be almost possible believe it would be almost possible believe it would be almost possible fying lack of antagonism between radio players," Miss Gordone remarked, "in regard to the absence marked, "in regard to the absence marked," in regard to the absence marked, "in regard to the absence marked," in regard to the absence marked, "in regard to the absence marked," in regard to the absence marked, "in regard to the absence marked," in regard to the absence marked, "in regard to the absence marked," in regard to the absence marked, "in regard to the absence marked," in regard to the absence marked, "in regard to the absence marked," in regard to the absence marked, "in regard to the absence marked," in regard to the absence marked, "i

found on the stage where various actors playing on the same bill must compete for the favor of the audience in front of the footlights."

stant annoyance of any attempt to assess the cost of broadcasting upon each receiving set and I have believed that the industry would develop far more rapidly in this manner than if we pursued the European plan.

Brooklyn Show to Broadcast But beyond this, support by taxa- ing contentment into the home. Arrangements have been completed tion means a limited number of govat the Brooklyn Radio Exposition ernment controlled broadcasting sta. national exchange of ideas by direct for the installation of a spections, and, therefore, much less vari- speech. And it will bring us better cial broadcasting studio on the cty of program, much less competitive understanding of mutual world probfloor of the armory, where programs endeavor to please the listener, and, lems. Only over-optimistic prophets will be broadcast each afternoon above all, constant danger of cen- would attempt to predict radio ad-

cast from the exposition will be I am to-day confident in the an- that the radio industry is only in its chosen by the radio audience through nouncement that our policy that there youth, that it will continue to grow a voting contest conducted in the shall be on the air every broadcasting with increasing strength. If it will newspapers. The show is scheduled station for which there is an avail- succeed it must continue as in the to take place during the week of Oc- able channel and that the cost shall past to devote itself to actual public to take place during the week of Octubro constitutions has proved far and cated.

service to which it is already dedicated.

I do not believe any other generation in history has had the privilege away the most successful and has to adolescence of a discovery so pro- time. It is a great accomplishment foundly affecting the social and and one for which the manufacturers,

everybody agrees that there must be air, and as every word by radio is an interstate performance we cannot avoid Feederal regulation. Attempts Every radio activity exists finally to regulate rigidly by law the co-operation of the industry and

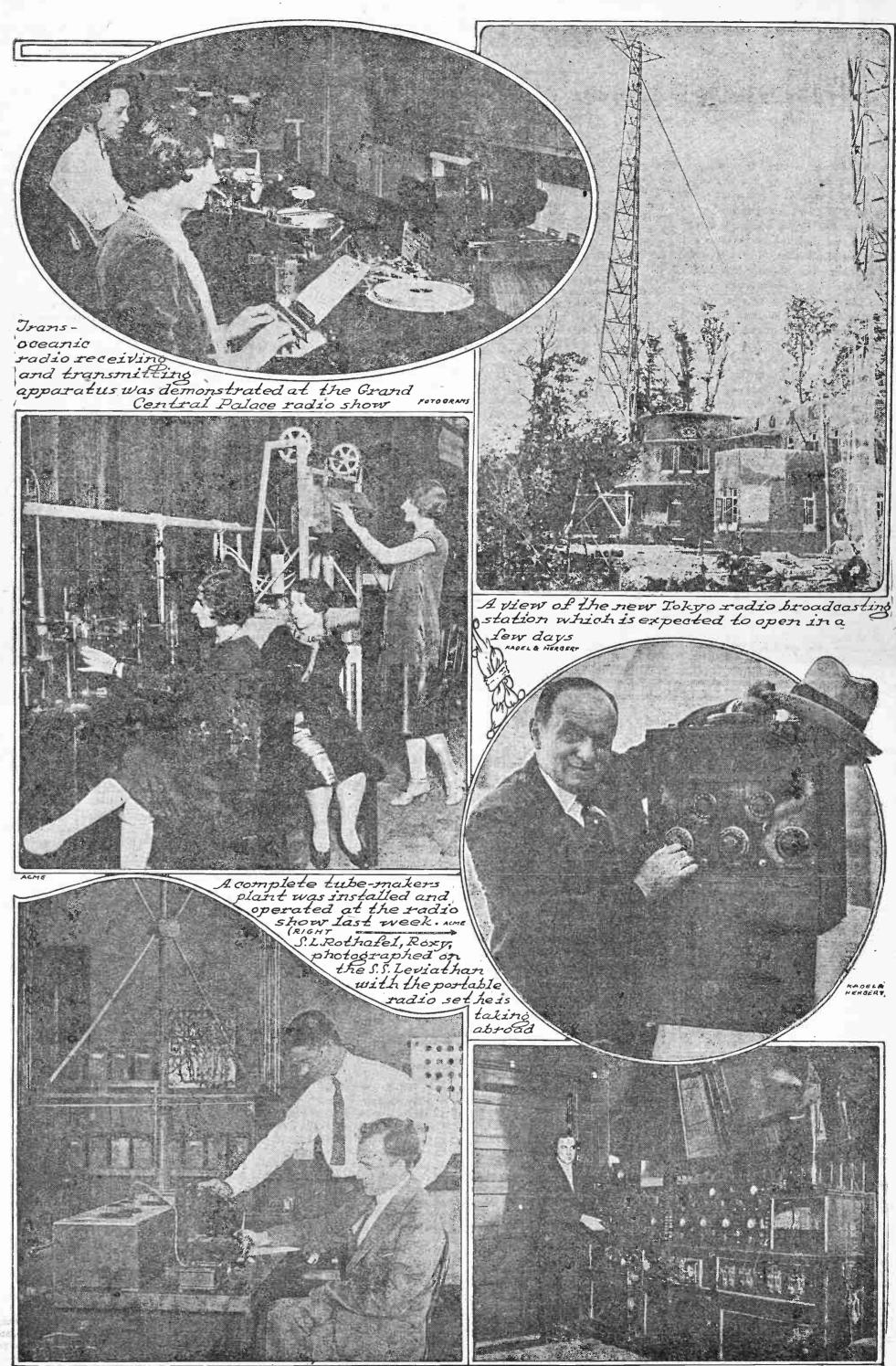
for if he relaxes or his interest fails, for the solution of our difficulties is the overcrowded airlanes.

We have a great unsolved problem

We have all watched this industry music and entertainment. It is bring-

We are at the threshold of intervance. One thing we are sure of,

### Up-to-the-Minute News of Radio in Pictures



Dr.J.H.Dellinger, Chief of the Radio Laboratory of the US. Bureau of Standards checking up the outensity of broadcasting stations.

This special super-heterodyne receiver employs twenty-three vacuum hubes and cost more than \$ 3,000. - MOEL & HORAN

### Now Is the Time to Overhaul the Set in Preparation for Winter

For the Mechanically Inclined Fan the Process Is Simple and the Results Are Worth While

By R. C. HITCHICOCK

RADIO set should be carefully looked into at least once a year. If you owned a car you would certainly have it looked at by a mechanic as often as that if you wanted best results, and your radio set deserves a similar amount of attention. This is a good time to go over your set-before the long, clear winter nights, when reception is ideal. Take "time out" some night when the static is especially bad, and do your set a few good turns. You may find worn parts that need replacing; loose wires on your rheostats, and even corroded connections which permit the current to flow only with difficulty. To find such incipient troubles is to find the "stitch in time. that saves nine." Sometimes even when you think your set is doing all that can be expected of it you will be surprised at the immeasurably better results that come from aa comprehensive cleaning up.

While the complete overhauling of a set is not to be recommended to every one, it is really quite a simple operation, and if one is at all mechanically inclined the process is quite simple and the results will be infinitely worth while. Many of the hints will be applicable to factorybuilt sets, but this article is written especially for those who expect to completely dismantle their radio sets. If you yourself made the set that you are about to overhaul, it will be much simpler and cleaned them. If the set is a commercial one, it will be best to draw first a diagram and then sketch in the wire connections. | with a rag soaked in alcohol, and sand-

get things back in the same fashion as they were at the start.

For a really thorough job everything should be disconnected—all apparatus taken off the panel and unscrewed from the baseboard. Take apart all the wires from the instruments, and leave them in a pile together; put all nuts and screws. including binding posts, in a box so they will not become lost; and stand up the instruments by themselves. The panel will now be free to be cleaned. Use denatured alcohol for most of the cleaning, and give the final polish with a rag wet with some light oil, such as three-in-one. Tighten the wood screws which fasten the panel to the base; quite often the wood has shrunk a little, and you may be surprised to see how much the screws may be tightened. Dust off the wood base and apply a little furniture polish. If the set has a cabinet, use the furniture polish on this, too.

The main thing to do to the instruments is to clean them thoroughly, and that is done in a slightly different way in each case. One of the most important single items is the rheostat. Many operators tune with their rheostats, and so a lot of wear is likely to occur; other persons, having no filament switch, turn the rheostat arm clear around every time they use the set, to turn the battery offthis causes wear. So look carefully at the rheostats; you may decide that they are too worn to put back, but if they are easier to put things back after you have only slightly worn the following is a good procedure: Take off the switch arm, shine it up with a little piece of sandof the places of the various instruments, paper; then wipe off the resistance wire

Having done this, you are sure you can | paper any places that seem rough. Then | ing paste, had been sanded off, and the reassemble the rheostat and see if it jack reassembled, no further trouble deworks smoothly and without unnecessary rubbing; if not, smooth the parts a little

#### Cleaning the Tube Socket

Another very important item is the tube socket. If your set has been out in the open—that is, without a cabinet—it will be best to dismantle the socket completely to clean the accumulated dust. Take off the springs and the nuts, leaving just the shell. Clean the shell with alcohol and look over the springs, polishing them, at the places where the tube prongs touch, with sandpaper. Then put the socket springs and nuts back, reassembling the Telephone jacks are in constant use in

many sets—they are being used to change the connection from phone to loud speaker, and it is quite likely that at some time these jacks may become worn so that they will not work properly. Of course, if the springs have lost their "springiness" it will be best to obtain new jacks. This is seldom necessary, however. Look carefully at the connections, and see if they are clean and soldered securely; scrape the contact points with the tip of a sharp pocket knife, and finish by drawing a thin strip of sandpaper across them to insure clean and perfect contact. In rare cases a jack may prove to be so dirty that it is best to take it apart. The writer had such a case; after the two main screws were removed the jack springs and separators, washers, etc., were laid on the table in the order in which they were removed so that they would be easier to put back. After the corrosion, caused by acid solder- new wires.

veloped

Such large instruments of molded dielectric as variometers can have little the matter with them, especially if the contacts between the rotor and the stator are flexible wires. However, if connections are made through their bearings, these should be inspected, and, if found loose, they should be tightened. If they cannot be tightened it may be best to obtain new instruments, as loose bearings will eventually lead to scraped windings, which soon become worthless. If bearings are slightly loose and the connections run through them the set will be noisy, due to the imperfect contact. In this case new instruments are not needed; simply solder a piece of flexible electric light cord to the two bearings, and they will cease to be noisy. The whole instrument should be cleaned with a rag wet with alcohol to remove dust and grit. Variocouplers should be treated in a similar manner. Variable condensers may have their plates cleaned with an ordinary pipe-stem cleaner.

Transformers, both audio and radio, are not subject to much motion, as are many of the other instruments, and generally all that has to be done is to dust them off carefully and see if all the outside connections are whole and sound.

In reassembling the set first put on the baseboard the instruments that are nearest the panel and wire them according to the diagram. The other instruments will then be ready to place and connect. If some connecting wires seem to be poorly soldered or corroded replace them with

### An Impedance-Coupled Receiver That Brings In All Notes

tendency to turn them down when distortion due to overloading is noticed. This is no remedy; it is an aggravation of the trouble. The control of the volume in the audio amplifier should be by means of input voltage variation, and this is controlled best by varying the radio-frequency amplification.

#### Volume Control

As a fifth volume control means have been provided for cutting out one of the audio tubes from the circuit. This is done by switch S2, which opens the filament circuit of A3 and at the same time sends the output of A2 directly to the plate of | given a little aid. In the first place, trans- | the filament, P to the negative of the plate A3. A switch such as is called for at S2 | formers are usually marked P, B, F and | battery, the positive terminal of the plate radio stores carry them. It is a type of jack switch which closes two contacts and opens one. If one of these cannot be obtained, or if it is not desired to put the switch on the panel, an ordinary doublepole, double-throw switch may be used. Or a still simpler arrangement is to have a flexible lead connected to the plate of A2 and provided with a clip at the other end. This clip may be connected either to the junction point between L7 and C7 or to the junction L8 and C8. When it is in the latter position the tube may be lifted out of its socket or R10 may be removed. This, of course, is less convenient than the switch.

The condenser C1 is used to keep radiofrequency currents out of the plate battery and to assist in keeping out noises. It should preferably be a large one like

There is only one jack, J2, provided for the output. Only one is needed, because if a person intends to use a headset only he will not build this set, and if he has a loud speaker he will not use anything else. If he should want to listen in on the detector he can connect his headset in series

The panel arrangement of this receiver is shown in Fig. 2. Only the centers of the main parts are shown, the locations | amplifier units can be connected in paralof the mounting screws having been | el. The various components are mounted omitted. Of course, this arrangement is on a teak panel, which, if desired, can in only suggested, since it may not fit parts | turn be mounted in a teak traveling

(Continued from page three)

The legends given in Fig. 2 correspond | condenser should be well insulated to prewith those given in Fig. 1, the circuit dia- | vent this. Likewise the switch.

### Transformers in Series

It has been frequently stated that it is very difficult to tell when the windings of a transformer are in series aiding. It is receiver and trying to tell by sound. But it is very simple if the eyes and ears are But it is not at all certain that all manu- the transformer windings are in series

different from those used by the writer. | facturers of transformers mark them cor-

rectly. The above connections may result in series opposing. To make sure run a little test.

The first is simply to connect up a Hartley oscillator, using the transformer as the oscillation coil. No condenser is by looking at it or by connecting it in the needed. First assume that the markings are correct. Then connect G to the grid of the tube, B and F joined together to G. In most cases they are so marked that | battery to the phone, and the other side if B and F are joined they are connected of the phone to the plate of the tube. If in series aiding, or if P and G are joined. the circuit howls when the tube is lighted

### Ocean Liners Reproduce Music

(Continued from page two)

different instruments employed in differ-, case fitted with carrying handles. ent items and to reproduce them in the best possible fashion to suit the acoustics of the hall or room in which the reproducing apparatus is installed.

From the microphone amplifier the output currents go to the microphone control amplifier, which is also a five-tube instrument, the first two tubes being resistancecapacity coupled and connected in cascade with separate adjustable grid resistance. The last three tubes are connected in parallel, and all the tubes, grid resistances and the transformer are inclosed in metal shielding cases.

The final stage of amplification is the power amplifier, which supplies the large amount of energy necessary to operate the sound projectors. This amplifier consists of eight small power tubes connected in parallel, and if a large number of sound projectors is required, several of these

A fourth type of amplifier, called the microphone control and power amplifier, is a single self-contained unit, designed for sound projection on a smaller scale. Seven tubes are used in this instrument, the first three being resistance-capacity coupled in cascade, and the last four connected in parallel, through an interstage transformer. A potentiometer in the grid circuit of the second tube provides a means of controlling the degree of amplification.

#### The Sound Projectors

The sound projectors, so called to distinguish them from the ordinary form of loud speaker used in a small room, have been specially developed on a commercial scale in the Marconi research laboratories, for use with public address and ship

The principle of construction of the instrument is entirely different from that of the ordinary loud speaker. It is due to Sir Oliver Lodge and lends itself to practically unlimited increase in size and power.

howls then the windings are in series aiding. If no oscillation occurs in either case then there is no test. A quicker way of testing the connec-

(2). This discharges the cond

In making the change the only thing that changes is the inductance of the circuit. The resistance and the capacity remain the same for either connection. Hence the change in pitch is due to the change in the inductance, which amounts to four times the mutual inductance between the two windings. This is considerable, particularly for transformers of moderate turns radio.

The time required for the condenser to discharge to a given fraction of its original charge is proportional to the total inductance in the circuit. Hence the series aiding connection gives a discharge of longer duration and it sounds duller. The series opposing connection gives a sound sharper both in pitch and apparent

The change from point (1) to point (2) should be made quickly, otherwise the charge might leak off in transit.

aiding. If no oscillation takes place reverse the terminals of the primary. If it

tions is to set up a circuit like that shown in Fig. 3. Neither the condenser value nor the voltage of the batery is critical, but the values given work. If the condenser is too large the test will not be

First connect the condenser to the battery by throwing the switch to point (1). This charges the condenser up to 45 volts. Then quickly throw the switch to point through the transformer windings and the headset. Now if the condenser is not too large, the circuit formed by the headset, the transformer and the condenser is oscillatory. The oscillations are highly damped, but they persist long enough to enable the listener to tell the pitch. Charge and discharge the condenser several times in rapid succession until the pitch is impressed on the mind. Then reverse the connections of the transformer so that P and B are interchanged. Again note the pitch. The connection which gives the lower pitch is the series aiding.

### Thousands View Radio Exhibits At 258th Artillery Armory

In Addition to the Display of Apparatus Many Interesting Talks, Demonstrations and **Entertainments Were Provided** 

ITH the presentation of a gold cup to Graham McNamee as the most popular announcer in the United States, the Radio World's Fair ended last night in the 258th Field Artillery Armory, after a week of record breaking attendance and a daily revelation of new wireless wonders. It housed on a single floor the largest showing of radio receivers and radio parts ever displayed, and at least \$100,000,000 worth of business was done.

An independent tube manufacturer. for example, scored a record of \$240, | Frew, of Beaver, Pa.-"Miss Radio. 000 worth of business in a single 1925."

"This exposition has amply dem- demonstrations and was a guest of onstrated not only the intense inter- honor at the first wireless tea, at est of millions of people in the de- many theaters and receptions in the turers' Association, who have been in brings. constant attendance at this their of- The wireless tea was given in her

the Pacific Radio Trade Association cake of ice by this beam. Exposition in the Pacific Auditorium Mr. Johnson claims that his ex-

It seemed to work as if by magic. production was much admired. interest that Dr. Donald McMillan, itors.

sive apparatus as for the one and two manufacturers. this interest of the feminine fans night, opening the expe in the person of Miss Rena Jane government.

velopment and improvement of radio studios of the broadcasting stations, broadcasting but firmly established and in addition she made a visit to

the radio as a leader in American in- the Metropolitan Hospital to look dustry, with unlimited possibilities over the radio installation there and for future expansion," was the state- to offer advice based on her long exment made at the conclusion of the perience on the technical side of fair by U. J. Herrmann, managing radio for improving the reception to director, addressing Herbert H. Frost the benefit of the patients who listen and members of the Radio Manufac- so eagerly for the joy that the ether

honor by Sir Thomas Lipton through The Radio Manufacturers' Associa- a radio message. Tea was brewed tion, as one of its final acts, has gone on a cake of ice through the mysteon record as making the Radio rious rays from Bernays Johnson's World's Fair next year one of its wireless light transmitter, just as he three official shows, the others being cooked eggs in a pan on top of a

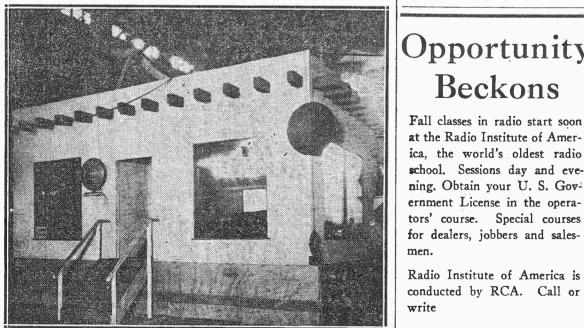
in San Francisco and the Chicago periments at the Radio World's Fair Radio Exposition in the Coliseum. | quickly demonstrated that the so-The chief features of the Radio called death ray may be harnessed World's Fair included the greatest for useful purposes and that it will program of broadcasting ever con- be a simple matter in the next few ducted from a single place. Eight years to light homes and factories stations were linked up by hundreds by a central wireless transmitter. of miles of wire and a central switch- Mr. Johnson, a guest-inventor at the board that was a marvel of ingenuity Radio World's Fair, also gave public in the quick transferring of music demonstrations of the crystal set and song from one station to an- which gave tremendous loud speaker volume. The power tone of the re-

In the center of the armory the ac- Last night and all through the tual broadcasting was witnessed dur- afternoon the big 258th Field Artiling the week by fully 150,000 people, lery Armory at Kingsbridge Road and the great artists of the air, like and Jerome Avenue, in the Bronx, Billy Jones and Ernest Hare, had the was crowded with school children unique experience of actually broad- from the entire metropolitan district casting before a visible as well as in- who were particularly delighted with visible audience. From the time that the marvelous intelligence of the the exposition opened until the exact radio pony, a Shetland, owned by E. moment when the doors closed enter- P. Knapp, who followed the instructainment was going out to millions tions and answered questions on of people. It was a costly gift to the radio subjects and seemed to delight radio fans, and that they appreciated in tuning in various stations on the it was evidenced by the messages radio receiver by using his mouth that came from as far we as Ohio; to move the dials. He also kissed also it may be noted as a matter of Miss Radio and other women vis-

way up in the Arctic, flashed a mes- Rewards were made to fifty amasage that he had heard some of the teur set builders, who showed homeconstructed outfits of unique design Thousands of women were present yet very efficient in operation, from at the exposition, amply demonstrat- the minute crystal sets to elaborate ing that the manufacturers acted eighteen-tube receivers. The awards wisely in putting their sets into were made under the direction of handsome cabinets-the eye appeal Edgar K. James, C. Warfield Kiefer in radio. There proved to be just as and Miss Frew, with the co-operation great a market for the very expen- of engineers representing the large

tube sets. This circumstance may be Many letters were received from attributed to the greatest interest in radio fans reporting the address of radio by women, and in recognition of Governor Alfred E. Smith on Monday the Radio World's Fair entertained ing his appreciation of radio's service throughout the week an official rep- in the enlightenment of the public resentative of the women listeners and a general contribution to good

### The Crystal Studio at the Show



Above is pictured the Crystal Studio, which was located in the center of 258th Field Artillery Armory during the Radio World's New York City Fair. Eight stations linked up with the fair broadcast from this studio every day



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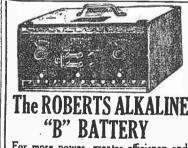
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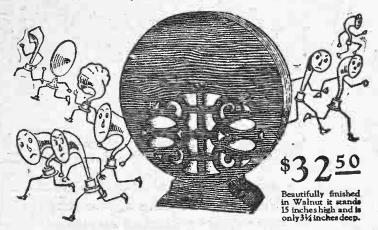
Description of the Army Broadcasting Station

By WILLIAM FORTINGTON

BUILT LIKE A VIOLIN

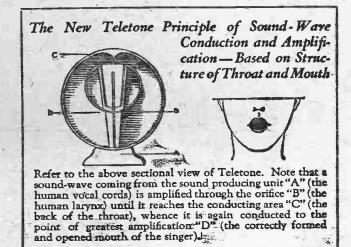
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Marconi Bros. Music Shop

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### Attendance Records Broken as | How Detector 42,000 Jam Into Radio Exhibit

The Greatest Crowd Ever to Enter Grand Central Palace Came on Monday to View the Radio Show, the Manager Says

ITH an average attendance of more than 40,000 daily, the in the other direction.

It is necessary to chop off the lower fourth annual National Radio Exposition at Grand Central half of the modulated wave as i Palace, New York City, held vast throngs spellbound with comes out of the tuner in order to its displays of marvelous developments in radio equipment. The public get a current which will affect a telehad expected to see some new improvements, but it was astounded when phone; this is only another way of it beheld the great panorama of radio progress of the last year spread describing the rectifying action of before its eyes on three floors of the exposition building. The exposition building. tion opened Saturday, September 12, and continued until Saturday use for doing this in radio reception: night, September 19. On Monday more than 42,000 persons jammed The crystal detector and the vacuum into Grand Central Palace, declared by the managers of the building tube. to be the greatest crowd ever to enter the building in a single day. The outstanding features of the 400 \$

xhibits of leading manufacturers are the extraordinary developments n the production of loud speakers that reproduce broadcast programs methods and for the spreading out narily required, thus eliminating upthe great strides made by set manu- of the scale. All manner of special tube is an intricate science, and no facturers in improving the appear- condensers were very much in evi- attempt will be made here to explain ance of receiving sets, making them dence at the exposition. Also, low- the theory of it. pieces of furniture of unusual loss design played an important role Originally, the two-electrode tube beauty and suitable to take their place in the living rooms of thou- of sharpening the tuning. sands of homes; the phenomenal advance in perfecting equipment that permits the operation of tubes and currents, with the consequent eliminchild, and, because of the elimination that must employ dry cells. of dials, thereby permitting the at- The public's demand for radio re- cuit a small fixed condenser, usually

cause of its all-embracing range of battery eliminators and ingenious ohms) to 3 or 4 megohms. Most pitch and its non-resonant character- battery rechargers. There were many commonly the leak is parallel with istics. Its excellent tonal qualities. B battery eliminators shown at the the grid condenser, but with some in addition to its attractive appear- exposition, most of them making use tuners it is found better to run the ance make the cone speakers popular. of special rectifying tubes, trans- leak directly from the grid post of being shown at the exposition, some eral radio receiving sets on exhibit turn runs from the tuner.

suggest the usual loud speaker. so that the storage batteries are variations in the plate current. that will fill the immense exposition seem that present practice is more coil here referred to may be either

Examination of the working parts of the radio receivers exhibited reyeals refinement in many details. For one thing, there has been a marked change in the audio-frequency transformers. Instead of small transformers designed mainly for volume, the more carefully designed receivers contain larger transformers with plenty of iron and with characteristics which make for distortionless amplification. The best without a trace of an alternating In the case of the tickler circuit loud speaker in the world would current hum. ound like a tin horn with some of frequencies uniformly. Hence, some radio industry has become stabilized. the larger and properly designed many variations. The neutrodyne transformers have changed all that. family is very well represented, for ances and many other improved de- eration and excellent results, seems vices are also in evidence at the to hold its own. The super-heterofourth annual National Radio Expo- dyne is also popular among the radio sition at Grand Central Palace. Ob- offerings. The acme of tuning and viously every effort has been made sensitivity has been attained in many tonal quality as well as ample volume improvements of the future will be

straight-line frequency operation- position one finds instead of the dials a small condenser. that is to say, the condenser dials tuning wheels with just the milled In any method of regeneration the arate the existing congestion with tremely delicate adjustments.

advent of some 600 broadcasting sta- trial exhibits were staged. These in their clearness and become mushy. tions in regular operation. For that cluded how radio panels were en- The amount of regeneration should reason radio receivers of the past graved, how vacuum tubes, material, always be kept under this point, as a were not designed to handle fifty silk covered wire and aluminum con- self-oscillating tube by producing or more stations within the narrow denser plates were manufactured beat notes heard as squeals is likely confines of the broadcast wave band, and how photo-radiograms were to disturb all receivers in the neigh-Consequently, with the present con-transmitted and received.

sets directly from home alternating hand and battery eliminators on the present time the three electrode or other. There will always be a de- electron tube (audion) is used, beation of batteries; the incorporation mand for dry cell receivers, for we cause the addition of the third eleof the single control principle in still have 6,000,000 farm homes with ment of grid produces an amplifying many of the new models, making out electric service. Then there are as well as a rectifying action. them easily tuned by a woman or a portable and semi-portable receivers In order to make the tube rectify

a high rate of charge. Certainly this variometer in it.

strengthening it.

in the present offerings to obtain of the better kinds of sets, and the . The tuning of the plate circuit by inserting in it a variometer and also for all requirements. And it is in in the nature of refinements of de- a fixed condenser across the output the refinement of the little things tails. Although several new circuits of the detector unit actually has an that the perfection of the receiving are being introduced at the exposi- effect very similar to that of the set as a whole has been realized. tion, most of the circuits remain tickler, though its cause is not so Aside from tonal quality, the ne- more or less the same. The exterior, apparent to the beginner. The transcessity for sharper tuning is admitted however, of the receiving sets has fer of energy from the plate circuit and met in virtually all the receiving undergone quite a transformation. back to the grid depends in this case sets shown at the national exposi- A year ago the standard practice was on the fact that the two circuits are tion. Condensers, which now have to use the large tuning dials with actually coupled through the capacity become the generally accepted means graduations and numbers engraved existing in the detector tube, its grid of tuning, are especially designed for on the rim. In the sets at the ex- and plate acting as the two plates of

spread out the wave lengths at the rim coming through a slot or small feed-back action is practicable only lower end of the scale so as to sep- knobs which control verniers for ex- up to the point where self-oscillation the older types of receiving sets. In addition to the exhibit of radio tion point the effect is to cause the Four years ago no one foresaw the sets many interesting radio indus- sounds heard in the phones to lose

### Tubes Amplify Radio Signals

A detector is simply a rectifier which allows current to pass in only one direction, stopping it off when the voltage tends to force any current

gestion in radio broadcasting, espe- vices give very good results for shortcially among the low wave lengths, distance reception and have the great the time has come for sharper tuning advantage that no battery is ordiwith unprecedented fidelity of tone; of wave lengths at the lower end keep expense. Detection by vacuum

in most receivers, for the purpose was used, just as in a battery charg-When it comes to the operation from flow, minus to plus, is always of the vacuum tubes the trend is from the hot filament to the cold decidedly toward dry cells on one plate-never the other wax. At the

ceivers that can be operated directly a .00025 mfd, with a grid leak. The The cone type of loud speaker on the house lighting circuit has latter is usually a fixed high resistseems to be in the ascendancy, be- been answered by a wide variety of ance of from 1/2 megohm (500,000 Numerous cone loud speakers are formers and filter condensers. Sev- the tube socket to which the grid re-

of them well known makes and others were operated entirely from house Regenerative tuner-detector units current. The A battery problem are still widely used. In discussing As a sample of what quality can seems most aptly met by various them it is simpler to think of the be obtained by loud speakers, visitors ingenious combinations of storage tuner and detector as one unit, since to the exposition are treated to broad- batteries and rechargers, built in in all forms of regeneration it is it cast reception as rendered by two compact, clean, simple units. By object to feed-back some of the pla huge Hewlett induction type loud means of chemical and tube rectifiers, circuit energy to the tuner or grice speakers suspended over the side it becomes possible to recharge stor- circuit, thus strengthening the grid aisles. These units have nothing to age batteries at a very slow rate, voltage so as to produce still stronger

With their spiral windings supported always ready for use. These devices There are two principal schemes of on radial arms, and with their con- are called "trickle" chargers and con- connection to bring about this result. cealed aluminum diaphragms sup- sume almost negligible current as The first is to run the plate current ported between the spiral windings, compared with the rather heavy cur- through a coil known as the tickler they seem more like decorative de- rent consumption of the usual re- coil, which is coupled to the tuner vices than powerful loud speakers charger. In other words, it would coil in the grid circuit. The tuner building with sweet, far-reaching, toward recharging the storage bat the single inductance used in a teries between operations at a slow single-circuit tuner or the secondary but steady rate of charge rather than of a two-circuit tuner. The second to let the storage batteries discharge scheme of feed-back is to tune the entirely and then recharge them at plate circuit, usually by inserting a

new practice has the advantage of In the first the amount of regeneraproviding reliable current at all tion is adjusted by varying the extent of coupling of the tickler with The battery eliminator problem has the tuner coil, usually by rotating been solved. A complete radio re- the tickler coil within it. In the secceiver of the super-heterodyne type, ond type of regenerative circuit the selling for close to \$600, operates amount of feed-back is regulated by directly on the usual lighting circuit the variometer in the plate circuit.

the principle of operation is not difthe audio-frequency transformers of ceiving sets shown at the exposition the tickler coil being coupled to the the past which failed to amplify all leave the firm impression that the tuner coil induces in it a voltage of notes caused a blast, while others The radio frequency circuit is promwere simply chopped off. But now inent, although it is represented by sound, like the oscillations already By-pass condensers, special resist- this circuit, with its simplicity of op- other. Consequently, it will be nec-

There are two devices in common

ing rectifier. The direction of elec-

or detect we insert in the grid cir-

present in it. The two effects may essary to reverse the connections of the tickler if it is found to be weakening the reception instead of

begins. If carried beyond the oscilla-

### Located at Bedlow's Island This Transmitter Is Equipped So 'That Either Telegraph or Telephone May Be Used

HIPS that ply their way up and down | stations of the Eastern states. At present | visible in a separate milliammeter. These | ploy a separate exciter to excite the fields the Hudson, both liners and tugboats, most operating is done by remote control are little aware that upon Bedlow's from Governor's Island, an operator being Island, where the Statue of Lib rty is left in attendance at the power plant located, there is something more than the edifice signifying American liberty.

It is common knowledge also that there is a military station of a handful of men | are sometimes curious as to what is conat this point, but many people will show | nected at the other end of the huge ansurprise when told that there exists upon tenna located at Fort Wood. It was with this island one of the first broadcasting this curiosity that the writer during the ceivers used by amateurs in the Eastern

where the apparatus and antenna are located.

Trippers visiting the Statue of Liberty

milliameters are inclosed in two sets of three, as shown in the photograph.

The microphone visible in the photograph is seldom used, as an external one was found to be more efficient. A point of interest to most readers will be to know that this station always operates above 1,000 meters, and is, of course, inaudible on the present-day average receiver. Of course, in its day—that is, when WVP was used for broadcasting—the majority of re-

of this large generator.

The large handle in the middle of the panel, when switched in one direction. starts up the generator automatically and connects up the various parts of the circuit, such as filament of the tubes. Morse keys and other apparatus necessary for its daily working as a military station.

The other instruments visible on the panel are the aerial ammeter, the high tension or plate supply voltmeter and the filament voltmeters of the tubes. All the apparatus is contained in a rugged iron frame at the rear of the panel.

Returning once more to the question of radiophone transmission from this station, the writer can recall during one of his visits that two-way communication was established with a military station at Chicago in broad daylight. The speech was perfectly clear, accompanied by, of course, a little static, which was only to be expected at that time of the year.

WVP is heard many miles out at sea constantly by seagoing operators, and it is quite obvious by this that this station is capable of covering great distances under favorable conditions. This is accomplished on a wave length between 1,000 and 1,300 meters.

### CW or Telephone Used

Owing to the method of construction employed in the set, it is possible to change over quickly from CW transmission to phone. A touch of a few switches is all that is required. It is, therefore, obvious how this station could be operated until 5 or 6 o'clock upon its usual duties namely, military communications and then change over to a phone transmitter for the entertainment of the eager

Viewed from the top of the Statue of Liberty, the aerial passes almost unnoticed, but as soon as one reaches the base of a tower its immense size becomes apparent. Although at the moment the writer cannot recall the exact height of the masts, it might be stated that they are within the region of 200 to 300 feet above the earth. Some idea of the height will be gained by the accompanying photograph, illustrating one of the masts, which is located over the power house.

The receiver in the right-hand foreground is one of the universal variety and is capable of covering a wide band of wave lengths which is necessary for in-

The keys are visible upon the table, together with the rest of the apparatus The power plant is located in a separate room, access to which is gained by the necessary for commercial working. The door at the left of the picture. A 2,500reader cannot fail to notice the two lead-in wires passing through the walls rent. Six radiotron UV-204 tubes are volt generator is used, giving 1½ amperes, day in the field of broadcasting, it was in used, three oscillators and three modula- driven by a suitable motor. Owing to this of the room. These are one-quarter of its time one of the leading broadcasting | tors. The plate current on each tube is | high voltage it is found necessary to em- | an inch square copper bus bars.

### Bob's Class Buys a Radio Receiving Set

(Continued from page one)

Two views of Station WVP

summer of 1924 found a pioneer of the 1 states covered an enormous wave band.

honor of tuning in on the new set she had ordered and which would be installed for the next night.

stations in the United States and perhaps

This station is owned and operated by

the United States Army Signal Corps

for communications of a military nature

between the New England states and New

York. Although it is a back number to-

in the world.

I kinder thought that the president oughter be me or Billy, for we know a lot about radio, and at the meeting Billy nominated me for president. Mollie Malone, who is sweet on Yaller, nominated him. As a politician I got to hand it to Yaller he is a regular Old Smooth which is what the Democrats call the boss of the Republican party in Ponckhockie.

Yaller's father runs a candy store and he had got his Dad to give him a lot of old lollypops and around each one he wrapped some paper on which he wrote "Vote for Ralph Selgood for President" and gave all the girls one free. Girls will do anything for candy and they all voted for him and he was 'lected.

Then to rub it in Yaller nominated the Malone girl for vice-president and she was Tected action and reference

"Yaller sure put it over on us," observed Billy to me after the lection. "I ain't through with him yet," I replied, and Billy asked me what I was go-

ready with any plan yet, but no feller like Yaller was going to get the best of me if Miss Osgood said that the Radio Club would hold its first meeting that evening

world's broadcasters which to-day goes

In its day of operation as a radiophone

station the operators and engineers at

WVP were the recipients of numerous

gifts as a return for the programs trans-

mitted, which, incidentally, were mostly

gramophone music. To-day the radio

listener is not nearly so enthusiastic in

acknowledging programs and efforts of

The transmitter at WVP, the call let-

ters of the station, is a General Electric

set of 31/2 kilowatts input, working at

11/2 kilowatt antenna efficiency. This

station puts 31/2 amperes into the aerial

on radiophone. On continuous wave, as

it is used for military communication, it,

of course, gives a much higher aerial cur-

the broadcasting stations.

and that President Ralph Selgood would preside and operate the radio set. "Are you going to the club meeting?"

asked Billy. "Well, I should smile," said I, and then

we dropped the subject for the time being. Billy came around for me that evening and we went over to the school kinder early, but Yaller and that Malone girl were there ahead of us and Yaller stuck his finger on his nose to me.

Billy wanted me to plug him one on the beezer, but I bided my time, knowing of a better way to get hunk with him.

When all the club was assembled Miss Osgood, who had been lected secretary as she knew more than any one else, called the meeting to order and introduced President Selgood who she said would preside. Yaller got up and went to the front and

ing to do about it, but I said I wasn't, made a speech about how he would let actions speak louder than words, and then as it was 8 o'clock he started to tune in on the new set. You could hear a pin drop as Yaller

The set at the left of the photograph is

a 100-watt continuous wave transmitter

which has several distinct records to its

credit. This set up to last year was in

constant use. It was not used for broad-

casting purposes. Returning once more

to the big set, it will be noticed that there

are two extremely large inductances at the

top right hand corner of the picture.

These are not the tuning inductances of

the set, as might generally be supposed,

but are a part of the apparatus for elimi-

nating harmonics which are radiated by

this transmitter and were at one time a

source of considerable annoyance to

listeners on other wave lengths.

fiddled with the dials, but the more he fiddled the less results he got and his face began to ware an anxious look and he was about to say something about maybe the set hadn't been hooked up right when there was the goshawfulest sound that seemed to burst right out of the loud speaker.

Yaller jumped about ten feet in the air and some of the girls giggled hysterical-

Then there followed the weirdest, eeriest sound that fairly set your teeth on edge and drove cold shivers up and down your spine, and little Millie Samson, a colored girl who lives on Gill Street, rolled her eyes, plopped down on the floor and howled: "Oh, Lawdy, it's the whale of a lost soul.

Then the lectric lights snapped out, plunging the room in darkness, "Stop that noise at once!" commanded

Miss Osgood, but no one could hear her on account of the girl's hollering and the spine-shivering sounds that seemed to come from the loud speaker. By this time some one got to the 'lectric

light switch and turned on the lights.

When things quieted down some Miss Osgood said the meeting would stand adjourned to the next day, when there would be a thorough investigation.

Me and Billy skinned out in a hurry after that and I removed the extra big ticktack I had attached to the window pane back of the radio set and stuck it in my pocket. "That sure is a humdinger of a tick-

tack," said Billy, and I agreed with him. After fixing it on the window before the club meeting we had run the cord into the schoolroom where it wouldn't be noticed and all I had to do was pull the string and the good old ticktack did the rest.

"That wasn't a bad idea of yours in dousing the lights," said I to Billy. "Nor that of yours in fixing the radio

set so Yaller couldn't work it," said he. Then we both laffed and Billy said, "You sure got hunk with Yaller all right."

## The Herald Tribune Daily Broadcasting Programs for Week Ending September 26

#### TO-DAY

- WJZ-NEW YORK CITY-455 m.-Children's hour: Stories, in comic stories.

  10:40 a. m.—Chimes from Grace Church.

  11 a. m.—West End Presbyterian Church services.

  2:30 p. m.—Sunday Radio Forum.

  7 p. m.—Nathan Abas's Orchestra.

  8 p. m.—Scores; news.

  10 p. m.—Godfrey Ludlow, violinist.

  10:30 p. m.—Bews.

  WJY—NEW YORK CITY—405
- WJY-NEW YORK CITY-405
  8:15 p. m.—Ada Kehlman, soprano; Minnie
  Weil, planist.
  9:16 p. m.—Francis G. Barrett, tenor.
  9:30 p. m.—Freminiscences of a Reporter."
  WEAF-NEW YORK CITY-492
  3 p. m.—Sunday hymn sing.
  4-5 p. m.—Interdenominational services; address by the Rev. William Leach; Federation Quartet.
  7:20-9:15 p. m.—Capitol Theater Gang.
  9:15-10:15 p. m.—Symphony Orchestra.
  WGBS-NEW YORK CITY-316
  3:30 p. m.—Program from Warner's
- WGBS—NEW YORK CITY—316
  3:30 p. m.—Program from Warner'
  Theater,
  8 p. m.—Opera, "Cavalleria Rusticana,"
  chorus and complete orchestra,
  WHN—NEW YORK CITY—361
- m.—Marsh McCurdy, organist. p. m.—Queens County Christian E deavor program. County

  deavor program. Dance Orchestra.

  7:30-10 p. m.—Church services.

  10:45 p. m.—Janssen's Orchestra.

  WMCA—NEW XORK CITY—341
- WMUA-NEW

  11 a. m.-12:15 p. m.—Christian
  Services.
  6-7 p. m.—Roemer's Homers.
  7 p. m.—Ernie Golden's Orchestra.
  7 m.—Olcott Vail's String Er p. m.—Olcott Vail's String Enser WRNY—NEW YORK CITY—259
- m.—Novello Davies' Singers.
  m.—"Daily Courage."
  WNYC—NEW YORK CITY—526 8:50 p. m.—Baseball results.

  9 p. m.—Brooklyn Mark Strand Theater.

  WFBH—NEW YORK CITY—273
- WFBH—NEW YORK CITY—273

  5 p. m.—Band.
  5:30 p. m.—Orchestra.
  6 p. m.—Masonic News.
  6:15 p. m.—Asterio Fernandez, tenor.
  6:30 p. m.—Bossert Lumber Jacks.
  7 p. m.—Franklin Hour.
  WBBE—STATEN ISLAND, N. Y.—273
  p. m.—Band.
  10:15 a. m.—L. Marion Brown, soprano,
  10:30 a. m.—Bible lecture.
  11 a. m.—L. Marion Brown, soprano, or chestra selections:
- estra selections: nn.—Choral singers; violin choir. p. m.—Bible lecture, Judge Ruther
- s.oo p. m.—Bible lecture, Judge Ruth ford.

  10 p. m.—Singers: Violin Choir.

  WGCP—NEWARK—252

  8 p. m.—Polla's Orchestra.

  8:15 p. m.—Ralph Hersh. violinist.

  8:30 p. m.—Millian Gordone, contralto.

  9 p. m.—Celtic Guild Concert.

  9:45 p. m.—Isabelle Henderson, soprano

  10 p. m.—Henry Segal. tenor.

  10:15 p. m.—W. C. Polla's Orchestra.

  WFI—PHILADELPHIA—395

  10:20 a. m.—Services.
- 10:20 a. m.—Services. WLIT—PHILADELPHIA—395
- 6-7 p. m.—Concert orchestra.
  7:30 p. m.—Dream Daddy.
  WCAU.—PHILADELPHIA—278
  5 p. m.—Barry O'Moore, tenor.
  5:15 p. m.—Undenominational radio church.
  WOO—PHILADELPHIA—508 2:30 p. m.—Musical exercises.

  B p. m.—Sacred organ recital.
- p. m.-Evening services.
  WPG-ATLANTIC CITY-300 m.—"Jubilee Songs"; organ. WHAR—ATLANTIC CITY—275
- p. m.—Short sacred recital.
  p. m.—Sermon, Rev. C. D. Sinkin
  p. m.—Evening service.
  m.—Seaside Trio. p. m.—Seaside Trio. 11:15 p. m.—Strand organ recital. WRW—TARRYTOWN, N. Y.—273
- p. m.—Services, p. m.—Musical program. WGY—SCHENECTADY—380 a. m.—Service.
  0 p. m.—Service.
  b. m.—Studio program.
  WGR—BUFFALO—319
- m.—Vesper services.
  m.—Evening service.
  WJAR—PROVIDENCE—306 7:20-9:15 p. m.—Capitol Theater 9:15 p. m.—Symphony orchestra. WEEI—BOSTON—349
- 7:20 p. m.—Capitol Theater Gang. 9:15 p. m.—Symphony orchestra. WCTS—WORCESTER, MASS.—268 7:20-9:10 p. m.—Capitol Gang. 9:15 p. m.—Symphony orchestra. WBZ—SPRINGFIELD, MASS.—333
- 1 a. m.—Church services; organ and of twenty-four voices. WCAP—WASHINGTON—169 12 noon—Service.

  5 p. m.—Service.

  7:20-9:15 p. m.—Capitol Theater Gang.

  9:15 p. m.—Symphony orchestra.

  KDKA—PITTSBURGH—309
- 10:40 p. m.—Church service. 6 p. m.—Baseball scores. 6 p. m.—Basecal Service. 7:45 p. m.—Church service. WCAE—PITTSBURGH—461
- pf m.—Dinner concert.
  p. m.—Capitol Theater Gang.
  WEAR—CLEVELAND—390 .—Theater orchestra. .—Music. WLW—CINCINNATI—422 8:30 p. m.—Church services. 9:30 p. m.—Concert. WKRC—CINCINNATI—326
- 7:45 p. m.—Songs and service.
  11 p. m.—Classical program.
  12 midnight—McKay's Orchestra.
  WSAI—CINCINNATI—326
- 4 p. m.—Sermonette; chime concert.

  WWJ—DETROIT—353
  7:20 p. m.—Capitol Theater Gang.

  WLS—CHICAGO—345
- 8:30 p. m.—Organ solos.
  9 p. m.—Little Brown Church.
  WCBD—ZION, ILL.—345 10 p. m .- Musical program.

### MONDAY

- WEAF—NEW YORK CITY—492
  6:45-7:45 a. m.—"Health Exercises.
  10:45 a. m.—Home Service talk.
  11:30 a. m.—Home Service talk.
  11:30 a. m.—"Fashion Forecast"; songs.
  12 noon.—Market and weather reports.
  4 p. m.—Walter Preston, barytone;
  Jeanne Kramer, planist.
  4:45 p. m.—Windian Legends." Marie
  Rooney.
  6 p. m.—Dinner music.
  7 p. m.—Myro Glass, barytone.
  7:15 p. m.—Musical program from Strand
  Theatre; remarks by Joseph Plunkett;
  vocal and instrumental artists.
  8:30 p. m.—Tower Health Talk."
  8:45 p. m.—Hemstreet Singers.
  9 p. m.—Gypsies.
  10 p. m.—Gypsies.
  10 p. m.—Guseppe di Benedetto, tenor.
  10:30-11:30 p. m.—Ben Bernie's orchestra.

- 10:30-11:30 p. m.—Ben Bernie's orchestra.

  WMCA—NEW YORK CITY—341

  11 a. m.—Snedden Weir, Helen Morris,
  11:45 a. m.—A. V. Llufrlo, planist,
  12:30-1:30 p. m.—Women's Arts Exposition; Press luncheon,
  3-3:30 p. m.—Women's Arts Exposition; Press luncheon,
  6 p. m.—Olcott Vail's String Ensemble,
  6:30 p. m.—Emile Golden's Orchestra.
  7:30 p. m.—Lullaby music,
  8 p. m.—Lecture on Christian Science,
  9 p. m.—Florence Knapp, "Trail Blazers."
  9:10 p. m.—Talk, Mrs. Franklin D. Roose,
  Welt,
- 9:20 p. m.—Helen Boswell, "Women in

- WJZ—NEW YORK CITY—455

  m.—Women's hour.
  m.—Meyer Davis's Orchestra.
  , 5:20, 8 and 10:25 p. m.—News.
  p. m.—Scores, racing (half-hourly).
  p. m.—John Daniel, readings. 5:26 p. m.—Market reports.
  5:50 p. m.—Market reports.
  5:50 p. m.—Financial summary.
  7:25 p. m.—Organ recital.
  8 p. m.—Scores, racing results.
  8:15 p. m.—"State Police."
  8:30 p. m.—Program from Landay Hall.
  10:30 p. m.—Joseph Knecht's Orchestra.
- WHN-NEW YORK CITY-361
- m.—Children's Hour.
  m.—Dora Rose, soprano.
  p. m.—Songs and orchestra.
  m.—Storage battery talk.
  p. m.—Roseland Dance Orchestra.
  p. m.—Rubey Cowan, songs.
  p. m.—Moe Mann, barytone. p. m.—Alfred Dulin, planist.

  15 p. m.—Billie and Marie Van, singers.

  30 p. m.—John Harthedy, tenor.

  45 p. m.—Mr. and Mrs. Leo Wood, songs.
- ! p. m.—Marsh McCurdy, organist 1:30 p. m.—Revue. 2 p. m.—Ted Lewis's Orchestra. WRNY-NEW YORK CITY-259 .-Radio Industry Hour.
- 1 p. m.—Radio Industry Hour.
  1:02 p. m.—High spots in sports.
  1:10 p. m.—Studio features.
  1:45 p. m.—Popular songs.
  7 p. m.—High spots in sports.
  7:05 p. m.—"Whose Birthday To-day?"
  7:10 p. m.—Commerce of the day.
  7:15 p. m.—Code lessons.
  7:35 p. m.—"Geography," Major Atkinson
  7:50 p. m.—The Lullaby Lady.
  8:30 p. m.—Painter's series.
  8:45 p. m.—"Silver Threads."
  8:50 p. m.—"Jazzing the Scarf Dance."
  9 p. m.—"Who Pays Radio Broadcasting?"
  9:15 p. m.—Mysic travelogue.
- 9:20 p. m.—"Who Pays Hadio 2: 9:15 p. m.—Music travelogue. 9:20 p. m.—"In Spain." 0:45 p. m.—New songs. 10 p. m.—The Poetry Post. 10:15 p. m.—Plano dance. 10:30 p. m.—Indiana Ramblers.
- 10:30 p. m.—Indiana Ramblers.

  WNYC—NEW YORK CITY—526
  7 p. m.—Market high spots.
  7:10 p. m.—Stony Brook Orchestra.
  7:30 p. m.—Police alarms.
  8 p. m.—World Series." John Foster.
  8:15 p. m.—Harold Muer, barytone.
  8:35 p. m.—Tobias Bloom, violinist.
  8:50 p. m.—Anna Kelstein, soprano.
  9:10 p. m.—Tobias Bloom, violinist.
  9:26 p. m.—John Hepler, pianist.
  9:40 p. m.—Rosel Benda, soprano.
  10 p. m.—John Hepler, pianist.
  10:10 p. m.—"Trend of the Times"
  10:30 p. m.—Police alarms; weather.

  WFBH—NEW YORK CITY—273
- WFBH-NEW YORK CITY-273 p. m.—California Orchestra.
  p. m.—Studio program.
  p. m.—Studio program.
  p. m.—Knickerbocker Hospital talk.
  15 p. m.—Hauser and Cross, two pianos.
  p. m.—Majestic String Ensemble.
  1:30 p. m.—Majestic String Ensemble.
  1:30 p. m.—Alvin Hauser's "At Home
  Party."
- WOKO-NEW YORK CITY-233 8:15 p. m.—Anna Diamond, pianist. 8:35 p. m.—Billy Inlofeld, pianist. 9 p. m.—Golonial Dance Orchestra. 9:30 p. m:—William Mahoney, barytone, 9:45 p. m.—Colonial Dance Orchestra. WBBR-STATEN ISLAND, N. Y.-273
- WAHG-RICHMOND HILL, N. Y .- 316 2:30 p. m.—Musical program.

  :30 p. m. to midnight—WAHG birthday party; artists; Serenaders' Quintet; Vic's Orchestra.
- party; artists; Serenaders' Quintet; Vic's Orchestra.

  WOR-NEWARK—405
  6:15-7:15-7:45 a. m.—Gym class.
  2:30 p. m.—Annette White, violinist,
  2:45 p. m.—Florence Poyet, soprano.
  3 p. m.—Dorothy Hall.
  3:15 p. m.—Annette White, violinist.
  3:30 p. m.—Florence Poyet, soprano.
  3:45 p. m.—Talk, Betsy Talbot.
  6:15 p. m.—Words misprouounced.
  6:17 p. m.—Words misprouounced.
  6:17 p. m.—Selton Ensemble.
  7:30 p. m.—Al Lynn's music master.
  8 p. m.—Jack Smith, entertainer.
  8:15 p. m.—Benjamin de Casseres, author.
  8:30 p. m.—Talk, Edward Bierstadt.
  9:45 p. m.—Julius Seebach, barytone.
  10 p. m.—Southe and Tobin, vaudeville.
  10:16 p. m.—Bergen Quartet.
  10:30 p. m.—Julius Seebach, barytone.
  10:45 p. m.—Southe and Tobin, vaudeville.
- WGCP-NEWARK-405
- WGCP—NEWARK—405
  2:45 p. m.—Songs; race results.
  3:30 p. m.—Jazz band.
  4:30 p. m.—Songs.
  8 p. m.—Piano solos.
  8:30 p. m.—Lillian Gordone, contraito.
  8:45 p. m.—Strickland's Orchestra.
  9 p. m.—Vincent Laine, tenor.
  9:15 p. m.—Rennedy Harmony Quintet.
  9:45 p. m.—Raymond Maher, barytone.
  10 p. m.—Strickland's Orchestra.
- WAAM-NEWARK-263 WAAM—NEWARK—263

  11 a. m.—Happy Hour program.
  7 p. m.—Jack Press's Orchestra.
  5:15 p. m.—McGregor Brown, baryton
  8:30 p. m.—Sweet Marie; Buttercup.
  9 p. m.—Smiles and Giggles.
  9:20 p. m.—Irma Leiss, soprano.
  9:30 p. m.—Barytone and soprano sol
  10 p. m.—Fred Frey's Orchestra.

  WFI—PHILADELPHIA—395
- m.—Orchestra.
  m.—Artists' recital.
  p. m.—Fashion feature.
  p. m.—Roof garden broadcast.
  WLIT—PHILADELPHIA—395 12 midnight—Kentucky Orchestra.

  WMCA—NEW YORK CITY—341

  11-12 a. m.—Ida Allen's hour.

  12 noon—Olcott Vail's String Ensemble.

  12:30 p. m.—Political celebrity lunched from Women's Arts Exposition.

  3 p. m.—Women's Arts Exposition.

  6 p. m.—Olcott Vail's String Ensemble.

  6:30 p. m.—Frank Gibbia's Orchestra.

  7 p. m.—Women's Arts Exposition.

  8 p. m.—Lanson's Orchestra.

  8:30 p. m.—Sheppard Knapp musical.

  9 p. m.—Asbury Park Dance Orchestra.

  10 p. m.—Women's Arts Exposition.

  10:30 p. m.—Lew Krueger's Orchestra.

  11 p. m.—Ernle Golden's Orchestra.

  WRNY—NEW YORK CITY—259
- organ,
  0 p. m.—Dance orchestra.
  0:30 p. m.—Vaudeville features,
  WIP—PHILADELPHIA—508
- m.—Bedtime story,
  WCAU—PHILADELPHIA—278
  m.—Recital.
  m.—Danny Dougherty, songs,
  p. m.—Entertainment, 10 p. m.—Dance music.

  WOO—PHILADELPHIA—508
  12 (neon)—Lunchson music,
  4:45 p. m.—Grand organ; trumpets,
  7:30 p. m.—Dinner music.
- 11 p. m.—Ernle Golden's Orchestra.

  WRNY—NEW YORK CITY—259

  12:02 p. m.—Bunn Trio.
  1 p. m.—Radio industry hour.
  1:02 p. m.—High spots in sports.
  1:10 p. m.—Studio program.
  7 p. m.—"Whose Birthday To-day?"
  7:05 p. m.—"Sports."
  7:10 p. m.—Commerce of the day.
  7:20 p. m.—History series.
  7:30 p. m.—Law series.
  7:45 p. m.—"Costume of the Theater."
  8 p. m.—Concert orchestra.
  8:15 p. m.—Light Opera Ensemble.
  9 p. m.—"Brakes," C. E. Ranch.
  9:15 p. m.—Sadrian Trie. 8 p. m.—Musical program from E. Y.
  Strand Theater,
  8:30 p. m.—Ethel and Dorothea Ponce, Follies."

  5:50 p. m.—Dancing school program,

  70 p. m.—Finale, by Jack Wilbur,

  10:30 p. m.—"Marjorie," Theodora Irvinz.

  10:30 p. m.—Cameron Emslie, planist.

  7: p. m.—Dance music.

- WPG—ATLANTIC CITY—300
  4:30 p. m.—Tea music.
  6:40 p. m.—Baseball scores; organ recital.
  7 p. m.—Trio dinner music.
  9 p. m.—Traymore Concert Orchestra.
  10 p. m.—Steeplechase Dance Orchestra. WHAR-ATLANTIC CITY-275 7 p. m.—Market high spots.
  7:10 p. m.—The Canadians; police alar
  8:05 p. m.—James Brennan, cornet.
  8:25 p. m.—Janet Finn, soprano.
  8:45 p. m.—William Claire, tenor.
  9 p. m.—Simon Condosta, flutist.
  9:15 p. m.—John Morehead, barytone.
  9:30 p. m.—Spanish recital.
  10:10 p. m.—Barney Graham, songs.
  10:30 p. m.—Police alarms; weather. m.-Stories for little folks. -Seaside Trio.
- WGY-SCHENECTADY-380 WRW-TARRYTOWN, N. Y.-273 p. m.—Stories; scores; music.
  p. m.—Musical program; scores.
  p. m.—Concert.
  p. m.—Entertainment.
- WGR—BUFFALO, N. Y.—319
  3:30-7:30 p. m.—Dinner music.
  p. m.—Marion Shaw concert.
  3:30 p. m.—Piano recital.
  0 p. m.—Boris Golokow, mandolin.
  0:15 p. m.—Jack Little, songs.
  11 p. m.—Jack Little, songs.
  12 p. m.—Concert by group of artists quartet.
- quartet.
  9.45 p. m.—"Progress of Radio in Eng land," William Fortington.
  10.30 p. m.—Wilson's Dance Orchestra.
  WTIC—HARTFORD, CONN.—475 6:30 p. m.—Dinner music; weather; score WEEI—BOSTON—349 WEEI-BOSTON-349

  3 p. m.—Organ recital.
  6:30 p. m.—Big Brother Club.
  7:20 p. m.—Lest and Found; scores.
  7:30 p. m.—Brockton Fair broadcast.
  8:30-10 p. m.—Program same as WEAF.
  WJAR—PROVIDENCE—306

  10 a. m.—Housewives Exchange.
  1:05 p. m.—Studio program.
  8 p. m.—"Berry Time."
- 0 p. m.—"Music by Gypsies."
  WBZ—SPRINGFIELD, MASS.—333 p. m.—Capitol Theater Orchestra,
  p. m.—Capitol Theater Orchestra,
  p. m.—Aleppo Drum Corps,
  130 p. m.—Capitol Theater Orchestra,
  0 p. m.—Organ music,
  0:30 p. m.—Philharmonic Male Quartet,
  0:45 p. m.—Goldenaires-Trumpet Quart
- WRC-WASHINGTON-469
- 11 p. m.—"Post" hour.

  KDKA—PITTSBURGH—309
  3:30 to 7 p. m.—Scores (half-hourly).
  9:45 p. m.—Musical program. TUESDAY
- WJZ-NEW YORK CITY-455 WJZ—NEW YORK CITY—155
  10 a. m.—Women's Hour.
  1 p. m.—Women's Hour.
  2, 4, 5:20, 8 and 10:55 p. m.—News.
  4:6 p. m.—Scores, racing (half-hourly).
  5:26 p. m.—Market report.
  5:50 p. m.—Financial summary.
  7:p. m.—"Alredale Terriers." Frank Dole,
  of the Herald Tribune.
  7:16 p. m.—Vanderbilt Orchestra.
  8:10 p. m.—Scores and racing results.
  8:10 p. m.—Musicale.
  9 p. m.—Zoological Society series.
  10 p. m.—"Over the Seven Seas."
  11 p. m.—Mayflower Orchestra.
  WIY—NEW YORK CITY.
- WJY-NEW YORK CITY-405 30 p. m.—Ambassador Trio. 30 p. m.—The Texans, songs. 15 p. m.—Sport talk, 30 p. m.—Marcia Schupac program. 9:30 p. m.—Marcia Schupac program,
  WEAF—NEW YORK CITY—492
  6:45-7:45 a. m.—Health exercises.
  11 a. m.—Adolph Opfinger, planist.
  11:10 a. m.—Lecture; plano.
  11:35 a. m.—"Motion Picture Forecast"
- (noon)—Market and weather reports. 12 (noon)—Market and weather reports.
  4 p. m.—Frances May, violiniste.
  4:10 p. m.—'Women's Program"; talk;
  4:30 p. m.—'Women's Program"; talk;
  Max Weiser, violinist.
  6 p. m.—Dinner msic.
  7 p. m.—Charles Bethman, barytone.
  7:10 p. m.—Columbia University lecture.
  7:30 p. m.—Barytone and plano solos.
  8 p. m.—'Financial Events," Dudley
  Fowler.
- Fowler.
  8:10 p. m.—Ross Gorman's Orchestra.
  8:30 p. m.—"The Twins."
  9 p. m.—"Eveready Hour."
  10 p. m.—Operatic concert.
  11-12 p. m.—Vincent Lopez's Orchestra.
- 11-12 p. m.—Vincent Lopez's Orchestra.

  WGBS—NEW YORK CITY—316

  10 a. m.—Timely talks with Terese.
  10:10 a. m.—Agnes Moes, soprano.
  10:20 a. m.—Household talk; songs.
  10:40 a. m.—"Home Economics"; songs.
  1:30 p. m.—Scripture reading.
  1:35 p. m.—Blossom Heath Serenaders.
  3 p. m.—Furniture talk.
  3:10 p. m.—Rosalle Blanchard, Walter
  Croft, duets.
  3:20 p. m.—Dancing lessons.
  3:30 p. m.—Duets.
  3:40 p. m.—Plano lessons. p. m.—Duets.

  do p. m.—Piano lessons; duets.

  p. m.—Uncle Geebee.
- 6:30 p. m.—Concert and dance orchestra.
  7 p. m.—Arrowhead Concert Orchestra.
  8 p. m.—Gallico's "Synthetic Fights"
  8:20 p. m.—Ralph de Wolfe, tenor; Lillian
  Jesso, soprano. Jesso. soprano.

  9 p. m.—Lovat Pipe Band.

  10 p. m.—Rose Karasik, soprano.

  10:10 p. m.—Jacob Forstat, cello.

  10:20 p. m.—Rose Karasik, soprano.

  10:30 p. m.—Arrowhead Dance Orchest

  11:30 p. m.—Interview with George Je 0:30 a. m.—Radio chats: market 2 noon-2 p. m.—Luncheon music.
- 30 p. m.—Arrowhead Dance Orchestra.
  30 p. m.—Interview with George Jessel.
  WHN—NEW YORK CITY—361
  2:30 p. m.—Marsh McCurdy, organist.
  115 p. m.—Overture and vaudeville.
  115 p. m.—Lexington Theater Orchestra.
  130 p. m.—Goodman and Geller, songs.
  p. m.—Children's hour.
  180 p. m.—Oakland's Chatheau Shanley.
  p. m.—Talk, Garland Anderson.
  19 p. m.—Bernard Share, violinist.
  19 p. m.—Leslie McLeed, tenor.
  19 p. m.—Violin, 'cello and piano.
  10 p. m.—Philip Krumholtz, barytone.
  10 p. m.—Philip Krumholtz, barytone.
  10 p. m.—William West's Orchestra.
  10 midnight—Kentucky Orchestra.
  10 WMCA—NEW YORK CITY—341 12 noon-2 p. m.—Luncheon music,
  5:15 p. m.—Story teller; scores,
  5 p. m.—Ross Gorman's Orchestra,
  8:30-11 p. m.—Program same as WEA
  WRC—WASHINGTON—469
  10 a. m.—Women's hour, from WJZ,
  1 p. m.—Organ recital,
  2 p. m.—Mayflower Orchestra,
  8:30 p. m.—Shoreham Orchestra,
  9:30 p. m.—Musical program,
  11 p. m.—Tupman's Orchestra,
  - 11 p. m.—Tupman's Orchestra.

    KDKA—PITTSBURGH—309
    3:30-7 p. m.—Scores (half hourly).
    9:45 p. m.—Dormont Ladies' Tri
    Anne McCurdy, contralto.
    11:30 p. m.—Concert.

Time Wave P. M. Station. Length Orchestra

MONDAY, SEPTEMBER 21

TUESDAY, SEPTEMBER 22

8:00 WMCA \$41 Lanson's

361 Roseland
233 Colonial
300 Steeplechase
252 Strickland's
395 Dance music
492 Ben Bernie's
455 J. Knecht's
341 Messner
508 Dance music
319 Vincent Lops
333 Brunswick
361 Ted Lewis's

10:15 WGCP 252 Polla's 10:45 WHN 361 Janssen's

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#### WEDNESDAY

- WEAF—NEW YORK CITY—492
  6:45-7:45 a. m.—Health exercises.
  10:45 a. m.—Home service talk; music.
  11:05 a. m.—Joseph Bier, barytone.
  11:30 a; m.—'Health Talk'; songs.
  12 noon—Market and weather reports.
  4 p. m.—Sadrian String Trio.
  4:45 p. m.—''A Trip to Amsterdam.''
  6 p. m.—Dinner music.
  7 p. m.—Synagogue services.
  7:30 p. m.—United States Army Band.
  8 p. m.—The Buddes.
- 10:30 p. m.—Police alarms; weather.

  WFBH—NEW YORK CITY—273
  2-3:45 p. m.—Studio program.
  3:45 p. m.—Francine Vyde, soprano.
  4 p. m.—Baseball scores (quarter hourly).
  4:05 p. m.—Richard Hitter's Orchestra.
  p. m.—Leo Ford's Entertainers.
  6:15 p. m.—Basesert Lumberjacks.

  WOKO—NEW YORK CITY—233
  8:30:11 p. m.—Bive races: Joe Basile's WAHG-RICHMOND HILL, N. Y.-316 WOR—NEWARK—405 :15-7:15-7:45 a. m —Gym class. WJZ-NEW YORK CITY-455
- 6:17 p. m.—"Words Mispronounced." 6:17 p. m.—"Sports," Bill Wathey. 6:30 p. m.—"Man in the Moon Stories." 7 p. m.—Shelton Ensemble. WGCP-NEWARK-405 WAAM—NEWARK—263
  m.—Happy Hour; Cooking S
  n.—Joe Brown, tenor.
  m.—Alice Evans, talk. p. m.—Pearl Ryno, soprano,
  p. m.—Paragon Orchestra.
  p. m.—W. M. Emery, barytone, m.—Marinello program,
  p. m.—W. M. Emery, barytone,
  p. m.—Transcontinental Tour,
  m.—Jimmy Shearer, songs.
- WFI-PHILADELPHIA-395 p. m.—Orchestra,
  p. m.—Talk,
  3:45 p. m.—Fashion feature,
  4 p. m.—Jack Young's Orchestra,
  5:45 p. m.—Ross Gorman's Orchestra
  8 p. m.—Ross Gorman's Orchestra WLIT—PHILADELPHIA—395 p. m.—Jimmy Jones's Orche

2:45-6 p. m.

WNYC-NEW YORK CITY-526 m.-Market high spots.

- WLIT—PHILADELY 12:30 p. m.—Jimmy Jones's Orches broadcast.
  2-3 p. m.—Concert orchestra; recital.
  4:30 p. m.—Artist recital.
  7:30 p. m.—Dream Daddy.
  7:50 p. m.—Plays and players. WIP-PHILADELPHIA-508
- WIP—PHILADELPHIA—508

  a. m.—Setting-up exercises.
  a. m.—Organ recital.
  m.—Artist recital.
  p. m.—Dinner music.
  m.—Roll call; birthday list.
  m.—Elliott Lester, critic of WIP.
  p. m.—Thoms Strausback Austin Trio.
  0:05 p. m.—"Emo's Movie Broadcast."
  0:30 p. m.—Talk on calico printing.
  0:45 p. m.—Pagoda Orchestra.
  WCAU—PHILADELPHIA—278
- 130 p. m.—Harry Link,
  10:30 p. m.—Billy Hayes's Band,
  WOO—PHILADELPHIA—508

  11 a. m.—Grand organ,
  12 (noon)—Luncheon music,
  14:45 p. m.—Grand organ; trumpets,
  7:30 p. m.—Dinner music.
- WPG-ATLANTIC CITY-300 WPG-ATLANTIC CITY-300

  1:30 p. m.—Luncheon music.
  6:40 p. m.—Baseballs scores; organ recital
  7 p. m.—Dinner music.
  8:05 p. m.—Operalogue "Faust," artists.
  9 p. m.—Ambassador Concert Orchestra.
- p. m.—Organ recital; vocal solos.
  WHAK—ATLANTIC CITY—275 :15 p. m.—Strand organ recital. WGY—SCHENECTAIY—380 p. m.—Music; one-act play.
  10 p. m.—Dinner program.
  15 p. m.—Ollie Yettru, planist.
  16 p. m.—Popular melodies.
  17 p. m.—Popular melodies.
  18 p. m.—Mayflower Orchestra.
  18 p. m.—Mayflower Orchestra.
  18 p. m.—Musical program.
- 9:05 p. m.—Musical program. 10:05 p. m.—Concert. 10:30 p. m.—Orfole Orchestra. WGR—BUFFALO, N. Y.—319 p. m.—Program same as WEAF, WTIC—HARTFORD, CONN.—476
- wJAR—PROVIDENCE—306
- WJAR—PROVIDENCE—306

  1:05 p. m.—Biltmore Orchestra.
  7:35 p. m.—Wask Tawkalog."

  8 p. m.—Safety talk.

  8:10 p. m.—Walter Barry, tenor,

  8:30 p. m.—The Twins.

  9 p. m.—Eveready Hour.

  10 p. m.—Dance orchestra.

  WEEI—BOSTON—349

  6:30 p. m.—Big Brother Club.

  7:20 p. m.—Lost and found; scores.

  7:30 p. m.—Walscale.

  8-11 p. m.—Program same as WEAF.

  WBZ—SPRINGFIELD, MASS.—333

  7 p. m.—Leo Reisman's Ensemble.
- 9 p. m.—Concert by artists. 9 p. m.—Concert by artists. 9:30 p. m.—Alandale Art Studios hour. 10 p. m.—Market survey; scores; time. WCTS—WORCESTER, MASS.—268

Daylight Saving Time

- WGBS-NEW YORK CITY-316
- 3-4 p. m.—Beethoven program; Helen Heartwell, soprano. 6 p. m.—Uncle Geebee. 6:30 p. m.—Yerkes's Orchestra. 7 p. m.—Norbert Lusk, "Movie Sidelights 6:30 p. m.—Yerkes's Orchestra.
- WHN-NEW YORK CITY-361 2:15 p. m.—Ivy La Skere, vocalist. 2:30 p. m.—Lou Fordon Billy Matheb
- 4:25 p. m.—Silvio Dirienzo, pianist,
  4:40 p. m.—Julia Martin, soprano.
  4:50 p. m.—Yama Yama Boys." songs.
  5 p. m.—Children's hour.
  7:30 p. m.—Frances O'Connor, songs.
  7:45 p. m.—Rose Baiglan, pianist,
  8 p. m.—C. Little, barytone.
  8:15 p. m.—Judith Roth, soprano.
  8:30 p. m.—Rabbi H. S. Goldstein.
  8:35 p. m.—Cantor Hopkins.
  8:45 p. m.—J. A. Trott, mandolin
  9 p. m.—Emmerson Rugor songs.
  9:15 p. m.—Martin Walsh, singing.
  9:30 p. m.—Martin Walsh, singing.
  9:30 p. m.—Roseland Dance Orchestra.
  11 p. m.—Silver Silpper Revue.
  11:30 p. m.—Ted Lewis's Orchestra.

  WMCA—NEW YORK CITY.
  3:11
- WMCA-NEW YORK CITY-341
- 11:15 a. m.—'Radiograds of Fashion Fads."

  11:30 a. m.—Helen A. Morris, soprano.
  11:45 a. m.—Snedden Weir, barytone.
  12 m.—Olcott Vail's String Ensemble.
  12:30 p. m.—Women's Arts Exposition Luncheon.
  3 p. m.—Women's Arts Exposition.
  6 p. m.—Olcott Vail's String Ensemble.
  6:30 p. m.—Ernie Golden's Orchestra.
  7:30 p. m.—Fred Ruzika, violinist.
  7:45 p. m.—George Flanders, planist.
  8 p. m.—Women's Arts Exposition.
  8:30 p. m.—Theo Alban, tenor.
  - WRNY-NEW YORK CITY-259
- 12:02 p. m.—Trio, 1 p. m.—Radio Industry Hour. 1 p. m.—Radio Industry Hous.
  1:02 p. m.—Sports forecast.
  1:30 p. m.—Edith Spieler, pianist.
  1:45 p. m.—Bernard, "Timeology."
  7 p. m.—Whose Birthday To-day?"
  7:05 p. m.—High Spots in Sports.
  7:10 p. m.—Commerce of the Day.
  7:20 p. m.—Code Lesson.
  7:35 p. m.—"New Inventions."
  —"American Composers." -Dr. Spaeth's Artists.
- 8 p. m.—Dr. Spaeth's Artists.
  8:30 p. m.—Fiction series.
  8:45 p. m.—Samuel Polansky, violinist.
  9 p. m.—Tips to Radio Constructors."
  9:15 p. m.—Architect series.
  9:20 p. m.—Wood Wind Concert.
  9:20 p. m.—Avaidton series. tet. 10:30 p. m.—Biography series.
- 6 p. m.—Elementary Spanish lessons.
  6:30 p. m.—Advanced Spanish lessons.
  7 p. m.—Market high spots.
  7:10 p. m.—Block's Orchestra.
  7:30 p. m.—Police alarms. p. m.—Block's Orchestra; scores.
  p. m.—Evelyn Chorosh, violinist.
  p. m.—Claire Higgins, pianist.
  p. m.—R. L. Gilliam, barytone.
- ist. 9:40 p. m.—Bessie Simon, violinist. 10:05 p. m.—Martha Weiss, pianist. 10:30 p. m.—Police alarms; weather WAHG-RICHMOND HILL, N. Y.-316 12:30 p. m.—Almon and Bower, violin. 7:30 p. m.—Thornton Fisher, "Sports." 7:45 p. m.—Gerlich and Cornish, saxo
- 7:45 p. m.—Gerlich and Cornish, sa phone.

  8 p. m.—Alonzo and Pantano Trio.

  8:15 p. m.—Evan Davies, barytone.

  8:45 p. m.—Saxophone and plano.

  8:30 p. m.—Joe Zimmerman, planist.

  9 p. m.—Alonzo and Pantano.

  9:35 p. m.—Evan Davies, barytone.

  9:30 p. m.—Joe Zimmerman, planist.

  10:45 p. m.—Herman Fisher, readings.

  10:15 p. m.—Zimmerman's Orchestra.

  11:05 p. m.—Zimmerman's Orchestra.

WEDNESDAY, SEPTEMBER 23

WGCP WEBJ WTIC WEBJ WLIT WGCP WAHG WJZ WOO WEAF WGR WAHG

WEBJ-NEW YORK CITY-273

p. m.—Eddie Burke.
p. m.—Henryetta Turner, ukulele.
p. m.—Eddie Burke, Irish piper.
p. m.—McLean's Dance Orchestra

WFBH-NEW YORK CITY-273

WGCP-NEWARK-252

WFI-PHILADELPHIA-395

6:45 p. m.—Roof garden broadcast. WLIT—PHILADELPHIA—395

-Organ recital WIP-PHILADELPHIA-508

- WEAF-NEW YORK CITY-492
- 7:30 p. m.—United States Army Band.

  8 p. m.—The Buddies.

  8:30 p. m.—"Pooley Period."

  9 p. m.—"Waterman's Points of Progress.

  10 p m.—"Ipana Troubadours."

  11-12 p. m.—Ben Bernie's Orchestra. 7:15 p. m.—Cole & Wood, pianists.

  WOR—NEWARK—405
  6:15-7:15-7:45 p. m.—Gym class.
  2:30 p. m.—Mario Alvarez, tenor.
  2:45 p. m.—Talk, Earl Rossman, explorer.
  3 p. m.—Mario Alvarez, tenor.
  3:15 p. m.—Words Mispronounced."
  6:17 p. m.—'Words Mispronounced."
  6:17 p. m.—'Shelton Ensemble.
  7:30 p. m.—'Words Mispronounced."
  6:17 p. m.—Shelton Ensemble.
  7:30 p. m.—Vincent Lopez's Orchestra.
  8 p. m.—'Topics of the Day."
  8:15 p. m.—Carmen Concert Trio.
  9 p. m.—Melody Four.
  9:15 p. m.—Grace Divine, soprano.
  9:30 p. m.—'Selecting a Career," F. Wadsworth.
- WJZ—NEW YORK CITY—455

  10 a. m.—Women's hour.

  1:15 p. m.—Irwin Abrams's Orchestra.

  2, 4, 5:30, 8 and 10:30 p. m.—News.

  4-6 p. m.—Scores; racing (half-hourly).

  5:26 p. m.—Market reports.

  5:30 p. m.—Financial summary.

  8 p. m.—Scores and racing results.

  8:30 p. m.—N. Y. Edison Hour.

  9:30 p. m.—N. Y. Edison Hour.

  9:30 p. m.—Weyer Davis's Orchestra.
- worth.

  9:45 p. m.—Melody Four.

  10 p. m.—Grace Divine, soprano.

  10:15 p. m.—Talk, Sullivan Jones.

  10:30 p. m.—Clarence Williams's Trio.

  11 p. m.—Mana-Zuca, composer; Vladimir Graffman, violinist, and others; Flanched 10 a. m.—Timely talks with Terese.
  10:10 a. m.—Gertrude Verney, soprano.
  10:20 a. m.—Beauty talk; soprano.
  10:40 a. m.—'Furniture Talk'; songs.
  1:30 p. m.—Scripture reading.
  1:35 p. m.—Robert Murray, planist.
  1:40 p. m.—Strand Roof Orchestra.
- Graffman, violinist, a Richardson's Orchestra. :45 p. m.—Songs; race results, :45 p. m.—Clarence Williams's Trio, :15 p. m.—Bob Ward's Little Wards, 4:15 p. m.—Bob Ward's Little Wards.
  4:30 p. m.—Songs.
  8 p. m.—Ukulele Lou Hayes.
  8:15 p. m.—Thomas Waller, Roy Banks,
  Andy Razaf.
  8:30 p. m.—Dick and Flo Bernard.
  8:45 p. m.—Marcel Doublier, saxophonist.
  9 p. m.—William J. Rietz, original songs.
  9:15 p. m.—Indianans' Orchestra.
  10 p. m.—Sam Williams, Al Piantodosi.
  10:15 p. m.—Dance orchestra.
- songs.

  145 p. m.—White's Entertainers.

  145 p. m.—Jimmy Clarke's Entertainers.

  145 p. m.—Mae Gooderson "Poems."

  4:25 p. m.—Sivio Dirienzo, planist.

  14:25 p. m.—Sivio Dirienzo, sonrano. 10:15 p. m.—Dance orchestra.

  WAAM—NEWARK—263

  11 a. m.—Happy Hour.
  7 p. m.—Nippes's Orchestra; sport oracle
  8:10 p. m.—Mrs. Bataille, soprano.
  8:30 p. m.—Joe Furtner, zither.
  8 p. m.—Geiger's Dance Orchestra.
  9:30 p. m.—Finding Youth."
  9:45 p. m.—Geiger's Orchestra.
  10:10—John Stein, violinist.
  10:25 p. m.—Soprano and violin solos.
- 1 a. m.—Helen Morris, soprano. 1:15 a. m.—"Radiograds of Fashi
  - m.—Setting-up exerced.—Luncheon music.—Artist recital. m.—Bedtime story. WCAU—PHILADELPHIA—278 8 p. m.—Lyric Trio. 9 p. m.—Charles Gilpin, songs.
    - 7:30 p. m.—Dinner music.
      8 p. m.—United States Army Band.
      8:30 p. m.—'Pooley Period."
      9 p. m.—'Waterman's Points of Progress.'
      10 p. m.—'Your Hour,"
      11 p. m.—Dance music.
      WGY—SCHENECTADY—380
    - 6:30 p. m.—Program for children. 6:45 p. m.—Strand Theater Orchestra. 7:35 p. m.—"Book of Knowledge." WRW—TARRYTOWN, N. Y.—273 10:10 p. m.—Nicolas Koenig's Orchestra 10:30 p. m.—Gordon MacMunn, songs. 11:05 p. m.—Nicolas Koenig's Orchestra WGR—BUFFALO, N. Y.—319 6:30-7:30 p. m.—Two-piano recital. 8:30 p. m.—Jack Little, songs. 9 p. m.—"Waterman's Points of Progress." 10 p. m.—Ipana Troubadours. 11 p. m.-1 a. m.—Dance music WTIC—HARTFORD, CONN.—476
    - w. —Dance music. WJAR—PROVIDENCE—306 WJAK—PROVIDENCE—306

      10 a. m.—Housewives' Exchange.

      12:20 p. m.—Safety program.

      1:05 p. m.—Studio program.

      7:30-0 p. m.—U. S. Army Band.

      9-10 p. m.—Waterman's Points of Progress 10 p. m.—"Your Hour."
      WEEI—BOSTON—349
    - 30 p. m.—C. B. Collins, so. 3 p. m.—Musicale, 3:30 p. m.—Earl Nelson, uke. 9 p. m.—Musical program. p. m.—Ipana Troubadours. WBZ—SPRINGFIELD, MASS.—333
    - WBZ—SPRINGFIELD, MASS.—333
      7 p. m.—Dinner concert,
      7:32 p. m.—Radio nature story.
      9 p. m.—Mrs. Helen Ryan, contrait,
      Dorothy Curtis, planist; Elmer Curti
      trumpeter; Albert Heer, barytone,
      10 p. m.—Brunswick Orchestra,
      10:30 p. m.—Market report,
      10:40 p. m.—Civil Service examinations,
      10:50 p. m.—Baseball scores; time,
      WCTS—WORCESTER, MASS.—268
      10:30 a. m.—Radio chat; music. .—Concert. WRC—WASHINGTON—469 10 a. m.—Women's Hour, from 1 p. m.—Organ recital.
      2 p. m.—Washington Orchestra.

THURSDAY, SEPTEMBER 24

FRIDAY, SEPTEMBER 25

Keenig's Dance music Ted Lewis's

Shoreham
Dance music
Royal
Steeplechase
Dance music
Emic Golden's
Swanee
Vincent Lopes
Jacques Green's
Ted Lewis's

Copley Plaza
Dance music
Strickland's
Virginians
Dance music

p. m.—U. S. Army Band, m.—The Foremost Four. p. m.—U. S. Army Band, n.—"Waterman's Points of Program.—Ipana Troubadours. p. m.—Dance program. KDKA—PITTSBURGH—309 3:30-7 p. m.—Scores (half hourly). 9:45 p. m.—Hour of Music.

### THURSDAY

- WJZ-NEW YORK CITY-455 WIZ-NEW YORK CITY-455

  10 a. m.—Women's program.

  11:05 a. m.—Book review.

  2. 4. 5:20, 8 and 11 p. m.—News.

  4-6 p. m.—Scores; results; (half hourly).

  5:26 p. m.—Market reports.

  5:30 p. m.—Financial summary.

  7:15 p. m.—Vanderbilt Orchestra.

  7:55 p. m.—"The Northwest Mounted."

  8 p. m.—Scores; racing results.

  8:30 p. m.—United States Army Band.

  10 p. m.—Royal Hour of Music.

  11:05 p. m.—Jacques Green's Orchestra;

  Clark's Hawaiians.

  WIZ-NEW YORK CITY-405
- WJY—NEW YORK CITY—405
  (30 p. m.—Freddie Rich's Orchestra.
  (315 p. m.—"International Polo."
  (32) p. m.—Violino Virtuoso Concert. S:30 p. m.—Violino Virtuoso Concert.

  WEAF—NEW YORK CITY—492
  6:45-7:45 a. m.—Health Exercises.
  11-12 a. m.—Housewives' Hour; May
  Breen, Peter de Rose; speakers.
  12 noon—Market and weather reports.
  4 p. m.—Roy Nichols's Orchestra.
  4:45 p. m.—Talk by Cameron Rogers.
  6 p. m.—Dinner music.
  7 p. m.—Mid-week services; Aida Brass
  Quartet; address by Rev. D. J. Fant.
  1:30 p. m.—'Pop' concert.
- 3.50 p. m.—Serenaders, 3.50 p. m.—'Pop' concert, 3.30 p. m.—'Touring,' George Cooley, 0.50 p. m.—Radio artists, 10 p. m.—Silvertown Orchestra, 11-12 p. m.—Vincent Lopez's Orchestra, 11-12 p. m.—Vincent Lopez's Orchestra,
- WGBS-NEW YORK CITY-316 0 a. m.—Timely talks with Terese.
  0:10 a. m.—Juanita Stewart, sopra
  Don Clark.
  30 p. m.—Scripture reading.
  135 p. m.—Blanche Russell, soprano.
  135 p. m.—Woman in the Home" hour.
  136 p. m.—Uncle Gebee.
  137 p. m.—Voltaire hour of music.
  138 p. m.—Boys' Club hour.
  139 p. m.—Boys' Club hour.
  130 p. m.—Mme. Frances Roeder,
  130 p. m.—Mme. m.—Timely talks with Terese, a. m.—Juanita Stewart, soprar of Clark.
- prano. 9 p. m.—Andradet Lindsey, planist. 9:30 p. m.—King Barry, Michael s guitar, 10:30 p. m.—To be announced. WRNY-NEW YORK CITY-259
  12:02 p. m.—Trio.
  1 p. m.—Radio industry.
- 1 p. m.—Radio industry.
  1:02 p. m.—Sports forecast.
  1:05 p. m.—Sports forecast.
  1:05 p. m.—Roger Kahn's Orchestra.
  7 p. m.—'Whose Birthday To-day?''
  7:05 p. m.—Sports results.
  7:10 p. m.—Chef Chetaux chats.
  7:20 p. m.—Chef Chetaux chats.
  7:30 p. m.—Rita's music party.
  7:45 p. m.—'The Ballad Minstrel.''
  8 p. m.—Orlando Concert Orchestra.
  8:15 p. m.—'Violin Series.''
  8:30 p. m.—Radio questions and ans
  8:45 p. m.—Songs. Ralph Heyman. questions and ans Ralph Heyman.
- 10 p. m.—Esperanto lesson.
  10:20 p. m.—Volga Trio.
  10:50 p. m.—California Orchestra.
  11:15 p. m.—"Zingerella," cast and chorus.
- WHN—NEW YORK CITY—361

  12:30 p. m.—Marsh McCurdy, organist.
  3:15 p. m.—Lexington Theater Orchestra.
  4:30 p. m.—Bob Miller, Lewis Plotti.
  5 p. m.—Children's hour, Betty Healy,
  7:30 p. m.—Geil Kennedy, barytone.
  7:45 p. m.—Jasha Kritchevsky, violinist.
  8 p. m.—Oakland's Chateau Shanley.
  8:30 p. m.—Ethel West, soprano.
  8:45 p. m.—Fitzpatrick Brothers, songs.
  9 p. m.—Jirpatrick Brothers, songs.
  9 p. m.—Jirpatrick Brothers, songs.
  9 p. m.—Jirchestra Brothers,
  10:30 p. m.—Victor Herbert program.
  10:45 p. m.—Jack Smith, barytone.
  10 p. m.—Vaudeville headliners.
  10:30 p. m.—Orchestra and revue.
  11 p. m.—Swanee Orchestra.
  11:30 p. m.—Ted Lewis's Orchestra.

  WNYC—NEW YORK CITY—526 WHN-NEW YORK CITY-361
- WNYC-NEW YORK CITY-526 . m.—Market high spots. 0 p. m.—Arcady Orchestra; s. -"Baseball," Frederick Lieb.
- tenor.
  9:30 p. m.—Bessie Lepson, planist.
  9:45 p. m.—Harry Needle, violinist.
  10 p. m.—Bessie Lepson, planist.
  10:15 p. m.—Harry Needle, violinist.
  10:30 p. m.—Police alarms; weather.
- WMCA—New YORK CITY—341

  11 a. m.—Anne Ritz, soprano.

  11:15 a. m.—Bernice Bowser, "Lampa,"

  11:30 a. m.—Henry Rogers, planist.

  11:45 a. m.—Anne Ritz, soprano.

  12 noon—Olcott Vall's String Ensemble.

  12:30 p. m.—Women's Arts Expositi
- 3 p. m.—Women's Arts Exposition.
  6 p. m.—Olocit Vail's String Ensemble.
  6:30 p. m.—Musical program.
  7:30 p. m.—Lanson's Orchestra.
  8:15 p. m.—Women's Arts Exposition.
  9 p. m.—Symphony orchestra.
  10 p. m.—Eve Darlon, soprano.
  10:15 p. m.—Women's Arts Exposition.
  11 p. m.—Ernie Golden's Orchestra.
  WOKO—NEW YORK CITY—233
  8 p. m.—Shirley Herman, singer.
- WORO—NEW YURK CITI—600 p. m.—Shirley Herman, singer. 15 p. m.—Martin Walsh, barytone. 35 p. m.—Beatrice Pollak, recitations. 50 p. m.—Ethel Ellman, soprano. 05 p. m.—Billy Ihlefeld's Amphions. WBBR—STATEN ISLAND, N. Y.—273 p. m.—Instrumental trio. :10 p. m.—Stanley Gohlinghorst, bary-

8:20 p. m.—Sunday School lesson.

SATURDAY, EEPTEMBER 26

| 10:05 WTIC | 476 | 10:15-12 WAHG | 816 | 10:30 WHN | 861 | 10:30 WJZ | 455 | 10:30 WOO 508 | 11:00 WEAF | 492 | 11:00 WRNY 258 | 11:1 WCAP | 469 | 11:30 WHN | 861 |

WRC
WMAF
WOR
WIP
WJZ
WGBS
WEAF
WMCA
WRW
WRC
WRNY

:40 p. m.—Songs; Trio, WAHG—RICHMOND HILL, N. Y.—316 2:30 p. m.—Musical program.

Dance musio F, Laria's Roseland Ben Glaser's Dance musio Dance musio Unger's Dance musio Alabam

Washington
Bob Rickett's
Slater's
Dance music
J. Knecht's
Arrowhoad
Vincent Lopez
Ernic Golden's
Dance music
Crandall's
Ferrucci's
Bensonians

- p. m.—Orchestra. p. m.—Knickerbocker Hospital talk.
- 5 p. m.—Knickerbocker Hospital talk. i:15 p. m.—Songs. i:15 p. m.—Songs. f. p. m.—Issay Lukeshevsky, violinist. i:30 p. m.—Jack Smith. songs. WOR—NEWARK—405 6:45-7:15-7:45 a. m.—Gym class. 2:30 p. m.—Jean Kayaloff, celist. 2:45 p. m.—Dr. Geo. Little, "The Pers. Cat." Cat."

  3 p. m.—Dick and Flo Bernard, songs.

  3:15 p. m.—Jean Kayaloff, cellist.

  3:30 p. m.—Eugene Spier, pianist.

  3:45 p. m.—Dick and Flo Bernard, sor

  6:15 p. m.—"Words Mispronounced."

  6:17 p. m.—Shelton Ensemble.

  7:15 p. m.—"Sports." Bill Wathey.

  WGCP—NEWARK—405

  9:45 p. m.—Songs: race results (
- 2:45 p. m.—Songs; race results hourly).
- nourly),
   p. m.—Collegians' Orchestra.
   p. m.—Theo Alban, tenor; Jane
   p. m.—Sidney Basha's Orchest
   WAAM—NEWARK—263
- m.—Dance music. WFI—PHILADELPHIA—395 10:30 a. m.—Solos.

  1 p. m.—Tea Room Orchestra,

  3 p. m.—Colored artists.
- p. m.—Fashion feature. p. m.—Roof garden, broadcas 11 p. m.—Program same as WEAF, WLIT—PHILADELPHIA—395
- p. m.—Sesqui-Centennial Hour. WOO—PHILADELPHIA—508
- WPG—ATLANTIC CITY—300 WPG—ATLANTIC CIT I—300
  1:30 p. m.—Luncheon music.
  4:30 p. m.—Tea music.
  6:30 p. m.—"Billy" Rocap, "Sporta"
  7 p. m.—Dinner music.
  8:15 p. m.—Organ recital.
  9:15 p. m.—Concert orchestra.
- 10:15 p. m.—Steep!echase Orchestra-WHAR—ATLANTIC CITY—275 p. m.—Seaside Trio. :30 p. m.—Lecture period. m.—Seaside Trio. WGY—SCHENECTADY—380
- 2 p. m.—Music: talk.
  2:30 p. m.—Organ recital.
  6:30 p. m.—Dinner program.
  7:35 p. m.—'WGY Book Chat.''
  7:45 p. m.—WGY Orchestra.
  8:30 p. m.—United States Army Band.
  9:40 p. m.—Albert West, songs.
  10 p. m.—Royal Hour. 10 p. m.—Royal Hour. 11:30 p. m.—Organ recital. WRW—TARRYTOWN—273
- WRW—TARRYTOWN—278
  9:05 p. m.—Uke Trio, scores.
  9:40 p. m.—Albert West, songs.
  10:05 p. m.—WRW Euke Trio.
  10:15 p. m.—Royal Orchestra.
  11:05 p. m.—Royal Orchestra.
  WGR—BUFFALO—319 WIWL—NEW YORK CITY—288
  8:30 p. m.—Opening of station. Address
  by Cardinal Hayes; Metropolitan Opera
  6:30 p. m.—Program same as WEAF.
  WTIC—HARTFORD, CONN.—476
  - WJAR—PROVIDENCE—306 p. m.—Radio Artists.

    0 p. m.—Silvertown Orchestra.

    WEEL—BOSTON—349

    1 p. m.—Joe Herman's Orchestra.

    3:30 p. m.—Big Brother Club.

    1:20 p. m.—Lost and found; scores.

    1:30 p. m.—George Sykes, tenor.

    3-11 p. m.—Program same as WEAF.

    WBZ—SPRINGFIELD, MASS.—333

    7 p. m.—Lenox Ensemble.
  - m.—Lenox Ensemble.
    m.—McEnelly's Singing Orchestra.
    p. m.—Percy Appleby, tenor.
    m.—Harold Crumrine, flutist.

  - 1 p. m.—Meyer Davis's Band, KDKA—PITTSBURGH—308 3:30-7 p. m.—Scores (half hourly), 9:45 p. m.—KDKA Symphony Players, 11:15 p. m.—Concert.

- FRIDAY WEAF—NEW YORK CITY—492 6:45-7:45 a. m.—Health exercises, 10:45 a. m.—Home service talks, 11:05 a. m.—Thomas Hughes, pianist, 11:35 a. m.—"Every One Can Sing"
- piano.

  12 noon—Market and weather reports.

  4 p. m.—Minnie Weil, pianist.

  4:10 p. m.—Hazel Dudley, soprano.

  4:25 p. m.—Winnie Weil, pianist.

  4:45 p. m.—"The Dreadful Shark."

  6 p. m.—Dinner music.

  7 p. m.—Gene Ingrahm's Orchestra.

  7:30 p. m.—Story teller.

  7:45 p. m.—Dorothy Currey, pianist.

  8 p. m.—The Happiness Boys.

  8:30 p. m.—Trio.
- p. m.—The Happiness Boys.

  30 p. m.—Trio.
  p. m.—Entertainers.
  p. m.—Gordon Male Quartet.
  0.15 p. m.—Gordon Male Quartet.
  0.30 p. m.—Gordon Male Quartet.
  0.45 p. m.—Bill Groen, dulcimer player
  2 midnight—Dance orchestra.

  WJZ—NEW YORK CITY—455
  0 m.—Women's hour.
- 10 a. m.—Women's hour.
  1 p. m.—Ambassador Trio.
  2, 4, 5:20, 8 and 10:30 p. m.—News.
  4-6 p. m.—Scores, racing (half-hourly).
  4:05 p. m.—Violino virtuoso concert.
  5:26 p. m.—Market reports.
  5:50 p. m.—Financial summary.
  6:01 p. m.—Baseball; racing returns.
  7 p. m.—Lafayette Orchestra.
  8 p. m.—Scores and racing returns. 3 p. m.—Scores and racing returns. 10 p. m.—Keith McLeod, pianist. 130 p. m.—Colgate program. 130 p. m.—United States Navy night. 130 p. m.—Ben Glaser's Orchestra. WJY—NEW YORK CITY—405

  D. m.—Irwin Abrams's Orchestra

  D. m.—Monte Carlo Virginians.
- WRNY—NEW YORK ORTY—259
  12:02 p. m.—Trio.
  1 p. m.—Radio industry hour.
  1:02 p. m.—Sporth forecast.
  1:10 p. m.—Jaeger's Gypry Music.
  1:20 p. m.—Studio feature. 1:20 p. m.—Studio feature,
  1:45 p. m.—Jaeger's Gypsy Music,
  7 p. m.—High spots in sports,
  7:05 p. m.—Dr. Isaac Landman, talk,
  7:15 p. m.—Whose Birthday To-day?
  7:20 p. m.—Commerce of the day.
  7:25 p. m.—Code lesson,
  7:45 p. m.—Studio concert,
  8 p. m.—Grand opera,
  8 p. m.—Grand opera,
  9 p. m.—"Radio Theory vs. Practice."
  1:50 p. m.—Boy Scout Band,
  1:50 p. m.—Grand opera,
  1:50

- WFBH—NEW YORK CITY—273
  2 p. m.—Orchestra.
  3 p. m.—Studio program.
  3:30 p. m.—Radioviews, Mrs. Owen Kildare.
  4 p. m.—Orchestra.
  4:05 p. m.—Baseball scores (quarter)
  4:05 p. m.—Inez Quick, soprano; Helen
  - . m.—Interview with George Zolla.

    ) p. m.—Charlotte Cortina, soprano.

    0 p. m.—The Hon. E. T. Merideth.

    0 p. m.—Charlotte Cortina, soprano.

    1 p. m.—Uncle Geebee.

    1 p. m.—Jule Anzel's Orchestra.
    - p. m.—Uncle Geebee. :30 p. m.—Jule Anzel's Orchestra. p. m.—"What's Your Radlo Problem?" :10 p. m.—Jule Anzel's Orchestra. WNYC-NEW YORK CITY-526 p. m.—Elementary French lesson op. m.—Advanced French lessons. m.—Market high spots.
    - 6 p. m.—Elementary French lessons.
      6:30 p. m.—Market high spots.
      7:10 p. m.—Chateau Four; police alarms.
      8:05 p. m.—Cy Bryce Little, barytone; Joseph Wollmann, pianist.
      9:15 p. m.—Lawrence Metcalf, whistle; Sef Wohlmann, pianist.
      9:15 p. m.—Lawrence Metcalf, whistle; Francesca Cataline, soprano; Eumenio Blanco, tenor.
      10 p. m.—Rudolph Joskowitz, violinist.
      10:30 p. m.—Police alarms; weather.
      WHN—NEW YORK CITY—361
      2:15 p. m.—Musical program.
      3:45 p. m.—Harry Spear, songs.
      4 p. m.—Mariel Doublier, solos.
      4:15 p. m.—Silvio Dirienzo, pianist.
      4:30 p. m.—Burr McIntosh, "Cheerful Philosopher."
      7:30 p. m.—Children's Hour; Uncle Robert.
      7:30 p. m.—Shell Beach Trio.
      10:45 p. m.—Willard Robinson, enter-tailer.
      10:45 p. m.—Halabin Orchestra.
      10:45 p. m.—Halabin Orchestra.
      10:45 p. m.—Halabin Orchestra.
      10:46 p. m.—Halabin Orchestra.
      10:47 p. m.—Silver Silper Revue.
      10:48 p. m.—Halabin Orchestra.
      10:49 p. m.—Silver Silper Robert.
      10:49 p. m.—Silver Silper Robert.
      10:49 p. m.—Willard Robinson's Orchestra.
      10:49 p. m
    - 7:30 p. m.—Burr McIntosh, "Cheerful Philosopher."

      8 p. m.—John Cassidy, barytone.
      8:15 p. m.—Rose Balglan, pianist.
      8:30 p. m.—Clarence Williams' Trio.
      9:15 p. m.—Alex Melville, barytone; Evelyn Allen, soprano; Frank Ochs, tenor.
      10 p. m.—Musical program.
      10:30 p. m.—Roseland Dance Orchestra.
      11:30 p. m.—Sliver Slipper Revue.
      12 p. m.—Sliver Slipper Revue.
      13 p. m.—Sliver Slipper Revue.
      11:15 a. m.—Betty Brainerd, "We Women."
      11:2 m.—Olcott Vail's String Ensemble.
      11:230 p. m.—Luncheon.
      3 p. m.—Luncheon.
      3 p. m.—Charlotte Corthan, soprano; Milliams.
      7:30 p. m.—Patrick O'Connor, Thomas of p. m.—Charlotte Corthan, soprano; W. Robison, Southern Airs.
      7:30 p. m.—Ernie Golden's Orchestra.
      7:30 p. m.—Patrick O'Connor, Thomas of p. m.—Women's Arts Exposition.
      8:15 p. m.—Women's Arts Exposition.
      8:15 p. m.—Robert Chree, barytone.
      8:30 p. m.—Brankaman Hour of Music.
      10 p. m.—"Helps for Better Reception."
      8:15 p. m.—Robert Chree, barytone.
      8:30 p. m.—Brankaman Hour of Music.
      10 p. m.—Women's Arts Exposition.
      8:15 p. m.—Hardman Hour of Music.
      10 p. m.—Women's Arts Exposition.
      8:15 p. m.—Brankaman Hour of Music.
      10 p. m.—Women's Arts Exposition.
      8:15 p. m.—Scores (quarter hourly).
      9 p. m.—Brankaman Hour of Music.
      10 p. m.—Suray V. Turits, soprano.
    - WFBH-NEW YORK CITY-273 2 p. m.—Eddle Meyer's Orchestra.
      3 p. m.—Studio program.
      4 p. m.—Baseball scores (quarter hourly).
      4:05 p. m.—Studio program.
      4:30 p. m.—Female trio.
      5 p. m.—Orchestra.
      6 p. m.—Orchestra selections.
      - WEBJ-NEW YORK CITY-273
    - 8:50 p. m.—Leon H. Fox violinist.

      WOKO—NEW YORK CITY—233
      8:30-11 p. m.—Bike races; band concert.

      WAHG—RICHMOND HILL, N. Y.—316
      12:30 p. m.—Groen and Perry, dulcimer.
      7:30 p. m.—Thornton Fisher, sports.
      7:45 p. m.—Seymour Herscher, pianist.
      8 p. m.—Aaron Tuchinsky, violinist.
      8:15 p. m.—Myrtle Whitt, songs.
      8:30 p. m.—Professor Mayne. "Speech."
      8:45 p. m.—Augustine Paquillard, soprano.
      9 p. m.—Artists' recital.
      10 p. m.—Radio Question Box.
      10:15-12 p. m.—Frank Lauria's Orchestra.
      WOR—NEWARK—405 chestra.

      WNYC—NEW YORK CITY—526

      (Closed for WNYC staff
      - 12:30 p. m.—Women's Arts and Industries Exposition Luncheon. 3-3:30 p. m.—Women's Arts Exposition reatures.

        p. m.—Women's Arts Exposition features.

        p. m.—Olcott Vail's String Ensemble.

        130 p. m.—Bert Roborn's Orchestra.

        115 p. m.—Luella Burns, soprano.

        p. m.—Women's Arts Exposition features.
    - 10:15-12 p. m.—Frank Lauria's Orchest

      WOR—NEWARK—405
      6:45-7:15-7:45 a. m.—Gym class.
      2:30 p. m.—Morton Gould, planist.
      2:45 p. m.—Professor J. P. Santamarins
      3 p. m.—Murray Wachsman, barytone.
      3:15 p. m.—Morton Gould, composer.
      3:30 p. m.—William Field, barytone.
      3:45 p. m.—B. P. Adams, "Keats."
      6:16 p. m.—"Words Mispronounced."
      6:17 p. m.—"Sports," Bill Wathey.
      6:30 p. m.—Man in the Moon Stories."
      7 p. m.—Shelton Ensemble.
      WGCP—NEWARK—405
      2:45 p. m.—Songs; race results (h. hourly).
      8 p. m.—Steele and Heageny songs. 9 p. m.—Jack Smith, 9:15 p. m.—Lew Pollack, Jack Yellen, 9:30 p. m.—Moe Mann, barytone. p. m.—Dr. Hans Hans, violations 215 p. m.—Bible questions and answers, WAHG—RICHMOND HILL, N. Y.—316
      - 6:45-7:15-7:45 a m.—Gym class.
        2:30 p. m.—Marion Adams, soprano.
        2:45 p. m.—Yama Yama Boys.
        3 p. m.—Richard C. Hartt, tenor.
        8:15 p. m.—Warion Adams, soprano.
        3:30 p. m.—Yama Yama Boys.
        3:45 p. m.—Ward Yama Boys.
        3:45 p. m.—Words Mispronounced."
        6:17 p. m.—Shelton Ensemble.
        7:15 p. m.—Shelton Ensemble.
        7:15 p. m.—Zitt's Casino Orchestra.
        8 p. m.—Maybelle Cowen's Ensemble.
        8:45 p. m.—Archie Slater's Orchestra.
    - .35 p. m.—Transcommen. 0:20 p. m.—Less Tissot's Orchestra. WFI—PHILADELPHIA—395 12:30 p. m.—Jimmy Jones's Orchest; 2-8 p. m.—Concert orchestra; playled 4:30 p. m.—Dance music, 7:30 p. m.—Dream Daddy, 10 p. m.—Dance orchestra, 10:30 p. m.—Rufus and Rastus, sopranos.

      9:50 p. m.—Mischa Goodman, violinist.

      10 p. m.—Ballin and Race, plano duo.

      10:15 p. m.—Helene and Marguerite Herval.

      10:35 p. m.—Micha Goodman, violinist.
    - 11 p. m.—Popular program.
      WIP—PHILADELPHIA—508 WIP—PHILADELPHIA—308
      6.45 a. m.—Setting-up exercises.
      10 a. m.—Menu.
      1 p. m.—Luncheon music.
      3 p. m.—Artist recital.
      6.05 p. m.—Dinner music.
      7 p. m.—Bedtime story.
      WCAU—PHILADELPHIA—278
      8 n. m.—Recital. WAAM—NEWARK—263
      p. m.—Lester Coburger, pianist; That
      Cohick, tenor.
      3 p. m.—Alice Laurie, soprano.
      8:15 p. m.—Lauries Trio.
      8:45 p. m.—Lauries Trio.
      9:50 p. m.—Claude Rhys, tenor.
      10 p. m.—Grace Racanelle, soprano.
      10:20 p. m.—Hartley Joy Boys.
      WFI—PHILADELPHIA—395
      6:45 p. m.—Roof garden, broadcast. 1. m.—Recital.
      2. m.—Robert Fraser, singer.
      30 p. m.—Rennie Cormack, songs.
      30 p. m.—Jack Myers's dance music.
      WOO—PHILADELPHIA—508
    - 2 noon—Luncheon music.

      46 p. m.—Grand organ; trumpets.

      30 p. m.—Dinner music.

      30 p. m.—Musical program by artists.

      9 p. m.—Organ recital.

      9 p. m.—Dance music.

      WFG—ATLANTIC CUTY—300

      p. m.—Trio dinner music.

      p. m.—Concert orchestra.

      9 280 p. m.—Dance overheatra. p. m.—Seaside Trio.

      30 p. m.—Fashion review,
      p. m.—Seaside Trio.

      1:15 p. m.—Strand organ recital.

      WGY—SCHENECTADY—380
    - WGY-SCHENECTADY-380
      p. m.—Music; fashion talk.
      130 p. m.—Sunday school lesson.
      p. m.—Strand Theater Orchestra.
      130 p. m.—Scores and health talk.
      145 p. m.—Comedy, "Alice."
      150 p. m.—Theresa Berberich, contral:
      WGY Orchestra.
      WRW-TARRYTOWN, N. Y.-278
      105 p. m.—Musical program:

hourly).

8 p. m.—Steele and Heageny songs.

8:15 p. m.—Bob Ward's little wards.

8:30 p. m.—Hoch and Jerome.

8:45 p. m.—Clarence Williams's Trio.

9 p. m.—Jack Smith.

45 p. m.—Ukulele Lou Hayes.

p. m.—Strickland's Orchestra.

WAAM—NEWARK—263

WRW—TARRYTOWN, N. Z.—
9:05 p. m.—Musical pregram; score
9:40 p. m.—Almo Entertainers.
10:05 p. m.—WRW Orchestra.
10:30 p. m.—Almo Entertainers.
11:05 p. m.—WRW Orchestra.
11:05 p. m.—WRW Orchestra.
11:05 p. m.—Trio dinner music.
12:30 p. m.—Trio dinner music.
13:30 p. m.—Recital,
10 p. m.—Jack Little, songs.
11 p. m.—Jack Little, songs.
11 p. m.—Jack Little, songs.
12 p. m.—Vunger gentles.
13:30 p. m.—Supper music.
14:30 p. m.—Yunger gentles.
15:30 p. m.—Yung peeple's particle.

### SATURDAY

- WJZ-NEW YORK CITY-455
  115 p. m.—Irwin Abrams' Orchestra.
  2, 4, 5:20, 8 and 10:25 p. m.—News.
  46 p. m.—Scores, racing (half-hourly),
  126 p. m.—Market reports.
  150 p. m.—Financial summary.
  150 p. m.—Baseball, racing returns,
  17 p. m.—Nathan Abas's Orchestra.
  18 p. m.—Scores and racing results.
- ment"; Jewish music. 10:30 p. m.—Joseph Knecht's Orchestra. WEAF—NEW YORK CITY—492

- p. m.—Orchestra
  p. m.—Bert Lowes' Entertainers,
  p. m.—Scores (quarter hourly).
  iii p. m.—Montana Ramblers,
  iii p. m.—Studio program.
  iii p. m.—Studio program.
  iii p. m.—Suray V Turits, soprane,
  p. m.—Loomis' Orchestra.
  p. m.—Southern Serenaders,
  1.30 p. m.—Brony program.
- p. m.—Bronx program. WRNY—NEW YORK-CITY—259 WRNY—NEW YORK. CITY—259

  12 m—Luncheon hour entertainment.
  12:30 p. m.—Bunn Bros. Trio.
  1 p. m.—Radio Industry Hour.
  1:30 p. m.—Charles Reed, tenor.
  1:45 p. m.—Studio feature.
  7 p. m.—"Whose Birthday To-day?"
  7:05 p. m.—High Spots in Sports.
  7:10 p. m.—Commerce of the Day.
  7:20 p. m.—Fairy Tales.
  7:40 p. m.—"Dentistry Thoughts."
  7:45 p. m.—Concert Orchestre.
  8 p. m.—Concert Orchestre.
- 7.45 p. m.—Romantic Piano Series, 8 p. m.—Concert Orchestra.
  8.15 p. m.—Motion Picture Series, 8:30 p. m.—Iris Brussels, pianist. 8:45 p. m.—Yantonio on the Radio, 9 p. m.—'Dyeing Clothes."
  1.15 p. m.—Rita Sebastben, contralto, 30 p. m.—Bernstein Trio. 10 p. m.—"Up and Down Broadway."
  12 p. m.—DX Hound Hour; Ferrucci's Or-
- 9 p. m.—Brown Brothers and Company,
  9:40 p. m.—Emma Ahlers, soprano.
  9:55 p. m.—Fred Ehrenberg, musical saw.
  10:10 sp. m.—Regina Besner, planist.
  10:30 p. m.—Police alarms; weather.
  WNCA—NEW YORK CITY—341
- tures.
  9 p. m.—Musical program.
  10 p. m.—Women's Arts Exposition.
  11-12 p. m.—Ernie Golden's Orchestra.
  WOKO—NEW YORK CITY—233 3:15 p. m.—Kenneth Moltz, tenor. 8:35 p. m.—Jerome Lama, musical saw. 8:50 p. m.—Beatrice Meisler, recitations. 9:05 p. m.—Sarah Sommers, whistler. WBBR—STATEN ISLAND, N. Y.—278
- 12:30 p. m.—Musical program. 12-2 a. m.—Bensonian's dance music. WOR—NEWARK—405
- 45 p. m.-Archie Slater's Orchestra. 30 p. m.—Helene and Marguerite Herve.
- WGCP-NEWARK-405
  2:45 p. m.—Songs; race results (half hourly).
  4 p. m.—Ukelele Trio.
  4:30 p. m.—Indianians Orchestra.
  WAAM-NEWARK-263
- p. m.—Roof garden, broadcast. m.—"Philadelphia Mail Quartet. WLIT—PHILADELPHIA—395 4:30 p. m.—Dance music. 7:30 p. m.—Concert orchestra. WOO—PHILADELPHIA—508
- 7:30 p. m.—Dinner music, WIP—PHILADELPHIA—508 o. m.—Play by play description of foot call game, University of Pennsylvania ys. Ursinus.
  6:05 p. m.—Dinner music.
  7 p. m.—Bedtime story; roll call.
  8 p. m.—Artist recital.
  10:05 p. m.—Dance music.
  11:05 p. m.—Organ recital.
  WIG—ATLANTIC CITY—300
- p. m.—Dinner music.
  p. m.—Evening concert.
  0:30 p. m.—Steeplechase
  tra; Nick Nichols, directo WHAR—ATLANTIC CITY—275 9 p. m.—Seaside Trio. WGY—SCHENECTADY—380
- 9:30 p. m.—Dance music.
  WRW—TARRYTOWN, N. Y.—273
  10:36 p. m.—Entertainers.
  11:35 p. m.—Entertainers.
  11:35 p. m.—Dance orchetstra.
  WGR—BUFFALO, N. Y.—319
  2:30-4:30 p. m.—Concert.
  WGC—WASHINGTON—489
  2. p. m.—Washington Orchestra.
- WRC-WASHINGTON-459

  2 p. m.—Washington Orchestra.

  3 p. m.—Bible talik,

  3:15 p. m.—Musical program.

  11:30 p. m.—'Crandall's Saturday Night-HRKA—PITTSBURGH—309 2:20-7 p. m.—Scores (half hourly). 5:45 p. m.—Westinghouse Band.

Dance Orchestras for This Week

WRW WCAP WHN

WBZ WLIT WGCP WJY WMCA

Royal Jazz Band
Asbury Park
Wm. West's
Arrowhead
Lew Krewger's
Dance music
Vincent Lopez

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| FOR GREATER     | 43 Plate 4.50   | PLUG        |
|                 | VERNIER         |             |
| SELECTIVITY AND | 11 Plate \$4.50 | 3           |
| LOUDER, CLEARER | 15 Plate 4.75   | A-70 12     |
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## THE NEW YORK HERALD New York & Tribune

SECTION SIX

SUNDAY, FEBRUARY 22, 1925

20 PAGES

## What Radio Means to Isolated People

Cut Off by Winter Snows, Separated by Great Distances, These Folk Get Real, Living Benefit From Broadcast Programs of Music and Education

By WALTER CHAPPELLE



Good music entertainment and education are carried free by radio to the most distant human habitation

To-day as I look out of the window the snow lies three feet deep on the level, running in unbroken lines up to the pine woods in the west, to the sea in the east, the only moving thing visible being a double team of horses crossing the furthest hill after opening the mail route, the snow having drifted over from the previous day's storm. The nearest neighbor is three miles away, the nearest city fifteen. For six months we are practically isolated. Last winter we passed one month without newspapers or magazines of any type.

This year we determined that we should not pass through this isolated period without a radio receiver. At a slight sacrifice we invested in one. I assure you that it has not been responsible for the emptiness of the several seats which we used to fill in Broadway theaters when living in New York, but, on the other hand, has kept us in touch with the innovations which several far-sighted professionals have seen fit to broadcast. Then, too, we have already planned our trip as soon as the roads open in the spring, before planting time is upon us, to make a point of getting down to see in full regalia certain of the echoes which have reached us from

time to time during these last winter | of a sort. The things in the cellar froze. | the benefits the farmer receives from

rural district of New England. It Right here I wish to say that "Roxy" animals. Then one morning an erstwhile Herald Tribune Radio Magazine of the hard-earned cash we plan to spend. Also we have lived in New York some ten or fifteen years and never had time to attend a Philharmonic-that is, we never made the effort to find the time. We have enjoyed several this winter and have become in consequence Philharmonic hounds. We learned something of the League of Nations through Viscount Cecil's speech at the Hotel Astor dinner, something of the hopes and aims of Walter Damrosch at his dinner recently. More than this, we learned something of the business of running our government when we listened in on the budget meeting and heard President Coolidge tell of the finances of the United States of America. I have never read printed speeches through before, but I listened through on

#### The Exiles

You will probably wave aside what I say as an exception, a metropolitanite exiled. To be trite, "the exception proves the rule." Other exiles exist within the radius of a few miles of us. A letter I received from one contains this:

"Fred was gone all week. It was lonely without him, but there was excitement

I fed, watered and otherwise valeted the radio which appeared recently in The will not be the least of the favored. And employee of Fred's called for a handout if John McCormack is to be heard in con- and insisted on coming in. Fed him and confirmation I might strive to record here. cert his box office will receive its share had difficulty in getting rid of him. I became hard-boiled and shook him, but afterward put a loaded gun on the table lest he return. Next came the big wind. Blew the outside antenna right in two and wound the longest (if there is one) half in an apple tree. Had to wade out behind the barn to get it out and got one ear touched. Gosh, it was cold and terrifically breezy! WEAF coming in strong to-night and excellent music."

There is yet another one up in the hills behind us somewhere who has one of the first De Forests put out. So much for the exceptions now for the rule.

"My boy has made himself a radio receiver this year," the native clerk beamed over the grocery counter to the gathered evening bunch. "It works fine. Heard all about the eclipse. The older boy, Ed, he was thinking some of going away, but has gotten kinda interested in seeing if he can't make the apple trees bear heavier than last year. Now, with the market reports coming in by radio, seems as though there might be a chance of doing something with the crop, 'side of lettin' what you don't need rot."

I might go on, but the published reports of the Bureau of Agriculture of

far more convincing than any word of The few experiences which I set forth are confined to about a hundred persons. Multiply this by any reasonable figure and you will have an idea of what good stuff through the receivers mean to the great mass of human beings, who are giving the best of their limited means the acme of service when called upon to stoke the engines of the great ship United

"What do you hear ovy that thing?" an old farmer asked me one evening last fall, as he stopped by with the milk. "Music," I said. "Want to listen?"

"Music!" he scoffed. "You waste your time listenin' to music? I hearn gude music ovy to Fireman's Hall last summy when a quartet sang. Wudn't walk a mile to lissen again. Well," as I still offered the phones, "I might"-

The Waldorf was playing. An hour later he reluctantly put down the phones with a sigh. "This," he said, "ain't gettin" around to customers. Say," he paused at the door, "how much did you say one o' them things cost you?"

This, which is my experience, is the experience among all those people who are

Continued on page two

### Two-way Radio Communication With a Submerged Submarine Is Now Possible

Dr. Rogers Performs Successful Experiments With Subaqueous Wireless Transmission

By THOMAS STEVENSON

and subdue almost the entire world with submarines may occupy the most interesting pages of history for future generations. Horrible as will be the account of ships sunk without warning and of thousands of innocent lives taken, even more thrilling will be the story of the means taken to combat the menace.

Outstanding among the developments which helped to combat the submarine was the development of undersea wireless. The struggle of Dr. James Harris Rogers, of Hyattsville, Md., to perfect such apparatus and his fight for credit for the invention should interest every "fan."

Dr. Rogers is a man well advanced in vears and a scientist who from youth to old age has devoted himself to electrical research and the study of electrical phenomena. As early as 1908 Dr. Rogers entertained the theory that messages and signals could be sent and received by means of ground antenna, and by actual tests made in that year established that they could be sent and received. The messages and signals were received by ground antenna, and Dr. Rogers thereafter made only occasional tests of his discovery.

The outbreak of the World War brought Dr. Rogers to the realization that the underground antenna might be used with good results in dugouts, on submarines and as a valuable adjunct to coast defense. Incited by that realization, he actively resumed his experiments with ground antenna and made arrangements with Harry T. Lyon, a youth nineteen years old, to assist him in making the necessary tests.

After developing the practicability and utility of insulated underground antenna Dr. Rogers and Lyon then proceeded to test the efficiency of uninsulated antenna, whether laid under ground or under water, on the bottom or above the bottom and beneath the surface of water.

A test was also made with insulated wires laid on the bottom of a lake, and communication was established between the lake and Dr. Rogers's laboratory. This last test was repeated for the information of navy experts and for the purpose of showing that such a system could be used on sumbarines.

#### Tests Excite Interest

These tests naturally excited the intense interest of the navy, which was bending its energies to check the operations of enemy submarines. The Navy Department

far away. I do not mean necessarily in

snows lie heaviest in winter and acres of

run-out farms stay muffled to the summer

sun, a continued menace to the fertility

of America, the last generation of farm-

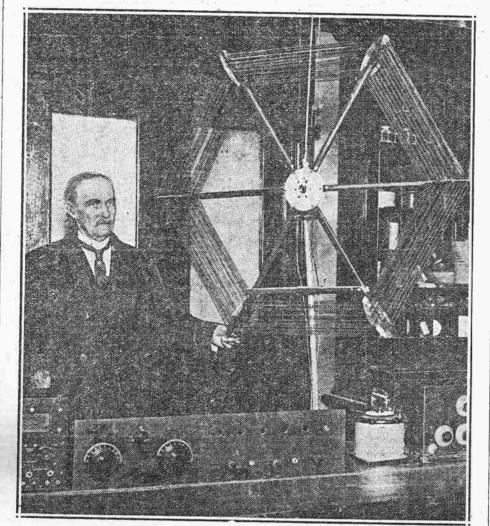
ers. old men and discouraged, sit night

their own accord.

HE attempt of Germany to terrify facilities for test experiments with Commander Le Clair of the navy request- | grounded it to the north end of the other its systems as might be feasible and ing information as to what had been done practicable without interfering with the by Lyon. That information was not furtransaction of government business. It

> contract Commander Hooper of the navy requested Dr. Rogers to go to New Or- success with his experiments. leans to test the system. Dr. Rogers was | Hampered as he was by the lack of

> was also agreed that the inventors would Rogers again wrote to Commander Le keep secret all knowledge of the invention. | Clair asking what had been done by Lyon answer that Lyon had not had very much



Dr. J. H. Rogers, Hyattsville, Md., inventor of the underground and underwater radio communication systems, is here shown with the loop antenna he recently used in receiving signals from across the Atlantic. During this reception the loop antenna is submerged in a well.

unable to go and sent Lyon in his place. whole-hearted co-operation on the part of Before Lyon was permitted to make any experiments he was required to enroll in the navy, and thereby become subject to the orders and control of that department. In consequence of Lyon's relations to the navy he made secret reports of his tests to the navy and Dr. Rogers found himself unable to secure such reports. In addition to this, bad feeling broke out between Dr. Rogers and Lyon when the latter learned that Dr. Rogers had sought a patent in his own name instead of jointly.

Lyon and the lack of information as to experiments made by the latter, Dr. Rogers determined to make experiments of his own as to the feasibility of submarine radio communication. Not having a submarine at his disposal for uninterrupted and uncontrolled experimentation, he simulated a submarine by laying underground two lengths of pipe each 100 feet long, the inner ends of the pipes being slightly separated but connected by granted credit for the invention to Dr. wire. He then ran an insulated wire from | Rogers. expressly agreed to afford Dr. Rogers such | In February, 1918, Dr. Rogers wrote to | the north window of his laboratory and

pipe. The inner ends of the insulated wire were connected in the laboratory to nished. Under date of April 12, 1918, Dr. the receiving apparatus, and a variable condenser was also connected in the circuit. The iron pipes took the place of a Immediately after the execution of that at Key West and received in reply the curt submarine and the insulated wires connected with the ends of the pipes were Experiments With Loop

> During the latter part of February or the first part of March, 1918, John A. Willoughby and Percival D. Lowell began experiments on single turn loops at the Bureau of Standards to establish the possibility of transmitting and receiving radio messages in wave length suitable for submarine work.

> On March 4 Willoughby made a single turn loop of 150 feet long by 50 feet high, on which he was able to get a range of wave lengths from 100 to 1,500 meters. By means of that loop he was able to receive signals better than any theretofore received from any of his tests. He claimed that it was at this time that he got the idea of using the hull of a submarine as one part of the loop. As he had no submarine on which to make a test of that idea he used a radiator in his house for one side of the loop in place of a submarine and found that the loop worked satisfactorily.

> For the purpose of securing an opportunity to try his tests on a submarine Willoughby reported the invention to Dr. Rosa, of the Bureau of Standards. On the basis of the report the matter of making tests was taken up with Commander Le Clair, of the navy, and at his suggestion Willoughby and Lowell were loaned to the department.

After the war was over the Commissioner of Patents granted a patent to Willoughby and Lowell for a special kind of loop antenna designed for vessels of metal, and particularly for submarines. This action was taken by the Patent Office on the ground that "the test made by Lyon at Key West of the invention of the antenna grounded to the bow and stern of a submarine was not a success, and that for the additional reason that the test was made while the submarine was not submerged, the test was not a reduction to practice; third, that from April to December, 1918, Rogers was not active in making tests of his invention under service conditions, and that he was not diligent in filing his application for

The Court of Appeals of the District of Columbia, however, reversed this decision of the Commissioner of Patents and Copyright, 1925.

### What Radio Means to Isolated People

Continued from page one

distance, but in spirit and understanding. them. Their sons, one or two, two or | pearing more and more often at town Little and big pockets of people whom we three, here and there, who have not been all know, distributed throughout the entire country, are seeking with open hands for this greater thing which radio has the realizing their helplessness against their own lack of knowledge and their own inpower to grant them and has promised heritance of poverty and disease, without to grant them. They want music, they understanding the aid that is just beyond want education, they want intelligent disreach of the hand. cussion of national politics and the world Such a boy, I heard a short time ago, questions of finance, trade and disarma-

has bought a small radio receiver and ment. These they wish explained so that through it he is going to expect the aid they in turn may logically interpret of It is interesting to watch the stride of mand his birthright of education. He their growth, these pockets of people. Radio has become almost godlike to them of his corn patches, the white pine blister | get it? in their reverence for it. Jazz and vaudeout of his woodlots, the dry rot out of his ville in their turn, but only in their turn. orchards, and how and where he can The dials spin seeking something more. market his products. Is he going to get Back in the country sections, where the the information?

### Woman on the Farm

Records show us and it has been proved farm is beginning to take interest in some one who could tell me things as well." after night while the world marches over things without her domicile. She is ap-

meetings and taking voice in the distribuable to tear themselves away to city | tion of the public funds which she has routine, have sat, discouraged as well, swelled by her individual taxes. Last year in this particular district every increase of funds voted for the public schools and sanitation was carried by the woman vote. The women on the farms are asking for information of government, information of household appliances which will relieve their drudgery, knowledge of how to plant their home gardens so that which he has the right to demand from | they may gain the most beauty therefrom, those more fortunate—he is going to de- and last but not least they are asking over and over again for music, good muwants to know how to fight the borers out | sic, and amusement. Are they going to

Not so far away where the small village sleeps quietly waiting the next spring is a voung native, a college graduate studying through a correspondence school for his bar examinations. But he is losing heart. "It is difficult," he says: "I have a wife and baby who need my care. And this by observation that the woman on the book studying is all right if I only had Is he going to find that some one?

A carpenter, a man who has taught himself his own trade, who takes out his boat at sunrise to fish, returns, has his breakfast and is on the job at 7:30. During his evenings he built his own home. He talked radio to me the other day. "Iwant to hear good things when I get my radio receiver, things I have never heard before, things that will help me to know." Is he going to hear these things?

These are my examples. I could duplicate them many times. Seeking, reaching minds are clutching tightly at what little has been given to them already. Closed minds have opened a little mite to the value of the offerings.

The miracles of yesterday are to-day's luxuries, to-morrow's necessities. Mute lips are learning to speak, blind eyes to see, deaf ears to hear and brains, stupefied, stunted, starved, have in their turn a right to demand and receive. The motion picture and the call of the great war have lifted them out of the cellar of their confinement, and frail leaves are even now opening up to the sun. Radio must cultivate and water them.

### **Construction of Tuned Intermediate Transformers**

number of turns. The first condenser was 3.9 per cent larger than the second, and the third was 6.8 per cent smaller.

Now, in order that the circuits be tuned to the same frequency, it is required the product of the capacity and the inductance be the same for all. But the inductance of a coil is very nearly proportional to the square of the number of turns. Hence, for small changes in the turns the required change in the turns is one-half the percentage deviation of the condenser from the mean. That is, the winding across which the first condenser is connected should have 1.95 per cent fewer turns than 1,000, or 980 turns; and the winding across which the third is connected should have 3.4 per cent greater number of turns than 1,000, or 1,034 turns.

#### Precautions to Take in Winding

In winding both the primary and secondary it is important that a certain tension be exerted on the wire so that the coils will not bulk too much. That is, the windings should be firm and not spongy. It is also important that the same tension be exerted for all the coils, or the distributed capacity and the inductance will be different. If these precautions are ob- of the drill. A brake of some kind should

Dinner From WFBH

The seventh annual dinner of the

Grand Street Boys' Association, Inc.,

will be held this evening, Washing-

ton's Birthday, at the Hotel Commo

dore. An attendance of 4.000 is ex

pected at the affair, comprising mem-

professional worlds. Judge Max S

Levine, president of the Grand Street

Boys' Association, will act as toast

master at the dinner. Several gentle

men of prominence will make ad

**Case Glee Club Concert** 

bers of the political, commercial and

Grand Street Boys'

served, it is not necessary to adjust the | be provided on the spool so it is dead beat, coils any further. A closer adjustment of | that is, so it stops as soon as the drill stops, the tuning would be meaningless, because the capacity of the leads to the tubes and the capacity of the grid circuit differ, and the latter depends somewhat on the set- If a wooden spool, a rod driven through ting of the filament rheostat. The tuning is usually close enough. If wooden spools are used, the tuning

condensers may be measured before mounting, which is done after the spools have been wound. The same pressure should be used on the mounting screws for all the condenser, because the pressure exerted on the screws will change the

#### Method of Winding Coils It is a very tedious procedure to wind

these coils by hand. Hence some kind of winding jig should be used. The simplest iig to use and one which is nearly always available, is one made of a hand drill, as is illustrated in Fig. 4. The drill is placed horizontally in a vice and the coil to be wound is placed in the chuck in the most convenient manner. The wire spool is placed on a rod placed parallel to the axis

or there will be no end of trouble due to kinking of the wire. The chucking of the spools depends on the kind of spool used. the center hole will do nicely. If the other type has been selected a strip of brass or composition in which holes have been drilled to fit over the binding posts may be used. A long screw through a hole half way between these may be used for insertion into the drill chuck.

The best way to keep track of the number of turns is to use a revolution counter. But a fairly good substitute is to determine the gear ratio of the hand drill and then count the number of turns of the handle. This part of the work is imporant and is rather trying.

mary windings should be about 225. The basic number in the secondaries should be 1,000, except as modified as suggested

The number of turns in each of the pri-

on the spool to the terminal wire on bind- | ing condenser is not visible on the outside.

away in the corner of winding space and cover with a little beeswax. When the required number of turns have been put on for the primary, cut the wire and connect and solder as before to terminal wire on binding post B. Next put a couple of ayers of paper, preferably paraffined, over the primary. Then fasten the secondary on in the same manner, beginning with terminal marked F. Over the secondary put a layer or two of paper of the same kind as was used between the windings. Over this a layer of some stronger material, such as bookbinders' cloth, of a color to match the color of the spool. This completes the transformer except for the

In the case of the wooden spools the mounting angles are simply fastened to the form by means of small wood screws. as shown in Fig. 1. In the other case one of the long screws used to hold the form together may be removed, if done carefully, and the mounting angles placed under the head and the nut. In either case the appearance of the finished transformer will be like that shown in Fig. 1, except in Start the winding by connecting the wire | the hard rubber composition case the tun-

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Colonel Theodore Roosevelt, the Hon.
James J. Walker and Acting Mayor
William T. Collins. The speeches
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station WFBH.

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on the "HAWLEY" rechargeable "B" storage batteries, Why? Because they contain more parts—super quality and give forth no sizzling cracking sounds as when wood is used for supports due to electrical leakage. Because they are the ORIGINAL—more experience back of them. Because I prefer to give a real usable unit in preference to a quick sale and consequent dissatisfaction. Because I believe the preference is for continued clear, better reception in preference to a continued worry of a

cast the glee club in connection with the regular Monday night concert. Alleged Infringer Enjoined Judge Albert L. Reeves, of the United States District Court for the Western District of Missouri, has granted an injunction to Charles Freshman Company, Inc., of New York City, against the American Radio Manufacturing Company, of Kansas

Manufacturing Company, of Kansas City, Mo., restraining the latter from using the word "Masterpiece" and from offering for sale radio receiving sets similar to the Freshman Masterce, and from offering to supply as the Freshman product any radio receiving set or part thereof which is not actually the genuine product of

the plaintiff.

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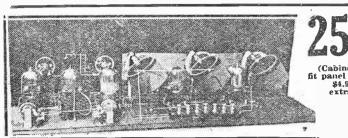
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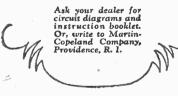
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FOR power, for cutting thru locals, for speaker volume on distant stations—all with 3 tubes nothing equals the Rasla Reflex! The

combines Rasla circuit efficiency with MAR-CO precision. It comes to you complete-with the personal seal of approval of J. Clyde Davidson, perfector of the Rasla 3-tube reflex—for \$37.50.

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During the year 1924, The Herald Tribune printed more RADIO advertising than any other New York morning or Sunday newspaper.

**1** 



### Some Causes of Interference

Home Appliances and Regenerative Receivers Are Responsible for Many Ether Disturbances

By Everett M. Walker

ADIO fans are still blaming all interference that sounds the least Super-Het bit like code interference on commercial stations which maintain Builders! constant communication with vessels at sea. These ships, however, are not always the cause, for sometimes the much complained-of | \*\*Complete the terodynamic real to real interference is caused by static, power leaks, generators, violet ray machines and other household appliances which have a tendency to highest terms the floridasson the floridasson to find the flo spark. Wherever a spark of any kind exists in the vicinity of a radio receiver it is almost sure to be heard, and if loud enough will cause formers. Take no charal no charal considerable interference.

Of late tuning around for the forementioned forms of interference and howls from regenerative sets has @become the favorite, but involuntary, plain. Commercial operators are only indoor sport of radio audiences. It allowed to use the transmitter for

would be hard, after listening night business purposes and personal conafter night to the whine or drone of versations are not allowed. induction interference and the howling of radiating receivers, to define commercial stations is sometimes no-

norance and indifference continue to may be eliminated by careful tuning play large parts in radiation nuisance. and usually it is not loud enough Not that any one who reads up even in to interfere to any great extent. The a small way does not understand the writer recalls one instance when a evil and, vaguely, the cause; but that local commercial station which was they fail or refuse to recognize the using a tube transmitter interfered fact that they themselves often are with a well planned concert being the means of ruining their neigh- broadcast on the higher broadcasting bors' enjoyment-and, incidentally, waves. The nature of the business

musical notes or clear speech. At occurs. best there is a mushiness which Another source of interference frethickens speech and garbles tones. If quently discussed and blamed to a in no other way a receiver owner can fr. greater degree than plausible, is tell when his tube is oscillating he that coming from amateur transmitsurely can in this way. The point ting stations. First of all it might where the clearest reception is ob- be a good plan to tell just who the tained is the proper operating point. amateur transmitter is and just what Bringing in distant stations will be a he does. Many people are of the opinbit more difficult, perhaps, but there ion that amateurs are a bunch of will be greater satisfaction all "kids," if we are permitted to use around. Where stations must be lo- the slang they choose to call them, cated by the beat-note method the still wearing short trousers. This, filament of the tube should be low- however, is a mistaken conception ered to the operating point the mo- which often leads people astray. Some ment the station's carrier wave is lo- of the most noted radio engineers cated, and tuned in without the beat still choose to be called amateurs. note. If every radio fan were to Take for example Major Armstrong, practice what has just been said it the man who has probably done more would in all probability eliminate for the development of this compliabout 50 per cent of the present in- cated science and art than any other terference which is so often blamed man known to the vast field and still on the commercial station.

of the transmitted wave. Frequency law. harmonics are lower than the funda- Since the adoption of the continumental frequency of the transmitting ous wave method of transmission by wave length of broadcasting stations.

the harmonic the more it decreases way. in volume. It is a well established After all most of the interference Since the trans-Atlantic stations use receiver. wave lengths of more than 12,000 meters, and in some cases as high as Opera Gems on Saturday 23,000, it is quite impossible for the half-wave harmonic to cause interference on broadcasting wave lengths.

encountered from commercial ship circles; Thomas Conkey, barytone; and land stations. The interference Frances Paperte, soprano, and from this source is, however, more Charles Schenk, tenor. often caused by foreign ships which The operatic numbers will be conare anchored in the big harbors wait- ducted by Ignatz Waghalter. ing to clear their traffic with one of the big land stations. Since the na- Ammonia or bicarbonate of soda ture of the business carried on by will check acid that has been spilled these stations is of utmost import- from a battery from eating into the

Interference from some of the local

ticeable on the higher broadcasting Despite the educational efforts ig- wave lengths. This, however, often was extremely important and was A radiating set never can be deliv- easily excused. With a well designed ering anything approaching sweet set interference of this kind seldom

he says he is proud of the fact he If the Supervisor of Radio wanted is an amateur. There are numerto be real mean he could make every ous other examples that could be owner of a radiating receiver apply cited. Amateurs are interested in for a license to transmit and until the radio art for the mere love of it the license was obtained prevent the and not for any commercial value they might thereby attain.

It has been assumed by radio lis- It is not likely that the amateur teners that much of the interference causes any of the interference which encountered during the recent trans- the broadcast listener encounters in Atlantic test was caused from har- the early evening, due to the fact he monics from high-powered trans-At- is required to cease all transmission lantic arc and alternator stations. It between the hours of 8 and 10:30 is a well known fact that harmonics p. m. on wave lengths between 150 are incidental waves differing in and 200 meters. This is not all, he length and frequency from the nat- is required to stand by during local ural wave length of the transmitting church services on Sundays. These station. They are fractional parts restrictions are placed upon him by

station, and are found above the nat- more than 98 per cent of the amaural wave length. Frequency har- teurs in the United States it is quite monics, however, could not cause in- possible that broadcast programs terference on broadcasting wave will be broken up or interfered with lengths, due to the fact that these from this source. Of course if a radio high-powered stations are far above fan has an antenna within a few hundred feet of a transmitting amateur it is probable that he will have a lit-Then, too, it is not likely that the tle interference. In this case, howwave-length harmonics would cause ever, the amateur is most always interference, inasmuch as the lower willing to meet the other party half

fact that the harmonic which is equal does not come from other transmitto just one-half the transmitting ting stations, but from electrical dewave is the strongest in audibility. vices that are in the vicinity of the

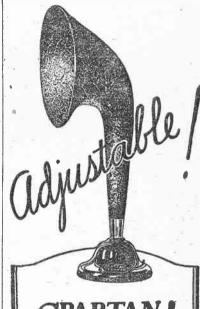
Evening Program

On Saturday evening from WOR In spite of the fact that these sta- an operatic program is to be pretions use exceedingly high power, the sented under the auspices of the harmonics to be heard on broadcast- Little Opera of America, Inc., which ing bands would be in the neighbor- was recently organized to foster hood of one twenty-fourth harmonic an American opera comique. Gems of the fundamental wave length, from several of the operas will be which, in all probability, would carry presented by artists of high attainbut a few miles. Therefore inter- ment, among whom are Leonard Snyference from this source would affect der, tenor; Maria Samson, lyric soonly those unfortunate enough to live prano, formerly of the Royal Opera within a few miles of these big sta- of Budapest; Louise Dose, former musical comedy star; Ernest Otto, Occasionally a little interference is bass, celebrated in English opera

ance, the radio fan can hardly com- liber of the cloth.



Chosen—after stiffest tests—by the majority of quality set builders. Not surprising, however, when you remember they re made and odest and largest exclusive transformer manufacturer. Follow the lead of the leaders—build or replace with Thordarsons. Recommended by best dealers. Audio frequencys 2-1, 25; 34-1, 24; 6-1, 24.50. Power Amplifying, pair 213. Interstage Power Amplifying. pair, \$18. Interstage Power Amplifying Transformer, \$8. Write for latest bulleting TRORDARSON ELECTRIC MFQ. CO.



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Also a heavy pressed metal bottom! Your family deserves a Spartan Speaker. Get them one! Metropolitan Distributors:

Masback Hardware Co. 80 Warren Street Spartan Electric Corp. 99 Chambers Street



### Construction and Adjustment of Efficient Tuned Intermediate Transformers

Contrary to Belief, These Units May Be Built With as Much Ease as Low-Loss Coils

By J. E. ANDERSON

frequency transformer than it is to make the hard rubber spools. a low loss radio frequency coil, say of the Let us first take up the wooden spools. basket-weave type. Nearly everybody has | Fig. 1 gives the dimensions of these and

ANY radio experimenters and | wooden spool, but it will look very much | inch long and two inches in diameter, with | first step toward adjusting the transformamateur set builders make their | better when finished. The constructor | a 1-16-inch wall and two hard rubber end | ers to the same intermediate frequency is own tuning coils and couplers, may take his choice, according to his purse own intermediate frequency transformers, difference in the efficiency of the two. thinking that this is an undertaking quite | Any one who has a high-speed lathe can difficult to make an efficient intermediate chine shop can make the end pieces for

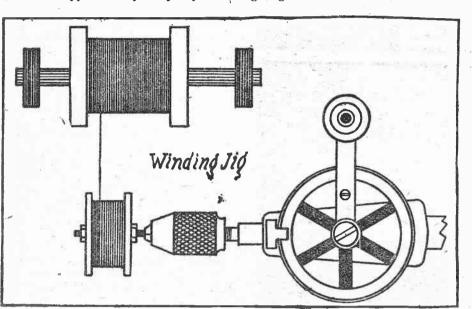


Fig. 4-Method of winding coils on spools

the required equipment and can easily | illustrates the assembly of them. The procure the required parts. The making overall diameter is 2.5 inches, the length and adjusting of the coils are relatively of the winding space is exactly 1 inch, simple tasks. Below will be described | the depth of the winding space is 5-16 a set which, when incorporated in a welldesigned super-heterodyne, has given | ing form is exactly 2 inches. The thickcoast-to-coast and trans-ocean service in

When these transformers are used in a circuit it is not necessary to employ a special intermediate frequency filter, because they are all tuned to the same frequency. At least three of the transformers will be required in a circuit. Four of them may be used in a receiver where extreme sensitivity is required, provided great care is exercised to see that stray coupling is reduced to a minimum. That is, they should be placed at right angles as far as they can be, and they should be separated by several inches. If four of them are used, however, the selectivity will be so great as to impair the quality of the signals, and the use of more than three is not recommended for ordinary broadcast reception.

The material required for the construction of three of these transformers will be

One-half pound of No. 36 double cotton-covered wire.

Three Dubilier condensers, type 601, .0001 microfarad capacity, with soldering lugs attached.

Three spools of wood or other insulating material, as described in detail

Six mounting angles, about half an

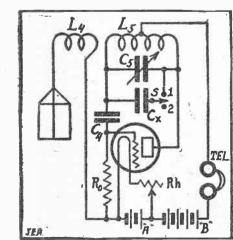


Fig. 3-Oscillator circuit for measuring capacity

inch high and three-eighths of an inch wide. Various screws and nuts.

Two kind of spools will be described. one made of wood and the other of hard rubber and composition. The latter will be somewhat more expensive than the of a piece of bakelite tubing exactly one At this stage of the construction the

of an inch and the diameter of the windness of the spool heads may be about

Fig. 1: Construction details of transformer spools

and B, 1 inch apart, are the binding posts | washer between each lug and the head of

appropriate distances from the edge of | Put the fine wires into the grooves and

the spool head. Small grooves are made cover with beeswax. Then put on the com-

heads through which the terminals are they will not work loose.

brought out. These holes are placed at

in the wood from these holes to the bind-

laid and covered with beeswax. At the

right in the figure is shown the secondary

side of the spool. F and G are the fila-

ment and grid terminals, placed % of an

inch apart, and c and d are the holes

through the spool heads through which

the wire is brought from the winding.

The tuning condenser is placed directly

on the F and G binding posts. In the

middle of the figure is shown a side view

of the assembled transformer. Wood

screws may be used to fasten the termi-

nals and the condenser. The terminal

lugs on the condenser may be used for

making connection to the secondary side

and smaller lugs may be used on the

primary side. The reason for placing the

binding posts on the primary side further

apart than on the secondary is to prevent

a possible short circuit, which would occur

if the screws should meet in the interior

of the wood. The hole through the center

of the spool is for the purpose of facili-

tating chucking the spool in the winding

Now let us go to the hard rubber-com-

pieces such as are shown in Fig. 2. All but they are reluctant about making their or according to availability. There is no the necessary dimensions are given in that figure. As in the previous case, the secondary terminals are placed five-eighths beyond their facilities. But it is no more turn out the wooden spools and any ma- of an inch apart, so that a Dubilier condenser will fit over them. And there is no reason why the distance between the primary terminals should not be the same in this case, and this is done, since it simplifies the making of the end pieces. The two extra holes in these end pieces are used for holding the spool together, for which purpose two 6-32 machine screws, brass, round heads, one and one-half inches long, are used. If these holes are placed one and one-half inches apart the screws will safely clear the condensers. The grooves shown on the back, or inside, view of the end piece are for the purpose of running the terminal wires from the inside of the form out to the winding space.

Method of Assembling Before assembling one of these hard rubber-composition spools it is necessary to fasten the terminals and the tuning condenser. First solder about five inches of the fine wire to each of the terminal lugs on the condenser. Then screw the condenser down to the secondary end piece, lugs next to hard rubber, using threequarter-inch, 6-32 brass round head machine screws. Nothing is to show on the outside but a couple of brass screws and work loose while connections are made to

the transformer subsequently. On the end piece used for the primary side of the coil two terminal lugs, to which short lengths of the fine wire have been soldered, are screwed down on the inside. 3-16 of an inch. At the left of Fig. 1 is using five-eighth-inch screws. Put the shown the primary side of the spool. P | lugs next to the hard rubber and put a

The spool is now ready to be assembled.

made, and if this and the winding are carefully done it is the last step. It is simply measuring the capacity of the condensers as they are connected in place. Although each of these is supposed to be a .0001 mfd. condenser, neither will probably be exactly that, and the three or more will not have the same value. It is not practical to attempt to select a number of them which have the same capacity. The variation from the average may be as high as 20 per cent. Such great variation would introduce large errors in the resonance frequency of the condensers, and would render the intermediate frequency amplifier broad and inefficient. The simplest remedy is to make allowances in the number of turns in the secondary windings according to the capacity of the condensers. How this is done will next be shown. A very simple way of measuring the ca-

pacity of the condensers is to connect them in turns across the tuning condenser of an oscillator and express the capacity in terms of divisions of the dial. Any of the well known oscillator circuits will do, and the one shown in Fig. 3 is about as easy to hook-up as any. Here L-5 is the oscillating coil, which may consist of forty turns of No. 24 double cotton covered wire wound on a three-inch tube, with a tap at the middle turn. C-5 is the tuning condenser, which may be an ordinary 500 micro-microfarad tuning condenser. C-x is nuts. Tighten the nuts so they will not | the condenser to be measured. S is a switch by means of which this condenser may be connected in parallel with the tuning condenser, or disconnected. C-4 may be a fixed .001 mfd. condenser and R-O about a 12,000-ohm resistance. Although an antenna and a coupling coil L-4 are shown in this diagram, these are not necessary unless the nearest broadcasting station is very far away. They should not be used unless absolutely necessary.

### Method of Measuring Condensers

Now label all the condensers to be measured so they may be identified. Then connect one of them across the tuning condenser C-5 and tune the circuit until the whistle from some station is heard. Pick out one near the middle of the dial of the tuning condenser or a little above. The weaker the whistle the better. Accurately find the point of zero beat. Estimate the point to a tenth of a division on the dial. Then disconnect the condenser by switching over to stop No. 2, and tune for zero beat with the same station as was used before. The difference between the two settings gives the capacity of the condenser for the plate and battery terminals, re- the screw, a precaution against accidental under measurement in terms of divisions spectively, of the primary winding, and | breaking of the fine wire as connections | on the dial. Measure all the others in the a and b are small holes through the spool are made. Again tighten the nuts so that same manner, making sure the leads to the unknown condensers are the same length for all.

The results obtained in a typical case on three condensers were as follows: position tubing on one of the spool ends, a. 21.3 divisions: b. 20.5 divisions: c. 18.1 ing posts, in which the fine wire may be | and then the second spool end on the tub- | divisions. Of these, condenser b was coning. Insert the long brass screws and sidered as the standard, and the number

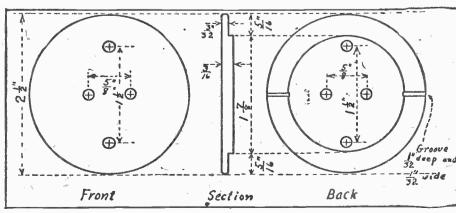


Fig. 2-Detailed sketch of end section

four loose ends of wire, to which the windings are to be connected. Mark the binding posts from 1 to 4, or by the customary letters P, B, F and G. Prepare position spools. Each of these is made up | as many of these spools as are required.

tighten firmly with a pair of nuts. Now | of turns in the secondary, across which it there will be four binding posts on the was connected, was made one thousand spool, two on each side, and there will be (1,000). Condenser a was larger than b. and therefore not so many turns were required in the secondary across which it was connected. Condenser c was smaller than b, and therefore it required a larger

Continued on page nineteen

opposition to the flow of oscillating current because of the building up and collapsing of the magnetic field that always surrounds anything which carries current. It forms no opposition to direct or continuous current except at the very start of the flow, because the field is built up once for all. No energy is used or required in field changes because there are no changes. A coil is therefore a "choke" for radio frequency just as a condenser "blocks" the passage of direct current. Whenever you want radio frequency to follow one of two paths and direct current to follow the other you can divide them by putting a radio frequency choke in one path and a direct current choke in the

Such an arrangement may well be required, or, at least, may be desirable in the plate circuit of a detector, especially of the Weagant divided circuit type, where the "B" battery circuit and the feed back

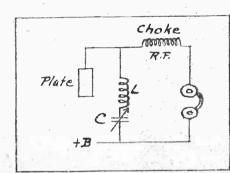


Fig. 2: How radio frequency and audio fre-

circuit are separate, as in Figure 1 and

Figure 2 shows the plate circuit of a generative circuit. In the plate of the detector is the rectified signal, an audio frequency component, a pulsating direct current from the B battery. There is also a radio frequency component which has leaked by the tube, partly by reason of the fact that the grid to plate path is just | quency or for the purpose of rejecting a condenser to radio frequency. It is the radio frequency component which is fed radio sets we tune to receive a frequency, back to the grid circuit by means of the and because of the high resistance of that ticker coil or by means of tuning the plate circuit with a variometer or a tuned in- on such an arrangement to keep out other ductance of any kind.

Figure 2 shows th eplate circuit of a

HE idea of a coil is that it forms an | through that direction. In this case, of | detector tube, and we feed back the R. F. course, the terminal of the R. F. circuit | component to build up the signal for the may be connected direct to minus filament instead of to positive "B" battery, as the path through the batteries is of no advan- but as an amplifier. The plate circuit tage to the R. F.

> Such a choke usually consists of from 250 to 500 turns of small wire, about No. 26 or No. 28 wound on a 2 or 3 inch form. This is a high resistance or reactance path to R. F., but amounts to only a small proportion of the D. C. resistance of the receivers for the B current.

#### Rejector Circuit

Sometimes in reflex sets where the A. F. and the R. F. are inextricably mixed up the A. F. The first feed-back is shown in various parts of the circuit, they can by the full heavy line, and we ignore the be routed correctly by means of condensers and R. F. chokes, and a set otherwise a failure may be made to operate well. Such | ignore the full black line. a device is not common, but it is met with frenquently enough to deserve some study and experimentation. Turning the choke, of course, will effectually block certain undesired frequencies. In such case the coil is usually of less turns, a condenser is connected in parallel with it for tuning, and the whole thing is given the high sounding name of a "rejector circuit." It is used as a wave trap in a case where it is desired not to get a particular frequency; as, for example, suppose WJZ has their watch listening for 600 meters while the program is on to hear any SOS. For some reason, suppose that their own program, because of proximity of the antenna and leads, drowns out everything on the watcher's set. In order to cut out their own station a rejector circuit tuned for 455 meters would be used. An "acceptance circuit" for 600 meters would not be desirable for the reason that, while it would facilitate the reception of 600 meters, it might not cut out 455 meters.

It is apparent, therefore, that a tuned coil may be tuned for the purpose of facilitating the receptance of a certain fresome certain other frequency. In our circuit to other frequencies we depend frequencies. Under some conditions, however, a specific frequency may disturb us regenerative detector according to the at all times. Then we would build a re-Weagant X circuit. The coil L may be | jector circuit to always cut that frequency

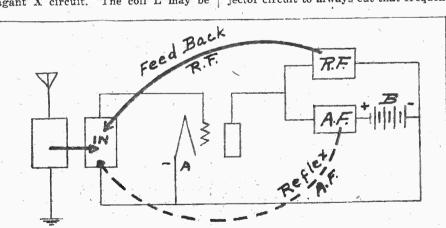


Fig. 1: The difference between reflex and regeneration

a separate coil or it may be the whole | out. That, of course, is the principle of or a portion of the primary coil, as in some forms of the Reinartz. Condenser C is in series with it and tunes the plate circuit with reference to the radio frequency component, so that the plate and grid circuits approach the condition known as resonance, where the tube gives its best volume and its greatest selectivity and sensitivity. This condenser C blocks the B battery voltage from reaching the plate and no direct current will pass through it.

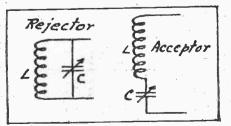


Fig. 3: An illustration of parallel and series resonances

A parallel circuit is provided for the headphones, and in this circuit the B battery current flows. A radio frequency choke coil may be inserted in series with the phones and no R. F. current can pass | two components in the plate circuit of a | and the signal disappears.

"filter" systems that we hear mentioned so

A rejector or filter is almost always a coil and condenser in parallel interposed between the part of the circuit which has the undesired frequency and that part of the circuit where you don't want this frequency to flow. Such a filter does not prevent other frequencies flowing. An acceptance circuit, on the other hand, is best made with the condenser and coil in series, in which case the tuning makes the path of practically zero resistance for some one frequency, but of high resistance for other frequencies. . The practice in radio sets, however, has not altogether followed this theoretical relation, although antenna circuits when tuned are usually tuned by a series condenser.

We might stop here long enough to look again at Figure 1, this time at the heavy dotted line which the writer put in to indicate the real difference between the reflex circuit and the regenerative circuit. As stated above, there are always the tion takes place. Then the tube squeals, at the frequency for which the condenser

regenerative effect. In the reflex circuit, we do not have the tube as a detector, contains only R. F., and we put in a crystal usually, sometimes a tube, to rectify this R. F., that is, to get rid of the carrier wave and have simply the voice changes. This gives us A. F., which we feed back to the input and amplify again with the same tube.

Substantially, then, in both cases we have both R. F. and A. F. in the plate circuit. In the regenerative we feed back the R. F., and in the reflex we feed back dotted line. In the second case the feedback is shown by the dotted line, and we

It is obvious, I think, that we may take the R. F. which we feed back in the regenerative circuit, and rectify it and feed it back through an audio transformer as A. F. That is, we can rectify this slight component of R. F., if we wish, on the way back to the grid circuit. The difficulty of doing it is the difficulty of making a tube act both as a detector and as an audio amplifier at the same time. We would require a separate tube for amplifying the rectified feed-back R. F., and the output of that tube would be amplified A. F. to be added to the A. F. already in the detector circuit.

An R. F. amplifying tube gives us exactly the same trouble. When we have R. F. amplification it is easy to cause the tubes to oscillate because of the feed-back action between the grid and plate wiring

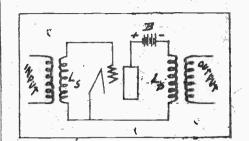


Fig. 4: A standard vacuum tube amplifier circuit

and between other parts of the grid and plate circuits. The bigger the coil in the plate circuit the easier it is to start this oscillation. To get rid of the oscillation, we can abstract from the plate circuit enough of the energy that would otherwise be fed back, so that the tube will not oscillate; or we can add resistance enough to one or the other of the circuits so that it will absorb the energy in its circuit, and there will not be enough to feed back; or we can so bias the voltage on the grid that the tube will not amplify sufficiently so that the output is great enough for any energy to spare.

A tube which will give a greater output than its input will always oscillate. A tube which will not give a greater output

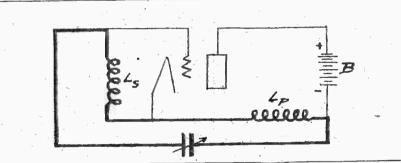


Fig. 6: A standard oscillator circuit

tube. We impress on the grid certain varying voltages. These are the received signal voltages. The grid varies from minus to plus and plus to minus. That is, there are changing pressures on the grid. These changing pressures interrupt the flow of electrons to the plate. The interruptions of the stream of electrons from filament to plate constantly changes the resistance of the path of the plate current flowing from the "B" battery from the plate to the filament. When there is a maximum flow of electrons the resistance of the path from plate to filament is a minimum. When the flow of electrons is cut down, the resistance is a maximum. The changing resistance causes corresponding changes in the plate current flow. As the resistance changes | 5. Now, as much of the output goes back with the grid voltage variations, so the into the input as the coupling and proplate current variations change with the portions of the coil allow, and the tube grid voltage variations. We are therefore getting current variations in the plate circuit which correspond to the signal received by the grid. While the grid variations may be slight, because of the tube design, the plate current variations are much greater, as much greater as we want to make them within the limits of the tube.

It is therefore apparent that the tube output is greater than the tube input, and we could take some of the output and run it back to the input. We might even take enough from the output to drown out the input, and then the grid variations would no longer be those of the signal. In fact, the signal could be entirely disconnected and the tube would go on working, the energy being supplied by the "B" battery. We have got the tube in a condition of self-oscillation, and the grid variations now rould gradually change until the frequency became the easiest frequency to pass through the

In handling a regenerative detector, if we tune the plate too closely to resonance same frequency is assured in both the with the grid circuit, we feed back more and more of the output until we are feeding back so much that this oscilla-

Let us review briefly the action of a | than its input cannot oscillate by itself. An amplifier must have a greater output than input, so an amplifier will oscillate. From this rather non-technical statement of the case it is apparent that a tube which does not oscillate will not amplify. As long as we have amplifiers it seems almost certain that we will have oscillations and squeals. The squeals, however. come from wrong handling of the tubes,

What I have just said is shown in the diagrams, Figures 4, 5 and 6. In Fig. 4 is the standard tube hook-up with a certain frequency of input coupled to the coil Ls and the output coupled from the coil Lp. Now, suppose the output is coupled back again to the input. In effect it is the same as though coils Ls and Lp are coupled together magnetically as in Fig. will oscillate.

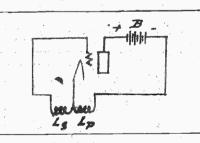
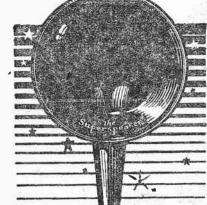


Fig. 5: A method of radio frequency feedback

To control the amount of oscillation, however, the plate and grid circuits should be tuned. If they are tuned to resonance, that is, if each circuit is tuned to the same frequency as the other, a maximum oscillation will ensue. In Fig. 6 we have this condition. In order to control the circuit Ls and Lp are no longer magnetically coupled, but both are included in a single tuned circuit with a condenser, which is shown by the heavy line. The entire circuit being tuned, the coils. Then one being in the grid circuit and the other in the plate circuit, we know that the tube oscillations will be



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### Reminiscences of A Broadcasting Pioneer

By Frank Reichmann resident, the Reichmann Company

The radio listener who now sits back and catches the music, talks and election returns has littlefi if any, conception of the early troubles of the broadcasters, or when broadcastng was first attempted in Chicago.

Wireless broadcasting has been ontinuous and on a very high plane n Chicago for some four or five years, but the first broadcasting ever done here or any where else in the United States in the way of giving regular programs, took place in 1912, It was wired broadcasting, but it paved the way for the present day entertainment over the air.

Carl Winkler, a former Chicago newspaper man, and myself went into broadcasting as a business in cooperation with the old; and now defunct, Automatic Telephone System. We rented a studio on the top floor of the Westminster Building and got under way. In those days people did not take to dialing their telephone with a Jewett numbers and foregoing the opportunity to cuss the operator. The Automatic needed publicity and friends, and Winkler and I started out to get both, along with some financial return

A loud speaker was devised and installed in more than 300 homes of persons who had automatic tele-phones. In return, these subscribers It certainly was service. We gave and Al Jolson to talks on dehydrating garden vegetables.

Carbon Button Relays There were no flame microphones in those days and we had to get by as best we could with the old carbon button relays. Tubes were scarce and we had to get amplification by attaching a carbon button to each instrument in our orchestra.

But in spite of all these handicaps, the service grew in popularity. They even talked about putting special taxes on us. They didn't seem to realize that we were having plenty of troubles of our own. Included in these troubles was a growing determination of the entertainers to make us pay for their services.

The subscribers, who could stand or the broadcasting, didn't have nearly so much trouble. In fact, the installations in the homes very rarely got out of order. The bell ringer circuit of the telephone was opened and the loud speaker hooked into it. The twist of the key, closing the switch in the ringer box, established a direct connection with the studio.

If central rang on the line during concert, a buzzing was heard above the other noises emanating from the loud speaker. The listener lifted the receiver from the hook, thereby cutting out the ringing circuit and the loud speaker and carried on his or her telephone conversation.

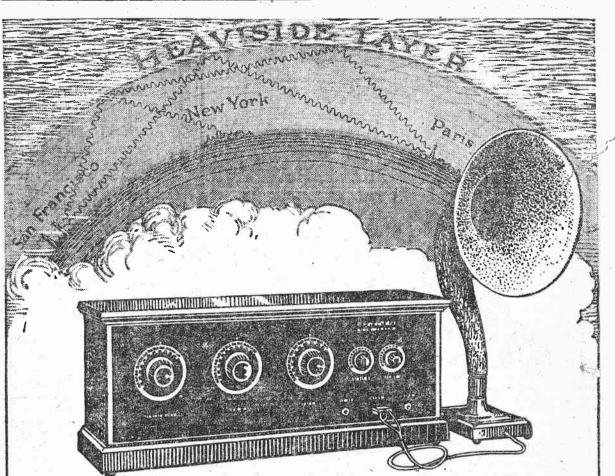
Coin Boxes Used

We also worked a variation of this cheme by installing loud speakers in saloons and working them by means of coin boxes. Any patron of the saloon who got geared up to the stage here he could stand almost any kind of punishment, would drop a nickel in the slot. This would flash a signal to a girl who sat at a switchboard in our studio. She would plug in on the line, toss a record on the phonograph and the result would be transmitted

to the saloon. The collection of the nickels had a great deal to do with the slightly subsequent closing of America's first broadcasting station. The nickels had to be collected and in those days there were temptations confronting the collector. In fact, the beer man, the ice collector, the men who sold the free lunch and all other material to the saloonist, were all supposed to decorate the mahongany when a col-

To get proper amplifications, we had to depend on a high voltage to give the initial impulse. Along in July, 1913, one of our singers who insisted he couldn't work without a make-up, got his hav whiskers tangled up with a loose connection in the apparatus, and when the fire department had done its work the building management canceled our lease.

On summer evenings I like to tune in a distant station and listen to the wails and hisses of the static. I reminds me so much of what we used to get \$5 a month for from our subscribers. And back of it all is the thought that out of this experiment has come the greatest and most popuar form of entertainment.



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Mr. C. S. Tunwall, of Fort Dodge, Iowa, reports loud speaker reception of PRPP Paris, France and YN Lyons, France.

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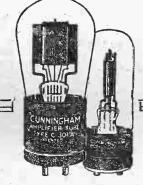
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HERALD TRIBUNE RADIO MAGAZINE

### 21 Stations To Broadcast Inaugural Hear the Formt-

The inaugural ceremonies to be held at Washington at noon, March 4 will be broadcast for the first time in history through a chain of stations from coast to coast. Microphones installed at different locations on the platform which is to be erected on the steps of the Capitol will "pick up" each word and carry it through a public address system, in order that those witnessing the event may In addition to serving the loud

speakers of the public address system the spoken words of those taking part in the inaugural ceremonies will be transmitted by the long distance telephone lines of the American Telephone and Telegraph Company to their broadcasting station WEAF in New York City as well as the follow-ing stations: WEEI, Boston, Mass.; WJAR, Providence, R. I.; WTIC, Hartford, Conn.; WOO, Philadelphia, Pa.; WCAE, Pittsburgh, Pa.; WGR, Buffalo, N. Y.; WEAR, Cleveland, Ohio; WLW, Cincinnati, Ohio; WWJ, Detroit, Mich.; WMAQ, Chicago, Ill.; WDAF, Kansas City, Mo.; WHO, Des Moines, Iowa; WCCO, Minneapolis-St. Paul, Minn.; WSB, Atlanta, Ga.; KFI, Los Angeles, Calif.; KPO, San Francisco, Calif., and KLX, Oakland, Calif The proceedings will also be broad-cast by the Radio Corporation of America through stations WRC, Washington, D. C.; WJZ, New York, N. Y., and WGY, Schenectady, N. Y. It is very likely that other stations will be added to this list of broadcasting stations which will transmit this notable event into the ether for the benefit of a vast radio audience who otherwise would be unable to participate.

Graham McNamee, one of WEAF's popular announcers, will give his familiar "Good morning, ladies and gentlemen of the radio audience" to the chain of stations connected with WEAF at approximately 11:15 a. m. from his position on the platform, and after a brief description of the local color about him, will introduce to his listeners the United States Marine Band, which will be heard until 11:57. At 11:58 a fanfare of trumpets will call the assemblage to order, and immediately the justices of the Supreme Court will approach the platform, followed by the Chief Justice, Cabinet members and President

At high noon the President momentarily ceases to hold the office of President of the United States, but at the next moment takes the oath of office for the term of four years. Following a short prayer President Coolidge will address the multitude, not only visible but invisible, and at the conclusion of his address the United States Marine Band will render "The Star-Spangled Banner," bringing the ceremonies to a close.

Sherwood Anderson on the Air With 'The Triumph of the Egg' A dramatic radio offering on Tues day at 10:30 p. m. will be the presentation at WGBS of the dramatic verion of "The Triumph of the Egg," by Sherwood Anderson, which the Provincetown Players are giving for a limited engagement at their Mac-

dougal Street theater. The main part is taken by John Huston, the eighteen-year-old son of Walter Huston, who is, incidentally. scoring a success in another Provincetown production, "Desire Under the Elms." Others in "The Triumph of the Egg" are John Taylor and Jean-

Before the play Sherwood Anderson will give a short talk concerning the nature of the piece and similar

Famous Violinist Joins WJZ
The management of the broadcasting division of the Radio Corporation of America announces the addition of Godfrey Ludlow, famous concert vioinist, to the staff of stations WJZ and WJY, New York City. Mr. Ludlow will act as assistant to the manager in the preparation of musical proadcasts and will be heard in special WJZ and WJY recitals, accompanied by Keith McLeod, musical director of the stations, at least once

Data on a French Station The broadcasting station of "Petit Parisien," Paris, France, radiates on 345 meters with 500 watts power. Concerts are put on the air regularly on Sunday, Tuesday, Thursday and Saturday from 9:30 to 11 p. m. Greenwich Mean Time.



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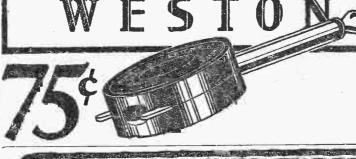
Actually, you can change from one set of cord tips to another on a genuine Weston Plug in less than 3 seconds-without screw driver, pliers or any other tool,

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Cord tips simply push into the plug and you can't pull them loose until you press the release-triggers.

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In a Variety of Styles and Sizes

### Up-to-the-Minute News of Radio in Pictures



Base of Giant Antenna Tower 836 feet high near Berlin, Germany . MADEL & HERDERS,

## New Fields Open for Development in Science of Radio Signaling

An Address Delivered Before the American Institute of Electrical Engineers in Cleveland, Ohio

By E. F. W. ALEXANDERSON

Chief Consulting Engineer, Radio Corporation of America

RANSOCEANIC communication has always been the force that developed and maintained great civilizations. In classical times the great commonwealth of the Mediterranean was held together by speedy ships communicating with Rome as a center. The modern commonwealth of the Atlantic Ocean has been held together by the telegraph cable system centered in London. The scene is now shifting and New York

is becoming the financial and commercial center of the world. New York now has a well developed new system of communication reaching all parts of the world by radio. It is the growth of this world system of radio communication which I wish to bring to your attention. The Radio Corporation of America started operation in 1920, but the system of communication has already autgrown the experimental stage and become a public service on a large scale. It is difficult to convey by words the appeal to the imagination which the development and operation of this worldwide spiderweb of communication has to those engaged in it. We had to develop transmitting stations and antenna systems, high frequency alternators with accurate speed control, high speed modulation of the antenna current, high frequency insulation withstanding voltages higher than those used in any power lines, etc. Atmospheric disturbances have been conquered by an antenna system capable of receiving all the different signals from all parts of the world, concentrating the operation of the whole system in one large room in New York.

The aims of the engineers responsible for this system are largely the same as those operating a railroad: reliability, service and speed. Such service now is being rendered, but this does not mean that the development of the radio technique with relation to communication has come to a standstill any more than we have a right to say that the steam locomotive will not be replaced in time by an improved form of tractive power. It does mean, however, that one of those phases has been reached in radio communication which occurs in any engineering development, that the technique has, after a strenrequirements and has a breathing spell getting ready for new efforts. This stage was reached by the marine steam engine before it was replaced by the steam turbine. This stage also has been reached in electric power engineering. This is the period when the technical achievements of the past are capitalized and exploited. Technical development work is always done at a loss in the initial stages. If the engineering art did not have these breathing spells it could not proceed, because, in the first place, the source of financial support would dry o.t, and, in the second place, the engineers would be tied down with details and would not have time for

#### Broadcasting More Stable

the fundamental research which paves the

way for the next advance.

Radio broadcasting has also within the last year settled down to a public service and a profitable field for commercial exploitation. The technique has reach such a degree of perfection that the greater part of the public is interested in radio because of the artistic enjoyment, information and education which it renders. rather than for the chances for experimentation and invention which it offers. There is, however, a large and growing group of amateurs who pursue radio for the love of the art, and the art to them is not the performance in the stduio, but the technical art of radio itself. Radio has enjoyed a greater following of amateurs than any other branch of engineering, and it is the thought of these amateurs that molds the future. They are one step closer to reality than the imaginative writers like Kipling and Jules Verne. who give us glimpses of the future long before they can be realized. The amateur likes to anticipate what advances in the art may reasonably be expected within the next decade.

When we try to anticipate the next | absorption. So long as we are working | the cold facts of to-day always lead to account of what new knowledge we have asquired in the last few years which we hope to exploit. The present-day radio communication utilizes long waves. The propagation characteristics of those long waves has been thoroughly explored, and we know how much radiated energy is needed for communication over any distances day and night. We know how to build radio transmitters and antenna systems, and we have learned how to control the effect of atmospheric disturbances under practically all conditions.

The long wave follows the surface of the earth and is subject to laws of attenuation, which are by this time well understood. In the broadcast range of wave lengths, on the other hand, there is considerably more irregularity. Signals sometimes go through and sometimes not, depending upon phenomena which are not under our control. Sometimes extraordinary distances are covered with very low

During the last year a number of longdistance communication circuits have been introduced utilizing waves below 100 meters. Such circuits are now in operation between New York and Europe, New York and South America, and San Francisco and Hawaii. The adoption of short waves for communication over long distances is contrary to the earlier well established experience, in which it has been found that the longer the distance, the longer should be the wave length for giving reliable service. There are many indications that we are in the short wave field dealing with phenomena of wave propagation quite different from those encountered in the past. This new field of knowledge is being explored and promises to open up new and unexpected fields in radio.

### Short Waves Do Not Follow Surface

The short waves do not follow the surface of the earth, and we have learned to launch the wave like a high-angle gunfire into space in such a way that it travels | the trans-Atlantic and trans-Pacific telein the upper atmosphere and comes back | graph traffic of the world. To carry a to earth a great distance away. By uous effort, caught up with the commercial | traveling on this upper track the waves | seem fantastic, but attempts at stating

substantial advance we must first take with earthbound waves we must use long waves for long distances, because the earth absorption of the long waves is comparatively small. When, on the other hand, we use high-angle radiation with short waves we utilize a different form of wave propagation. These new tracks in the ether are being explored by systematic research work as well as by commercial communication.

> Thus a new phenomenon or law of nature has been established, though we are not yet able to give an adequate explanation. The old theory of the Heaviside layer as a conducting and reflecting surface does not fit the phenomenon, as observed, but there is a more promising theory recently advanced by Sir Joseph Lamor explaining the curvature of the wave by a change in the refractive index of space caused by the presence of electrons in the upper atmosphere.

> It took many years before we mastered the technique of the earthbound waves, so that we can now count on continuous and reliable communication. The curved space radiation with short waves will undoubtedly open up new and important fields for radio. We are utilizing it already in commercial traffic, but it will probably be many years before this is as thoroughly understood.

#### Possibilities of Short Waves

The short wave lengths open up not only new paths for wave propagation, but give us an almost inexhaustible scale of wave lengths, provided that we utilize it to full advantage. The following facts will make this clear. Almost all the transoceanic telegraph stations in the world are crowded into a wave length band 10,-000 cycles wide. This space in the ether is utilized nearly up to its ultimate capacity, but the short wave field below 100 meters includes 10,000,000 cycles, thus there is room for a thousand times as many messages as all the long wave stations put together, and those stations are at present capable of carrying all thousand times as many messages would are not subject to the ordinary laws of our dreams of the future in terms of

### Bloops and Static

---By STEPHEN L. COLES-

ROADCAST listeners on the New | According to reports received by the Europe. These signals are then auto-York and Connecticut shores of Radio Bureau of the Department of Communically separated in more than a dozen of spark interference with their evening programs. Some of them think the interference comes from the Sound steamers and contemplate united action to secure its abatement, whatever its source may be.

The Bizet music which opened the Philharmonic concert last Wednesday evening was most pleasing to this writer, who admits his musical ignorance of the modernistic, futuristic, grotesqueries of freak compositions such as Casella's "Italia." Before the concert opened Graham MacNamee, of WEAF, warned his radio audience that the Casella efforts were 'so modern in their tendencies that they probably would be appreciated and understood only by future generations. For our part, they should be saved for that audience. There are so many really enjoyable compositions that to make a Mrs. Jarley's Waxworks out of a musical program is to search for and set up the unnecessary. Any composer who specializes in a twelve-note octave doesn't get our vote. The orchestra tuning up pleased us better than the Casella Opus 11. We at least understood what that was all about.

The publicity man for a nearby broadcasting station supplies a new one-he describes a refurbished studio as "palatious." This strikes us as "delitious."

Long Island are again complaining | merce, the announcers of some broad- | receiving sets and sent by wire lines to casting stations continue programs for long periods without giving the call letters of the stations. As some of the call letters are not readily understood, the suggestion has been made that a method be adopted which will make identification more positive. It probably will be helpful if when making an announcement the call letters of a station are followed by the name of the city in which the station is located. It would no doubt be appreciated by the audience if the announcers would mention distinctly the call letters and name of the city at somewhat regular intervals.

Our remarks on the multiplicity of program features now clogging the air has moved Dr. Johnston, of Newburgh, N. Y., to write as follows: "Allow me heartily to sanction your view. More and more I am becoming disgusted; it seems that there is nothing but jazz and awfully toor singers. Reception is also getting worse and worse. Now, half of WGY's organ broadcast sounds like a horse and wagon driving over a bridge."

"Roxy" (S. L. Rothafel) and Raymond Francis Yates have written a book on modern broadcasting which is scheduled for publication about March 15. It should "go big" with the radio audience, which doubtless will rise from its invisibility long enough to purchase many copies.

a thousand times as many messages, and if we did they would be of a very different character. But we have a new tool to do things with, and we must use our imagination as to what to do with it.

Two years ago Owen D. Young, chairman of the board of directors of the Radio Corporation and of the General Electric Company, stated his conception of what radio ought to accomplish. He wished to press a key and-zip!-a whole page of a newspaper would be flashed across the ocean. Acting upon this lead, we went ahead to see what could be done. and in less than two years we had demonstrated picture transmission across the ocean. There is a long way between the transmission of a picture and the flashing of a whole newspaper, but the art is rapidly moving in that direction.

#### Advances in Past

An inspiring thought is always many years ahead of the event. As an illustration of this I wish to mention an important advance in radio which was conceived of long ago and has now been realized. In 1912 I visited the laboratory of Mr. John Hays Hammond jr. to make tests of two alternators of 100,000 cycles which he had purchased and installed, and we had some, to nie, very inspiring conversations. We discussed the modulation of the antenna current, trans-Atlantic telegraphy and telephony, control of airplanes and submarines, and Mr. Hammond outlined his idea of taking a variety of messages and scrambling them together, superimposing them on one transmitter and sending them forth by radio as a composite message, and then again unscrambling them into separate messages.

Now, after twelve years, we find a paper presented to the Institute of Radio Engineers by Beverage, Hansell and Dean which tells just how this is done and explains the theory of the apparatus and its operation.

This is what happened in the mean time: The fight against atmospheric disturbances and static has led us to build on Long Island a central receiving station with an antenna system consisting of two antennas, ten miles long, joined by a transmission line. This seems like a large equipment, but its cost is insignificant in comparison with the service it renders. This antenna system, known as the Beverage-Rice system, eliminates practically all the static and intercepts on one antennà all the signals from all the stations in the operating room in New York.

### Eliminating Static

There is only one kind of disturbance that this system does not practically eliminate, and that is a thunder storm in the neighborhood of the station right on the line from which the signals come. To insure service even in this contingency, a similar large antenna system was built at Belfast, Me., which would be immune to a thunder storm on Long Island, whereas a station on Long Island would be only slightly affected by a thunder storm in Maine. But the problem was how to get the signal down from Maine to Long Island. The authors of this recent paper show how, by much painstaking work and many ingenious new inventions, this has been done. thereby realizing Hammond's dreams of years ago. The signals from Europe are picked out of the ether in Maine, scrambled together and sent out by a single transmitter. This composite signal is then received on Long Island and unscrambled into a dozen signals, which are fed into the long wave receiving sets, where they go through the usual process of detection and transmission to New York. The signals so reproduced are exact replicas of the original signals, so that the operators in New York do not know whether they have received the original signals or the scrambled and unscrambled signals via Belfast, Me.

### **Answers to Questions**

Home-Made Loud Speaker

Since the publication of the description of a cone-type loud speaker in the Herald Tribune Radio Magazine of January 4, by Ralph C. Powel jr., a number of readers have written for further details of its construction. The speaker, while comparatively simple to construct when the idea is understood, was difficult to describe. Answers to the many questions are included in the following information:

Most of those who wrote experienced trouble in changing the Bald- lengths below 100 meters. Is there win unit for use with the cone. any advantage in building a receiver Accordingly the drawing accompany- especially for the reception of such ing this second description is made stations? more in detail. In order to under- Answer-At present there are only stand the action of the cone it is two broadcasting stations operating necessary to examine the unit. It on these bands, namely, KDKA and consists of a circular permanent WGY. Since these stations broadcast magnet at the ends of which are the same program on their regular attached two U-shaped pieces of iron assigned wave length there is no

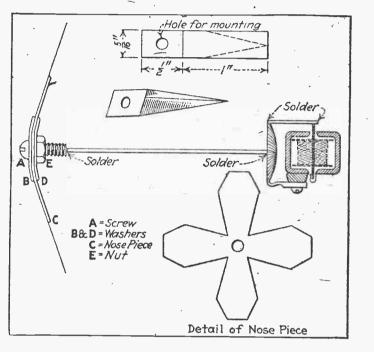
side or loosening the screw which holds it to the support.

### C Battery Connections

A. E. Cohen-Which terminal of a C battery is connected to the transformer and which to the filament? Answer-The negative to the grid and the positive to the filament.

Reception on Short Waves F. B. Hartley-The writer notices there are a number of prominent

which form the pole pieces. Within particular advantage in building a



#### Constructional data on cone-type loud speakers

one-half an inch square. This is nals it is well worth the while. supported by two pins in the center, enabling it to move back and forth like a seesaw. A pin running to the diaphragm of the unit holds this as good as an outdoor antenna for armature in the center between the local reception? two pole pieces. A current passing through the coil causes the armature to vibrate and in turn vibrates the

This same principle is used in the heard. speaker in question except the vibration of the armature, instead of being impressed on the diaphragm directly, is used to operate the movable arm referred to in the previous descrip- in an audio amplifier? tion, and this in turn operates the

struction of the movable arm.

by 11/2 inches, is cut. One-half inch | signal. from one end it is bent so as to form a right angle. On the long leg oneall inch from the bend cut so that fastened to the end of the permanent ly appreciated if the diagram could magnet through the screw provided be published again. so that the long leg extends toward the center of the unit. The end shown. The method of making this of a pin as shown in Fig. 2. The remainder of the construction is described fully in the previous article.

Some readers ask if units other than the Baldwin may be employed, There are a number of loud speakers in the market, such as the Bristol Audiphone and Western Electric horn. which employ the same type of unit, and these may be used after being changed in the manner described.

The brass piece in the nose of the cone is used only to add stiffness to the cone at the point where the power is applied. Blotting paper was used for the

cone because it is readily available. mica or some other insulating mate-Any kind of heavy paper may be used rial. A piece of copper foil is then for the cone, such as that used as rapped around the dielectric and fasthe cover of pamphlets or parchment. tenede securely by binding with wire. Changes in temperature will cause | This is then covered with wax. With

these two U-shaped pieces a coil is | set particularly for the reception of mounted which forms the winding of these signals. There are, however, the unit. A slot is provided through a number of code stations operating the center of the coil in which is on these bands, and if one is intermounted a thin steel armature about ested in the reception of such sig-

### Indoor Antenna G. H. Keep-Is an indoor antenna

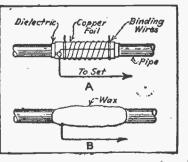
Answer-In most cases it will be found that an indoor antenna will give as good results as an outdoor diaphragm, which makes the sounds aerial for local reception. If properly constructed distant stations may be

> Amplifier "B" Battery Voltage F. W. Wilson-What is the most desirable "B" battery voltage to use

Answer-From 45 to 90 volts and 100 volts if a "C" battery is em-Fig. 1 shows more clearly the con- ployed. The greater the "B" battery voltage on the audio amplifier the A piece of No. 28 sheet brass, 5/16 greater the intensity of the received

#### Efficient Ground Connection X. Y. Zeigler-Some time ago I noit tapers to a point at the end of ticed in your Radio Magazine a novel the long leg. Drill a one-eighth- yet efficient method of attaching a inch hole in the center of the short wire to a water pipe for a ground leg and pinch the sides of the long leg | connection. As this copy of the magtogether, V-shape. This piece is then azine has been lost it would be great-

should come just beyond the end of connection is by first rapping some the pole piece. The arm may then form of dielectric around the pipe. be fastened to the armature by means The dielectric may be waxed paper,



Constructional details of a capacity

the cone to expand and contract and such a ground connection a medium thus change the adjustment of the size antenna must be used in order unit. This may usually be compen- that the fundamental wave length of sated for by swinging the unit to one the antenna may not be too low.



VEN the lay public now realizes that with all the talk about revolutionary developments, the leading receivers of the day all follow similar standard prac- Blue Glass, Pure Bakelite Bases untices and usually employ from 5 to 9

Therefore, tubes which function equally well in any socket in any set decide the maximum of tone and quality to be expected from any re-

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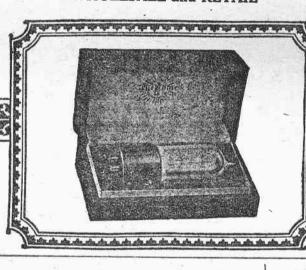
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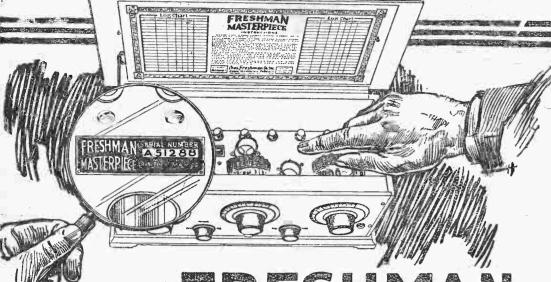
choose or what part to buy (information varying according to your purse, location, etc.), is at your command. In short this triple seal protects you.

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this page. It is certain to perform-magnificently.

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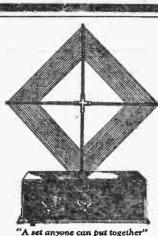
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### **Eclipse Radio Data Disappoint**

Bureau of Standards Scientists Find Nothing New on Broadcast Band

By THOMAS STEVENSON

band between 200 and 545 meters during the period of total eclipse

Tests at the Bellevue Laboratory, however, on high frequencies or low wave lengths were different. Several unusual things happened on these attributed to the eclipse.

coming in particularly well. There

Forty-Meter Tests

It seems that the greater the dis-

Another interesting fact reported

To Eliminate Howls

The frame of an audio-frequency

At the Bureau of Standards Dr. anything happened it would be on ing effects, while Dr. Parkinson to dark during the eclipse. On the sought to determine the effect of to- band between seventy-five and eighty tality on directional qualities.

two days after the eclipse.

"Apparently nothing happened on on 70 meters strong fading is exthe day of the eclipse that could not perienced in the day time with strong have happened any other day," says signals at night, with exactly op-Dr. Jolliffe. "There was a lot of long posite conditions on 40 meters. period and rapid fading which is During the eclipse the Bellevue characteristic of some broadcasting laboratory had two transmitters in

operation, one of 711/2 meters, with there was a break in signal recepother on 40 meters, with 100 watts tion which may have been due to the in the antenna. eclipse. I am inclined, however, to "Just prior to the beginning of the think it was due to transmission eclipse," says Dr. Taylor, "the amatroubles, or else everybody at the teur stations on the band, from 75 to broadcasting station went out to 80 meters, were rolling in from watch the eclipse. everywhere and distant stations were

Tests After Eclipse

were one or two 40-meter stations "The record on the day following coming in, but only from great disthe eclipse shows what might have happened during the eclipse. The to 80 meter stations came in very tances. During the eclipse the 75 signal intensity went up and down, there was fading all the way through and every other condition which we might have expected during the eclipse." eclipse."

"There was no conspicuous rise or drop in signal intensity," says Dr. "On 40 meters there wasn't much Parkinson. The weather was quite doing before the eclipse. The signals cloudy on the day of the eclipse, of most stations were as dead as a which might be responsible. I lis- door nail. After the eclipse the 40tened in on Springfield, and, strange meter stations began to come in to say, there were greater variations | finely." on the day after than on the day of Dr. Taylor said there is a station the eclipse." at Hartford on 54 meters with which

Dr. Parkinson asserts the record he has worked every day. During on directional effects was not com- the eclipse he could not pick up the plete enough to make a prediction as signals of this station, but they were to whether the eclipse had any ef- heard in Florida very well.

According to a report to the Bu- tance the better the reception on the reau of Standards from G. W. Pick-ard, who initiated the eclipse obser-the signals of a 40-meter station can vations, a big increase in signal in- be heard much better at 5,000 than tensity for nine minutes during the at 500 miles. eclipse was noted. Mr. Pickard was As an example, Dr. Taylor asserts at Ithaca and was taking observa- that the signals of the 100-watt tions on the signals of WGR, Buf- transmitter working on 40 meters falo. It is believed that the rise was were picked up at Santiago, while due to the eclipse. they could not be heard at Savannah.

Dr. A. H. Taylor, in charge of the Bellevue laboratory, observed the were picked up just as well at Santihigh frequencies and reports some ago as were those of the 9.000 watts

transformer may be grounded to rid "However, out at Bellevue, we did the set of howls caused by magnetic not feel that anything of a striking feed-back or intercapacity action. nature would occur during the These eddy currents are short-cireclipse. We were convinced that if cuited to the ground.

Compact Radio Picture Sending Device

In the picture above are shown, from left to right, C. Francis Jen-

kins, of Washington, D. C., and his assistant, J. Robinson, who have

developed the compact device seen in the foreground for sending picpictures by radio or wire. It is stated that the new apparatus will send

one picture while receiving another from a distant station.

CIENTISTS at the Bureau of Standards are rather disappointed with the results of observations on the effect of the eclipse on radio transmission and reception. Their tests on the broadcast revealed nothing which could not occur and has not occurred on any

C. B. Jolliffe and Dr. T. Parkinson had the high frequencies. charge of the observations. Dr. Jol- "On the high frequencies there was liffer observed particularly for fad- a complete change over from daylight

meters the signals in some cases Dr. Jolliffe listened in with a pow- were a hundred times stronger durerful set with which recording was ing the eclipse than just before or accomplished by a galvanometer. Ob- after." servations started at 7:30 and lasted Dr. Taylor reports a very interestuntil 11 a. m. two days before and ing change in conditions on 40 meters as compared with 70. It seems that

"Just before the period of totality 9,000 watts in the antenna, and the

fect on this phase or not.

Dr. Taylor's Observations

"I took some observations on two It is Dr. Taylor's conclusion that English stations," says Dr. Taylor, "and found nothing that could be called peculiar about eclipse effects.

"For a short time during the eclipse I listened in on Cincinnati. During the eclipse the signal intensity increased ten-fold and after the eclipse the signals faded completely

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Your Radio Socket Must Have These Exclusive Advantages: 1. LOW LOSS. Laboratory tests in a leading university proved that out of 13 best
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the ONLY ones having losses lower than
a good low loss condenser.

2. POSITIVE SIDE-SCRAPING contact (not just side pressure) that cleans corrosion from tube terminals. Only Na-Ald Sockets have this essential feature.



### ULTRADYIE KIT

Model L-2 KIT CONTAINS:

- Special Low Loss 180 degree Sensitizina Coupler. 2.—Oscillator

Coil. Tuning Coil.

.-Ultraformers (1 type "A," 3 type 5.-Four Fixed Condensers.

APPROVED

LACAULT HEATH RADIANT **CONDENSERS** 

Heath Condensers are adaptable to all circuits



No. 1093 REGULAR TYPE TERMINALS -.00015 MFD....\$.25 maye . . .0005 .... .35 .002 .0025 35 .45

.004

.005

...1.00 .01 No. 1095 with MOUNTINGS for GRID LEAK .00015, .00025 or

.0005 MFD..... .35

**NOISELESS DEPENDABLE** PERMANENT

**EFFICIENT** ACCURATE

No. 1103 with **BINDING POST TERMINALS** .00015 MFD......30 .0005

**TESTED** 

.001 .......40 .0025 No. 1105

with MOUNTINGS

for GRID LEAK

.00015, .00025 or .0005 MFD. . . . .40

## FRESHMAN

5 TUBE TUNED RADIO FREQUENCY RECEIVER



The Greatest Value Ever Offered in a Radio Receiving Set

### See!

Even the inexperienced amateur can see why radio experts praise the New Model "C"

For Better Radio ammarlund CONDENSER

Standard on

30 Leading

Radio Sets



Specially Processed for Radio Black-Mahogany-Walnut Finishes. Furnished in standard sizes in envelopes.



.45 .55

Price \$1.10 each.

MPERITE means right amperes





Gear Ratio 20 to 1.

The PACENT RHEOSTAT Accurate Control

Longer Tube Life One of the well-known

Pacent RADIO ESSENTIALS

endezvous for celebrated stars of

This evening, at 6:30 o'clock, the

new station will get under way offi-

cially, and the program marking its

or later. A host of Broadway's lead-

ing figures have accepted invitations

to be present and participate in the

functions marking the inaugural.

The event promises to be memorable

The new station is WMCA, owned

and managed by the Hotel McAlpin,

at Broadway and Thirty-fourth

Street, New York. It will operate on

a wave length of 428.6 meters and will

hours a week. Its keynote will be

e on the air approximately fifty

To-night there will be four masters

f ceremonies-Irvin S. Cobb. the

ournalist and author; Walter Cat-

ett, star of "Lady, Be Good"; Harry

Hirshfield, father of Abie Kabibble

and president of the Cheese Club, and

Ed Squires, the globe-trotting an-

At the suggestion of Dutee Wilcox

Flint, George Spink, director of en-

tertainment for Station WDWF,

Providence, R. I., is organizing a club

to be known as the "Radio Announce

ers of America." The first meeting

will be held at the Biltmore Hotel in

Providence on March 2. Announcers

of the United States and Canada will

be invited, among them S, L. Roth-

afel ("Roxy"), director of the Cap-

itol Theater, New York; Graham Mc-

Namee, announcer of Station WEAF,

and others well known to fans

Prominent announcers will be asked

to serve on the board of officers of

the club. General meetings of all

announcers will be held in the United

States and Canada from time to time

to discuss the betterment of radio

programs, their amusement and edu-

A cordial invitation to become char-

ter members of the "Radio Announc-

ers of America" is extended to an-

nouncers of all stations throughout

the United States and Canada. De-

tails of the organization can be se-

cured by writing Dutee Wilcox Flint,

To-night, "Barber of Seville,"

Second Radio-Adapted Opera

Corriere D'America, Italian newspaper, will broadcast Rossini's opera

So enthusiastic was the response

to the first operatic radio presenta-

tion that this second popular opera

was planned to continue the operatic

series started by WGBS and "The

Corriere." It is an entirely new ven-

ture, for while a few operas have

been broadcast from opera houses,

in most cases these results have not

been as satisfactory as the specially

rranged radio version of "Cavalleria"

broadcast by WGBS with complete

'Barbiere di Siviglia" to-night.

Station WGBS in conjunction with

Station WDWF, Providence, R. I.

throughout the country.

cational features.

To Form Club

Radio Announcers

in the minds of radio listeners.

stage, screen and concert platform.



Rendezvous of the Masters of Music Verdi, Puccini, Wagner, Gounod, Leoncarvallo,

Beethoven-all these Masters of music will make your

living room their rendezvous through the enterprise

and generosity of the producers and artists of both Victor and Brunswick phonograph records, broad-casting through the local stations WEAF and WJZ. But only with SilverVoice, the loud speaker de luxe with the natural tone, may you hear the masterpieces of these masters of music with all the clarity, sweetness, and purity, that they would wish for and you will be delighted to hear.

SilverVoice is the supreme achievement of loud. speakers. It will increase the range and quality of your radio set a thousandfold.

Hear It At Any Of These Stores

Fordham Radio Shop, 140 E. Fordham Rd, Music Shop, 130 E. Fordham Rd. Prespect Radio & Electric Supply, 864 Longwood Are. J. Klausner, 669 Prospect Ave. Burnside Radio Shop, 2041 Davidson Ave. Willis Radio Co., 362 Willis Ave.

Wills Radio Co.,
563 Wills Ave.

BROOKLYN
Abraham & Strauss.
Fulton St.
Heller Electric Co.,
1041 Fulton St.,
Harry Parnes.
368 Livingston St.
Sterling Plano Co.,
81 Court St.
Hubert Radio,
1660 Myrtic Arc.
B klyn Wireless Co.,
1035 Flatbush Arc.
Greenpo'nt Dept. Sure.,
763 Manhattan Ave.
Brooklyn Radio Shop,
1064 Broadway.
Moskowitz & Son,
416 Central Ave.
Gould's Music Store.
343 Fresh Pond Bd.
A. Rersin,
1253 Redford Aye.
J. Twomey,
1284 Bedford Aye.
J. Twomey,
1284 Bedford Ave.
Capitol Talking Machine,
1139 Pitkin Arc.
Steven R. Wood Co.,
1497 Eastern Parkway.
Utica Radio Shop,
218 Utica Ave.
Crescent Hill Talk. Mach. Co.,
7125 3rd Ave.
Crescent Bhd.

The Universal Shop, 8504 117th St., Richmond Hill.
C. F. Fredericks, 9613 Janaica Ave., Woodhaven.
V. L. Ronnerman, 107 Woodhaven Blvd., Eimhurst, L. I.

Wholesale Distributors:

H. P. Baran & Co., 247 Park Ave. Musical Instrument Sales Co., 673-8th Ave. Royal-Eastern Supply Co., 114 W. 27th St. Silas E. Pearsall Co., 10 E. 39th St. Cheney Sales Corporation, 1107 Broadway

JERSEY CITY
Junction Phonograph,
787 Bergen Ave.
Jersey City T. M. Co.,
640 Newark Ave.
Mortis Schlein.
672 Newark Ave.
Radio Electric Co.,
195½ Newark Ave.

NEWARK
Chalmers Co...
879 Broad St.
Wilson Radio Shop,
209 Clinton Ave.
PASSAIC
Jos. L. David,
294½ Monroe St.

MORRISTOWN
R B Jolly.
76 Park Place.
J. D. Plank.
116 Franklin St.

HACKENSACK
Earl Radio Service,
27.3 Main St.

UNION HILL
Union Hill Melody Shop,
State Capitol Theatre,
Heraco Exchange,
615 Bergenline Ave.,
West Hoboken, N. J.
West N. Y. Heraco,
692 Bergenline Ave.,
West N. Y. N. J.

McManus Bros., Elizabeth, N. J.

CONNECTICUT

James Donnely,
South Norwalk.

145 East 42nd St.
United Electric Co.,
235 West 42nd St.
Radio Owners, Inc.,
331 Mailson Ave.
332 West 44th St.
Brownell & Kraft.
506 6th Ave.
Hart & Laue, Inc.,
750 6th Ave.

Solo 5th Ave.
Harit & Laue, Inc., 780 5th Are.
Rloomingdales, 59th St. and Lex. Ave.
Lexington Auto Ac. Co., 929 3rd Are.
Radio Retail, 175 West 72nd St.
K. H. Schullstrom, 30 R. 59th St. 72nd St.
K. H. Schullstrom, 30 R. 59th St.
Yorkville Auto Supply, 1214 Lexington Ave.
Melike Eberhart Radio Stores, 1263 Lexington Ave.
Sol Lazzaris, 216 East 59th St.
Korer Bros., 1247 3rd Ave.
Joseph Sigel, 1808 Srd Ave.
D. Vermeulen, 1870 3rd Ave.
Sol Lazzaris, 1808 Srd Ave.
D. Vermeulen, 1870 3rd Ave.
Solo Stra Ave.
D. Vermeulen, 1870 3rd Ave.
Kenn Bros., 2252 Third Ave.
Well Bros., 2252 Third Ave.
Well Bros., 2252 Third Ave.
Yell Bros., 2252 Third Ave.
Comperthwait & Sons, 121st St. and 3rd Ave.
Central Radio Co., 180 E. 116th St.
Comperthwait & Sons, 121st St. and 3rd Ave.
Central Radio Stores, 2049 Lexington Ave.
Riddle Primo Co., 24 West 125th St.
Kranich & Bach, 16 West 125th St.
Bach Radio Co., 601 West 145th St.
Ledo Radio, Inc.
403 6th Ave.
Ludwig Baumann & Co., 25th St. and Sth Ave.

chorus, orchestra and well-known singers. "Barbiere" will likewise be broadcast in similar manner. To Purchase St.,
Rye, N. Y.
Ossining Radio & Supply Co.,
Central Ave.,
Ossining, N. Y.
E. Billington,
Ossining, N. Y.
A. D. Becerott,
Ossining, N. Y. The famous role of Figaro in "Barbiere" will be sung by Lucillo Spada; Rosalinda Rudko, soprano, will sing Rosina; Giuseppe Barsotti, tenor, will be the Count of Almaviva; Giuseppe Lapuma, basso, Don Bartolo; Ivan Steschenko, comic basso, Don. Basilio, and Giuseppina Lapuma, mezzo-soprano, a minor role.

The opera will be given under the direction of Cesare Sodero.

Pa. University Day From WIP Back in 1826 the University of Pennsylvania inaugurated the custom of celebrating Washington's Birthday by their first University Day, which is an exercise for the remembrance of our first President and for the conferring of honorary degrees.

Now in 1925 the custom still prevails, and this year the exercise will be held on February 23, as the 22d falls on Sunday. The Academy of Music in Philadelphia will be used, and Station WIP has run private

lines to their main station. The principal speaker will be Dr. Ray Lyman Wilbur, president of Stanford University, and Drs. Wilbur and Hubert Work, Secretary of the Interior, will receive the honorary degree of Doctor of Laws.

The University of Pennsylvania Band, Orchestra and Glee Club will furnish the music. The ceremonies Mfd. by RADIOTIVE CORPORATION, 21st Ave. and 53rd St., Bklyn. begin at 10:30 a. m.

### WMCA, New York, Goes On the Air Broadway's Great White Way is to have an official broadcasting sta-

tion of its own, to provide a nightly The Home of RADIO 45 VESEY STREET, N. Y. Cortlandt 2612 WE LEAD AGAIN dedication will extend until midnight



**Leeds Super** Low Loss Radio Freq. Kit

consisting

radio frequency low loss condense Introductory price

**\$**\$295 WIRING DIAGRAM INCLUDED

\$1.00 5 Wire

Battery Cable

4 ft.... 39c

6 ft.... 59c

Atwater Kent

Mounted

\$50 A-R-1300 General Electric Crystal Set

\$142 3 Tube Set RADIOLA V \$32.45 SET ONLY

Collapsible \$1.15 \$13.00

Atwater Kent

Detector and

one stage amp.

COLLAP

SIBLE LOOP AERIAL 4-ft. spa THE FOLLOWING ATWATER KENT PARTS AT SPECIAL

RADIO

CORP

\$5.95 \$5.50 Atwater Kent Audio Frequency Transformers \$3.25

\$12.00 Atwater Kent Type 11 Tuner \$4.95

PRICES:

\$5.95 \$6.00 Atwater Kent Detector Unit for W. D. 11 \$9.45 \$1.00 Atwater Kent W. D. 11

\$12.00 Atwater Kent Super Low Loss Variable Condenser Air Tight .0005 Capacity

Socket ..... 49c OUR SPECIALTY— COMPLETE LINE OF

ATWATER KENT SETS Mail Orders Promptly Filled on Money Orders Only. Please Include Postage References—Coal and Iron Bank, N. Y. C.

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OU can easily drill clean, oratory tests it has highest unchipped holes in Radion insulating qualities. You save Panels with simple tools found that extra bit of energy which in any home. They are just as may be just what you need to easy to saw or cut; the edges tune in a distant station. are neat and smooth.

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KADION

The Supreme Insulation PANELS

Dials, Sockets, Binding Post Panels, etc.

### Broadcasting as It Is To-day

Decadence of Jazz and Desire for Better Music and Entertainment Noted by an Authority

City, on February 17, John A. Holman, respect to programs will interest you. manager of broadcasting for the Here they are: American Telephone and Telegraph Company, delivered an informal address on modern broadcasting, of Jazz ...... 75 p.c. 35 p.c. 5 p.c.

is a husky youngster about three Talks ...... 5 p.c. 35 p.c. 20 p.c. years old. It has brought to our In other words, in two years the firesides the personalities of Wood- demand for jazz music has shown row Wilson, Warren G. Harding, Cal- a tremendous decrease, while the de-McCormack and Mario Chamlee.

oughly fine work that has been done than they were two years ago. by "Roxy" and his "gang" from the Capitol Theater in connection with Popular Request Again Brings the installation of headsets for the Prisoners Before Microphone disabled soldiers, sailors and marines. The first time that Station WIP Through "Roxy's" efforts radio has ran wires from their main studio into abled soldier, sailor and marine in the large central room of the Eastern the hospitals in the East.

function of broadcasting throughout music, the response from the radio the United States. As against 36,500. public was tremendous. 000 who ride in automobiles, 38,500,-000 who listen to phonographs and the second time, and the response 20,000,000 who attend the moving pic- was even greater than the first. Folks ture theaters, there are 20,000,000 began to recognize the merits of inin the United States who listen in dividual performers and requested regularly on the radio; 3,750,000 have "Have C-1399 sing 'Pal of Mine.'" receiving sets, with an average of Or "Let's have 'The Rosary' by B 5.4 listeners to each set. This radio 1162." development covered a period of three Then followed two more broadcasts years as compared with twenty years that smashed all previous records for in the cases of the automobile, the applause, and the Eastern State Pen-

The function of broadcasters ular features of this station. throughout the United States is to So, by popular request, Station WIP provide this radio audience of 20,000,- will again bring its apparatus to the up to this time by the government, weeks in order that their performof which 646, or 53 per cent, have ance may be perfect. discontinued operating, generally for The program is varied. The prison economic reasons. Five hundred and band, string band, soloists, and even fifty-four are still active, of which dancing, are included. 100 realize their responsibility to the public from the standpoints of qual- "Pope Pius XI" by Crawford ity of program and transmission.

The Radio Audience

come each night without stopping to The talk is one of the series of "Rem knock at your door. We realize the iniscences of a Reporter" which Mr. full measure of responsibility which Crawford broadcasts weekly from your hospitality places on our shoul- WJZ, New York City. ders. We are striving to justify your faith by serving you clean, wholesome Radio to Help Celebrate programs - presentations of a high character, inspirational, educational as well as entertaining.

away from home have listened in broadcast features to-night and Monwith a friend and were transported day. General Oliver B. Bridgeman back for the moment to your own will introduce Marvin H Lewis, presifiresides. You heard WEAF's pro- dent general of the National Society gram. I'll tell you how that hap- of the Sons of the American Revolu-

The radio audience throughout the o'clock to-night. Mr. Lewis will speak country, realizing that most good on the subject, "The Man Who Made things come from New York, has Us." On Monday morning WJZ and asked that arrangements be made WRC will simultaneously transmit whereby they may be able to enjoy the Washington Birthday celebration the same advantages as you do by held in the Washington Auditorium, listening to the same program coming commencing at 9:30. At 2:30 to-morfrom their local station. By listen- row afternoon WJZ will pick up the ing to their local station atmospheric commemorative celebration given undisturbance is largely eliminated. | der the auspices of the American

ing experimentally to make use of certain of our long-distance telephone lines when they are not required for cities east of the Mississippi are betance lines to Station WEAF.

the hearts of 12,500,000 people.

Analysis of Letters compared with a monthly average of slowly.

Let a faith in not benefit . I

T A RADIO luncheon given by the Merchants' Association at tendency in this direction. the Hotel Astor, New York I believe that the tendencies with

1923. 1924. 1925. which the following is an abstract: Symphonic dance -Broadcasting, as we know it to-day. Good music.... 20 p.c. 30 p.c. 45 p.c.

vin Coolidge, David Lloyd George, mand for the better class dance or John J. Pershing, Robert Cecil and symphonic dance music has shown many others. It has brought us John a marked increase. Good music—that is, concert and standard numbers, It has made life worth living to philharmonic concerts and the likethe shut-in and it has diverted the are steadily growing in favor, and mind of the shel' shocked from his talks, inspirational, interesting and troubles. We all know of the thor- educational, are also more popular

State Penitentiary, and the "Boys Be-Let us discuss for a moment the hind the Walls" poured forth their

The microphones were installed for

itentiary became one of the most pop-

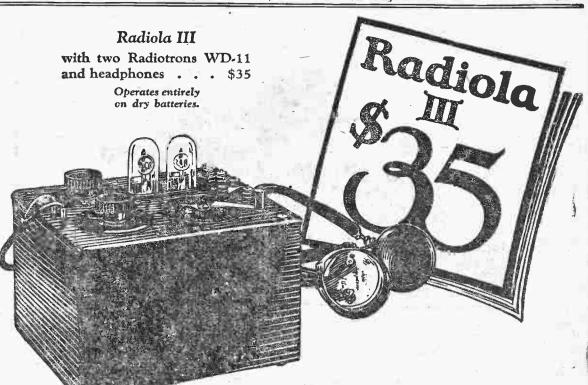
000 with broadcast programs. Twelve penitentiary on Thursday evening. hundred stations have been licensed The men have been practicing for

An intimate picture of Pope Pius XI will be presented to WJY listeners There are eighteen stations in the to-night by William H. Crawford. New York area. Each time you tune journalist and author, at 10 o'clock. in on WEAF you may be one of a Crawford will describe a meeting potential audience of 2,750,000 souls with the Pope in the days when he in this broadcasting area. Assuming was known as Father Achille Ratti, that only one in four of you are and held the post of curator of the at the time listening to WEAF, you Ambrosian Library at Milan. Crawwill join the WEAF family circle of ford was in Italy working on a maga-700,000 listeners. Of these 700,000 zine story, and had occasion to go to listeners 51 per cent own their own the famous library for references. He homes, 45 per cent own autos, 50 per | was referred to the curator, and spent cent own pianos and 73 per cent own two whole days in the company of the man who was later to become the Into your intimate home life we leading figure in the Catholic world.

Washington Anniversary

Station WJZ will commemorate the anniversary of the birthday of George Many of you, perhaps, on your trips Washington with three unusual tion, to the WJZ audience at 8:30 To serve this wish we are arrang- Legion at Town Hall, New York City.

Proper Way to Charge Battery the transmission of telephone calls. A storage battery can be charged Broadcasting stations in eighteen only by a direct current, and when charging the positive wire of the cities east of the Mississippi are being connected at their request by to the positive of the battery, and these specially engineered long-disvoltage of the charging current When this project is completed any should be somewhat greater than one of us talking into this micro- that of the battery, while the amphone will project his personality, in perage should not be above one-tenth one breath, to the firesides and into of the capacity. When a battery is charged or discharged very quickly it will overheat and the paste will Your letters to WEAF are analyzed fall out of the grids. Not only will very carefully and they are of great this prevent the battery from taking value to us in planning your future a charge, but it will short circuit programs. Fifty-four thousand let- the plates at the bottom. For this ters received in January, 1925, as reason the battery must be charged



A Great 2-tube Radiola.

Radiola III-a -with four Ra-diotrons WD-11, headphones and Radiola Loudspeaker. For distance on the loudspeaker! Big performance—and big value. \$83

Two Radiotrons—for distance on the headphones and loudspeaker volume from near stations. A two tube set built by the Radio Corporation of America—built for quality of performance—quality of tone—simplicity-and dependability. But priced at less than you could build it for at home! Buy one today for real radio fun. With this as a starter, you can add a Radiola amplifier later, if you want to.

"There's a Radiola for every purse"

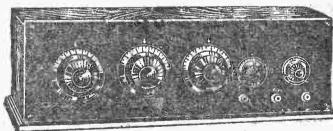
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SATISFIES EVERY RADIO WISH The Non-Radiating, Non-Squealing, Non-Howling Set with Purity of Tone-Easily Regulated from Softness to Enormous volume. Stations can be Regularly Located on Same Dial Readings. Anybody Can Operate It. Tunes Out Local Stations.

TIME PAYMENTS \$2 WEEKLY FREE INSTALLATION

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Telephone—CHickering 9880 Open Evenings AMBASSADOR CONVERT YOUR 3 TUBE AMBASSA-DOR INTO A TUBE RADIO FREQUENCY CIRCUIT.

\$10.00 COMPLETE All parts necessary, including Panel, Ambassador R. F. Coil, Cond., Socket, Rheostat, Dial, Binding Fost and Simplified Blue Print. "AT BARBLEY'S of Course"

\$10,000 RADIO STOCK TO BE SOLD AT PUBLIC BANKRUPTCY SALE

SALE STARTS AT 12 NOON, SAT. FEB. 21ST, AND WILL CONTINUE UNTIL ALL MERCHAN-FEB. 21ST, AND WILL CONTINUE UNTIL ALL MERCHANDISE IS SOLD.
ENTIRE STORE TO BE SOLD, INCLUDING FIXTURES AND COMPLETE LINE OF RADIO SETS, PARTS, SPEAKERS, R.C.A. TUBES, CHARGERS, BATTERIES AND ACCESSORIES. EVERYTHING MUST GO. FROM BUS BAR TO SUPER-HETERODYNES. 3 REID AVENUE

Bet. Broadway and De Kalb Ave