RADIO PROGRAMS FROM ALL SECTIONS

HOW TO CALIBRATE YOUR SET—(See Inside)

15c. a Copy

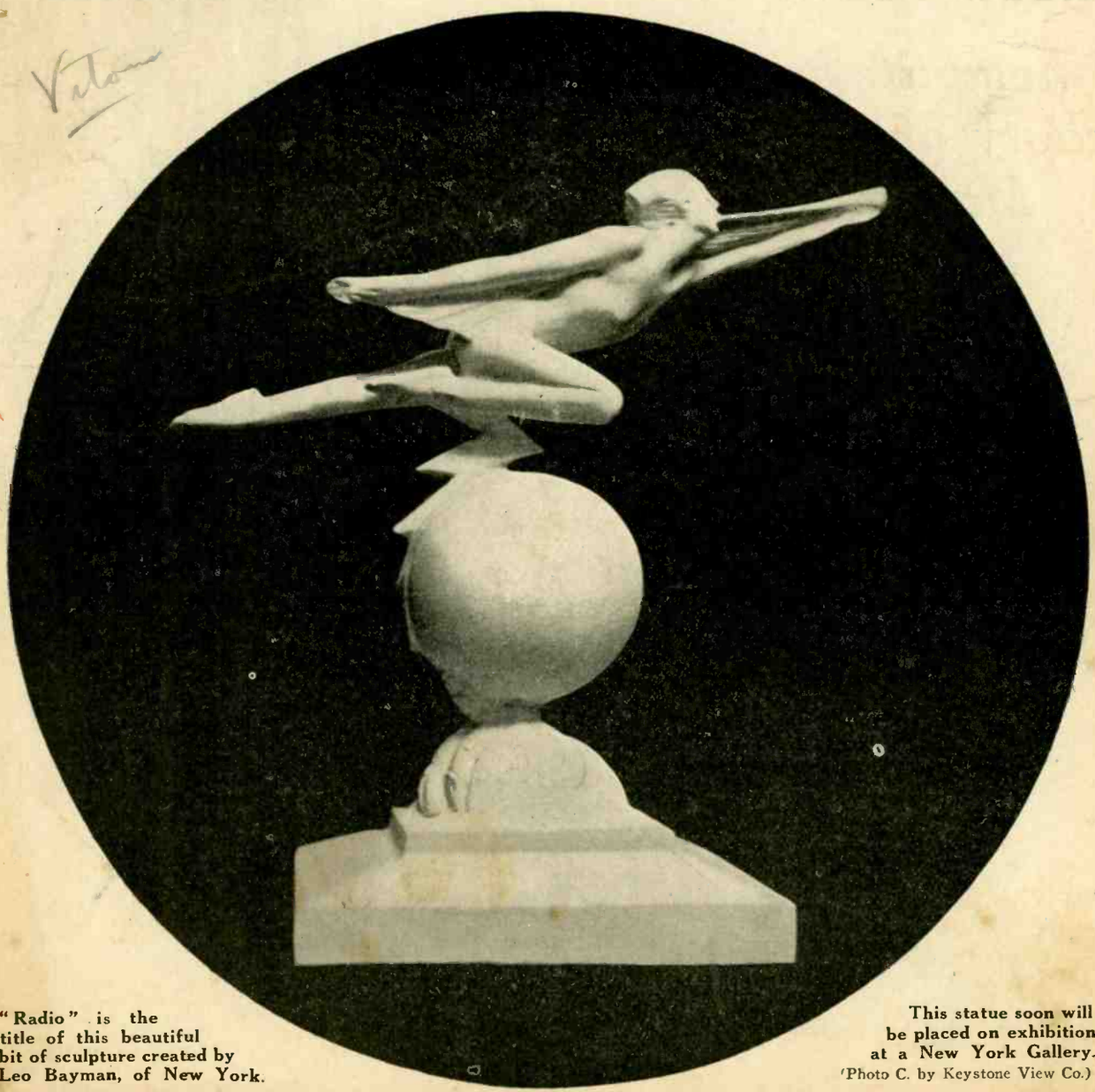
February 2

1924

RADIO WORLD

Title Reg. U. S. Pat. Off.

ILLUSTRATED EVERY WEEK



"Radio" is the title of this beautiful bit of sculpture created by Leo Bayman, of New York.

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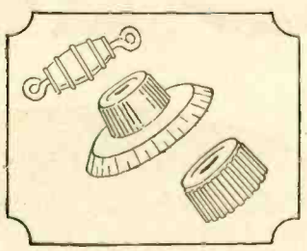
12x21	14x18	20x24



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VOLUME FOUR OF

RADIO WORLD

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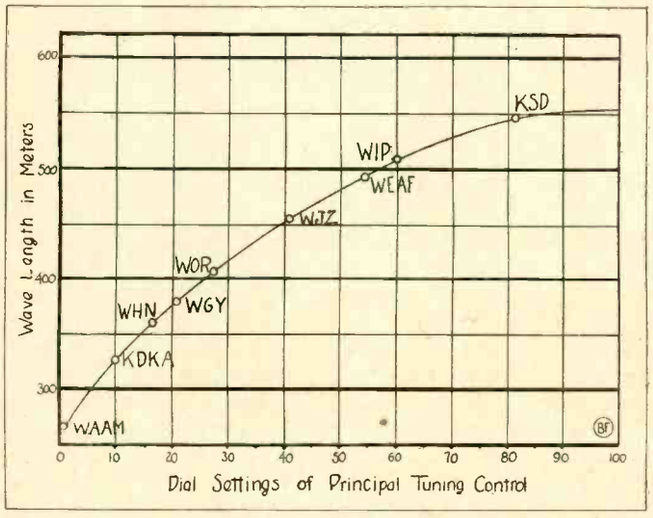
How to Calibrate Your Set for All Broadcast Waves

By Brainard Foote

HOW many times have you said, "Golly, here's a new station opening up on 285 meters tonight! Wish I knew where to find that on my set." Or perhaps it was this way: "Piano solo all right, but the paper says there are three pianos going right now somewhere around 325 meters. Wish I knew that station's wave length and I'd know just who it is!"

Ever occur to you that it *is* possible to know just what wave length your set is tuned to for each adjustment of the dial? And did you know that you needn't borrow an expensive wave meter to perform this calibration because the very broadcast stations you have been hearing day in and day out offer the simplest and surest method for determining the wave length at *every* degree on the dial?

Of course, in order to take best advantage of the scheme to be suggested, it is necessary that the set be one which has at least one tuning control which is always set the same for the same station no matter where the other dials may be. A single circuit set is one where this holds true, provided nothing happens to the antenna. The very best type of receiver for the purpose is a set using the "untuned" antenna system, for with such an outfit, there is but one tuning control and one regeneration control. The neutrodyne, also, may be accurately calibrated by the method shown, as well as any other form of radio-frequency set, using loop or outside antenna.



Illustrating how a chart of the dial settings of a receiver can be arranged to simplify the tuning of new stations.

Where the receiver is loose-coupled, the best position for the coupler should be found and left alone, so that any adjustments of the coupling will not throw off the setting of the secondary dial. The dial which tunes the grid circuit is the best to select for the calibration.

First of all, procure a sheet of graph paper something like the style illustrated herewith. It may not be exactly like it, but that matters not, just so long as it is divided into "tens" in some way. A heavy line at every tenth helps the eye quickly to locate the various points. Besides this a "French curve" is wanted, and this may be obtained very cheaply at any architectural or artists' supply house. A pencil may be used to draw the lines on the sheet, or, if one is a bit more fussy about the appearance, the regular ruling pen and Indian ink should be employed.

Now comes a part which will take a little thought. Since the entire sheet of commercial graph paper is covered with "squares" the horizontal and vertical axis upon which the dial settings and wave lengths are marked had best begin one or two large squares from the bottom and one or two in from the left margin. Lines are drawn to correspond with the lower and left-hand lines of the accompanying figure.

In selecting the scale, remember that it should be as much spread out as can be in order to permit of greater accuracy. Since the dial has 100 divisions (as a rule) there are to be ten large squares on the sheet, with each heavy line running vertically marked 10, 20, 30, etc., as indicated. These represent the dial settings, and the setting 23 is quickly found by first looking for 20 and then counting over to the right 3 small divisions.

Next come the wave length locations, and inasmuch as the usual scale is between 250 and 550 or 600, the vertical axis is divided accordingly. It will usually crowd the scale too much to select each small unit as 10 meters, and it is probably best to double this and to choose two small units for 10 meters—the two units corresponding to the one unit shown in the drawing.

The next part of the calibration consists in listening in on the set and making a list of the secondary dial readings for local and perhaps one or two DX stations pretty well scattered over the range. Those made for the accompanying graph were as follows:

WAAM	0	263 m.	WGY	20½	380 m.	WEAF	54 492 m.
KDKA	10	321 m.	WOR	27	405 m.	WIP	60 509 m.
WHN	16	360 m.	WJZ	41	455 m.	KSD	81 546 m.

And alongside each dial reading for the above stations, write down the wave length of the station—something any one can find out from a glance at RADIO WORLD's Broadcast List. Now we're getting down to business. Make a dot

(*Concluded on next page*)

No SOS from NERK—"Shenandoah" Radios "Under Control"

By Carl H. Butman

ALTHOUGH the 300-watt radio transmitter on the "Shenandoah" was disconnected and wet when she tore loose from her mooring mast at Lakehurst, N. J., last week, Gunner J. T. Robinson, in charge of radio, had his set connected, dried and working within an hour and sent out a reassuring message to the Naval Air Station.

While the "Shenandoah" was undergoing her mooring tests, her 300-foot aerial was also being tested for capacity, inductance and resistance, according to Gunner Robinson, who was aboard on the wild night trip. The radio apparatus was disconnected and replaced by testing instruments to ascertain the efficiency of the present aerial, in anticipation of installing the newly designed 1,000-mile set now building at the Naval Radio Laboratory at Bellevue, Md.

When the former ZR-1's nose cap gave way, officers and men jumped to controls, engines and ballast releases, but Gunner Robinson, in his radio shack in the control car, sprang to his set. Tearing loose voltmeters, ammeters and other testing instruments, he began hooking up his transmitting and receiving sets, so as to establish communication with the home station. But he found his apparatus was wet from the driving rain and had to dry it all out before he could use his 'phones or key. In less than an hour he had his set working, but it was not an SOS that he sent, as most sea craft would have been forced to do under the circumstances. Instead, he ticked off a mesage that the "Shenandoah" was under control, which put at rest any fears the navy may have had and allayed alarm among the families of the officers and men.

Out of the silent darkness came a call for NERK, the "Shenandoah's" radio call. It was WOR, at Newark, giving him his first position report, verified later by Lakehurst. The navigators then knew where the gale was driving their ship.

"Communication was then good for the remainder of the trip," says Gunner Robinson. "We kept the base well informed and they gave us weather data," he adds summing up his brief description of an unprecedented experience fraught with great danger.

It is evident that radio had considerable to do with the remarkable navigation of the aerial cruiser, in advising of her safety, and in bringing in reports from her base. The reports from NERK came through especially well, as the air had been cleared for this mobile station, which proved indeed mobile.

The old set, now almost historic, will soon be replaced with long distance and medium range transmitters, ultra modern receiving sets, and a radio compass for use in the Arctic explorations. The designers are far from disappointed, however, as the old set functioned well after being hooked up while en route on the night cruise of the "Shenandoah."

(*Concluded from preceding page*)

or small circle in pencil at the point where the dial setting line and the wave length line for each station intersect. For instance, we have WHN at 16 on the tuning dial and 360 meters. Running up the "16" line and across the "360" line until the two cross, we make our dot or circle. The same thing is done for all the stations and the dots will be found to form a smooth curve, usually bending over at the right somewhat in the style shown in the figure. Different types of variable condensers will give various types of curves.

Draw the curve next. Place the French curve along the dots, endeavoring to make the line pass through as many of them as possible. If there are one or two dots a little off, never mind, but *average* the location of the curve so that a dot a bit off on one side will be offset by another one off on the other side of the line. A sharply tuned receiver will enable the settings to be found with great accuracy, especially on the shorter wave lengths, and the curve may then be run with ease. Remember—the curve *must* be smooth.

Several applications of the French curve may be necessary before the complete line is drawn, for the curve may not be large enough to take the whole business in at once. When it is laid out carefully in pencil, it may be inked in. It is not necessary to show the positions for the local stations as has been done in the figure, but these may be put in if one so desires.

Our curve is now finished and ready for use. It should be pasted on a piece of cardboard and hung near the set. Suppose there's a new station, KZYX, coming on the air tonight, and the wave length reported in the paper is 348 meters. At 8:30, the scheduled starting time, let's tune the set to that wave length and see if we can't tack KZYX on to our DX list, which already looks quite imposing. Where shall we tune for KZYX? Well, we'll find 348 meters on the vertical margin, and follow this line across till we strike the curve. Whatever vertical line happens to "hit" the curve at this point we follow downwards and find out what dial degree corresponds with it. 348 meters we then discover to be just a little short of 15 degrees on the tuning dial. How much better this is than aimlessly "fishing" around. Perhaps the station isn't exactly on 348 meters despite its published wave length, so we'll hunt between perhaps 13 and 18 for KZYX.

Then there's another angle to the situation. Suppose we have picked up a station exactly on 26 and hear the first two letters of the call, but miss the rest. Suppose the announcer manages to say "CK—" before something else butts in and drowns him out. Ordinarily we'd have but slight idea how to even guess as to the station's call letters, but now we have a real clue. Consulting RADIO WORLD's Broadcast List we look among the CK— stations for the wave length corresponding to a dial setting of 26, which is 400 meters. Luck is with us, for we find only one CK station on 400, and that is CKCR, St. John, N. B., Canada. Looks as though we might add another call to the list, doesn't it?

Dial settings really mean something, but in order to find out what they mean and to derive some real benefit from them, the curve is a wonderful silent partner. As time goes on and we desire perhaps to improve the accuracy of the graph, it is merely a question of adding some more calls to the list, getting their dial settings, and placing more "dots" on another graph sheet. The more points there are on the sheet, the more accurate will be our curve, although it is best to bear in mind that the reliable stations which have been transmitting for a year or more are quite accurately adjusted to their correct wave lengths and therefore furnish the best standards for the calibration.

An Extremely Low Cost Receiver

By C. Whitz, Consulting Engineer

QUITE recently a friend asked me just how simple and inexpensive a radio receiver could be made and still be reliable. He informed me that he wanted to try out a radio receiver that would bring in the distant stations and still not cost very much. While it is true that there are a lot of regenerative radio sets that claim simplicity, many have found that these sets are either critical on one or two controls or are not what can be generally classed as reliable. In my opinion a reliable set is any set that can be put together by a novice who has enough knowledge to follow the diagrams and will work satisfactorily

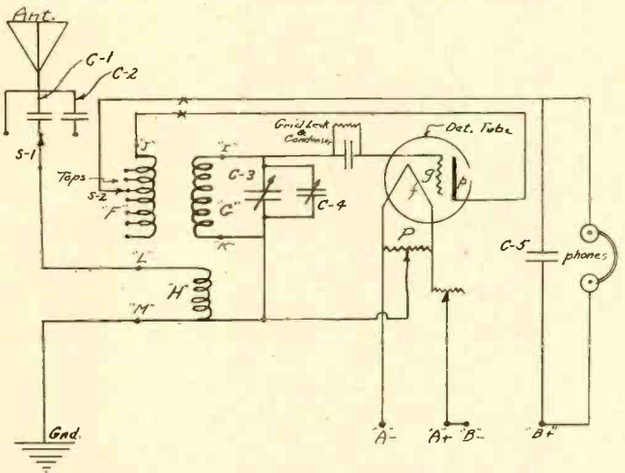


Fig. 1. A receiver which, due to the peculiar construction of its inductance, is selective and as the tickler feed-back is tapped can be controlled easily without causing it to "spill over." Fixed coupling is used throughout for simplicity of control.

right "off the bat," or can be made to work so by a simple operation.

On investigating the cost of a receiver one will find that variometers, variocouplers, and condensers form the major expense of the parts. If a set can be designed to use no expensive parts, then such a set would be very near the ideal to build at home. I do not in the least mean to say that such an outfit would represent the best type of receiver to be had, for such is not the case; but it would represent a good receiver for the average fan who wants something constructed easily at home.

There are only three main controls on the set described herewith. Tuning is accomplished by means of a variable condenser shunted with a small vernier condenser for fine adjustment, and volume and quality are controlled by the switch arm S-2 together with the potentiometer P. So smoothly can this receiver be tuned and adjusted that with little experience, long distance results can be readily obtained.

The general connections of the apparatus are shown in the diagram Fig. 1. In reality the circuit is nothing more than a special type of coupled circuit regenerative receiver. Instead of using variocouplers, an especially designed tuning coil is employed. This coil can be readily wound at home with little or no apparatus or tools. The wire used on all three of the coils comprising the unit is No. 22 DCC magnet wire, and no shellac or other binder is used to hold these windings tight. The use of shellac for this purpose is very bad because the novice often exceeds the safe limit in its use and literally plasters the coils with a thick coating, thereby cutting down the efficiency of the winding and really making a good condenser out of a coil that should be a good inductance. The wires should be wound tight on the tubing and the end connections should be securely locked by drilling two small holes in the tubing and wrapping the end wire through these holes several times until it is solidly anchored.

The coils "G" and "H" are both wound on the same size radion tubing with the two windings spaced as illustrated in Fig. 2. The coil "G" has 60 turns of wire untapped, and the coil "H" has only 10 turns, untapped. The coil "F" is wound on a 3" section of a size larger (in diameter) tubing and has 42 turns in all with taps for switch points at every sixth turn. Although the exact diameters of the two tubes are not critical values, it is advised that the inner tube be 3½" in diameter and the outer 4" in diameter. Any two sizes of tubing having approximately these diameters and which will slide into each other will suffice.

While the illustration, Fig. 2, shows the 4" tube located in the middle over the coil "G" in order to allow space for easily illustrating the coil "G," in the actual construction it will be of advantage to place this outer tubing with its end flush with the near end of the coil "G" tube, which is the inner tube. By so placing this tube, the marginal space on each tube can be employed to securely fasten the two tubes together by means of two or three brass machine screws and nuts, evenly spaced around the circumference.

The leads and taps from the middle coils in the detailed diagram showing the tuning unit assembly are so marked that they may readily be identified in Fig. 1. When mounting this tuning unit on a panel see to it that the switch points for the taps from coil "F" are directly in front of these taps. This makes the shortest possible connection from the points to the taps and

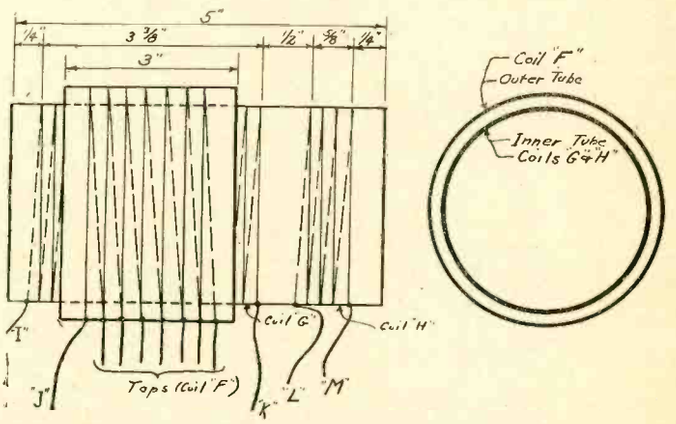


Fig. 2. Diagrammatic illustration of the construction of the three coils which form the antenna, secondary and feed-back inductances of the receiver described herewith.

greatly increases the efficiency of the tuner. The movable plates of the condensers C-3 and C-4 must be connected to the ground side of circuit. The wiring must be laid out as compactly as possible, which will not only mean less space occupied by the receiver but a better receiver. No shielding is recommended. Since the shafts of the main tubing controls C-3 and C-4 are attached to ground an extremely small amount of body capacity effect is noticeable. If, however, you should desire to shield this set just place a small circular ring

(*Concluded on next page*)

Radio in the Canal Zone "Battle"

WASHINGTON, D. C.—There is a "battle" raging off the Atlantic entrance to the Panama Canal. If you listen in you may pick up code press reports from the great Naval radio station at Balboa, giving details of the simulated conflict between the Black enemy fleet and the Blue defensive force now engaged. If you cannot tune in, you can at least read of the efforts of the Black fleet in the Atlantic to keep the Blue Pacific fleet from coming through the canal to join the Blue Atlantic force and defend the Gatun locks, as reported by seventeen correspondents at "the front."

Military and naval experts believe the joint maneuvers, which continued during the past week, will have material effect in determining the future land defenses of the Canal Zone. The war game is being worked out, not alone for practice, but to learn how well our present fleets and land defenses can protect the zone in time of actual war. It is believed that radio will play a material part in any form of future warfare in the region, and certainly it will prove an important aid in the present maneuvers, particularly in bringing the Blue forces together, in spotting gun fire when contact with the enemy fleet is secured, and in communications between sea and land forces, as well as with their air auxiliaries.

Uncle Sam is properly proud of his radio equipment in the Canal Zone, particularly of the gigantic 100 KW, CW arc transmitter located about midway in the zone, on the hills near Darien, but operated by remote control from Balboa, the control plant. NBA, as the Balboa station is recorded in radio call books, is no newcomer, but is a real old timer, having been established next after NAA, at Arlington, the navy's first high-powered station. From the aerial, mounted on three 600′ towers, spaced 900′ apart, to eliminate absorption losses, this station at Darien transmits over 2,800 miles to radio central in the Navy Building at Washington directly. It is over this circuit that official dispatches and as many press reports as can be handled were received from the "battle front," for distribution to the several papers and press associations by wire.

Essentially, however, this station is not established to handle commercial or press traffic. It bridges the distance to the Capitol for another purpose in peace and war. It provides a vital circuit for official communication between governmental officials and military and naval officers. Auxiliary radio sets make possible instantaneous communication between the Atlantic and Pacific canal terminals, and ships and aircraft of the navy on opposite coasts, as well as with Gulf ports, Porto Rico and the West Indies. A dead spot makes communication with California stations difficult. In time of war, naval officers say the blockading or capture of the Panama waterway would be one of the primary objects of the enemy, and in such an event, radio would comprise the one available agency for effectually co-ordinating the activities of all the canal defenses.

The listed range is 3,000 miles, but the messages sent from the big set reach Constantinople, Southern Australia, and Montevideo. Besides the high-power arc set at Darien, there is also a 5-KW spark set. A 10-KW tube set will soon be installed, and eventually other improvements will be made. At Colon, NAX, two other sets are in operation; one a 5-KW spark set and the other a 3-KW tube set. These, together with a new TD set of 750 watts, communicate shorter distances and with ships at sea up to about 500 miles. All reception is handled at Balboa, some distance from the transmitting stations, permitting duplex operation, Balboa serving as radio central. Two other Army sets are in operation at Colon and Darien, used chiefly for communicating with military and naval aircraft, but one of these may be used for broadcasting, it is understood. The radio defenses of the canal, it is pointed out by experts, are exceptional and so far have proven efficient. The present maneuvers, however, may show that improvements are necessary.

(*Concluded from preceding page*)

of copper foil immediately in front of these two condensers and attach it by a wire to the ground terminal of the receiver.

The constants for the other parts used in this set are as follows: The condenser C-1 and C-2 are fixed mica condensers having the respective capacities of .00025 mfd. and .0005 mfd., while the mica condenser C-5 has a capacity of .0025 mfd. The two variable condensers C-3 and C-4 are the main tuning controls of the circuit and should be a high grade standard make of condenser. The condenser C-3 is an 11 plate condenser, and C-4 is a small two-plate variable used for fine adjustment. Primarily, this receiver is designed to operate with the new dry cell UV199 or C299 tube, and therefore a 30 ohm filament rheostat is needed. The grid leak and condenser must be purchased to fit the recommendations of the tube manufacturer for the particular type of detector tube used.

The operation of this receiver is simplicity itself. After lighting your tube see to it that your "B" or plate battery is connected in with the positive side towards the plate as indicated on the diagram (Fig. 1). Connecting the antenna and ground leads to their respective terminals on the receiver, place the switch arm S-1 on either one of the three taps and slowly adjust or change the taps on "F" by means of S-2, starting at the tap which cuts in the smallest number of turns. If your potentiometer, P, which has a resistance of 200 ohms or more, is placed at one of the extreme positions you will notice a rather sharp click as you pass from one particular tap to the next. This click is an indication that the detector tube has jumped into oscillation or "spilled over." Although this set does not radiate as much energy as the average single circuit receiver owing to the fact that it is a double circuit tuner, it is not kind to your next-door friend to allow your tube to "spill over," since this will cause whistles and generally upset the ether in your neighborhood. If your set does not "spill over" as described, then reverse the plate tickler leads at the points marked x x in Fig. 1.

Tuning is accomplished by turning C-3 and C-4 after the tap next to the "spill over" tap has been ascertained. To increase the signal volume try retuning and changing the tap on the switcharm S-1, then using the next higher tap on "F," being sure to place P at the mid position first. Now slowly move P toward first one end position and then the other and note which direction gives the better tone and volume. This operation should be continued until maximum quality and volume are obtained. It will be necessary to slightly readjust C-3 or C-4 to put the final finishing touches on the tuning. After very little actual tuning experience you will discover that certain taps on S-1 and S-2 will give best results for certain wave lengths.

Amateur in Porto Rico Communicates with States in Two Minutes

SAN JUAN, Porto Rico.—Anxious to obtain daily reports regarding the condition of his daughter who was ill in New York City, where she had been sent to attend school, Luis Rexach, a contractor and builder of this city, succeeded in establishing desired contact with the United States by means of his amateur radio station. A letter would require fifteen days and the condition of the cable service at the time was such that it required three days to get a reply.

"Last spring I found it necessary to send my five-year-old daughter to a school in the United States, so that she should properly learn the English language," said Mr. Rexach.

(C. International Newsreel)
William Baudondistel, 547 Tenth street, Brooklyn, N. Y., who was the winner of the four-tube receiver given as a first prize in the Christmas Seal Contest. He gave the greatest number of correct answers to the questions governing the contest, thus winning the receiver.

"Recently we were advised that the child had suddenly become sick and her condition was serious; the fact that she was born in the tropics and unaccustomed to a cold climate making it worse for her. We decided to try amateur radio.

"At various times I had communicated fairly regularly with amateurs in the southern part of the States, but seldom with New York as the interference at that end was terrific. However, H. H. Carman, an amateur at Freeport, L. I., said he could copy my signals at any time. He willingly offered his services and we at once made a nightly schedule.

"Exactly 10:30 P. M. every night I would call 2EL and he would always come back with the courteous

(C. International Newsreel)
"Jolly Bill" Steineke, the radio cartoonist of WOR, Newark, N. J., and "Chief," his ethereal canine pal. Fans know and appreciate "Bill" but few have had the opportunity to see "Chief," who occasionally puts in a good word or two over the air.

'QTC? QSA QRV GA.' He would then telephone direct to the child's residence and inquire how she was getting along. He transmitted the information to me immediately. Frequently it required less than two minutes to obtain a reply as I used to stand by until he called again. If amateur radio should do nothing else for me in my whole lifetime, I will always feel that my debt to my fellow amateurs and to the American Radio Relay League, can never be fully paid."

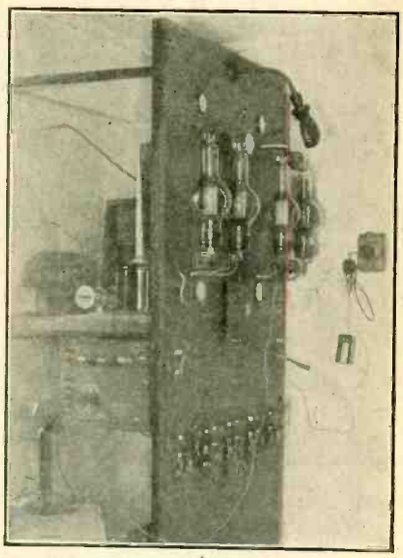
German Broadcasting

BY means of propaganda, German radio manufacturers are endeavoring to encourage the public to protest against government restrictions on broadcasting. Official restrictions have impeded the popularizing of radio telephony in Germany, it is reported by Attache Herring at Berlin, although, he says, the commercial development of radio communication in Germany is approaching a competitive character. At the Leipzig Fall Fair, a program was broadcast from Berlin on a 2,500 meter wave length and was successfully picked up in Leipzig, a distance of 93 miles.

(C. International Newsreel)
Dr. James Harris Rogers, famous for his underground and undersea radio reception and transmission experiments, in his laboratory at Hyattsville, Md., listening to broadcast signals from a conch shell loud speaker. In all his experiments Dr. Rogers uses a loop suspended in a copper encased well under his laboratory.

Italian Radio Regulations

FROM Rome comes word that the Minister of Posts and Telegraph will delegate the right to license relative receiving stations to transmission concessionaries. Private receiving stations will pay an annual tax of 50 lire, but a surtax is imposed on stations receiving stock exchange and market news. It is also possible to raise the tax on foreign-built receiving apparatus to 300 lire per annum. By a decree issued last June, those who intercept and divulge official messages



(C. Foto Topics)
Transmitter panel of Station 2 GR, owned and operated by John M. High, Jr., Riverdale, N. Y. The entire transmitter is remotely controlled, and its operator can talk from several places around the house, switching being done by means of magnetic relays.

are liable to imprisonment up to five years.

Radio in Chile

A "CONCESSION" to erect and operate a wireless station, and corresponding receiving stations, for a period of thirty years to Messrs. Errazuris Simpson and Jose De La Taille, and Siemens Schuckert, Ltd., has been announced by the Chilean Government. A novel feature of the contract, so far as Chile is concerned, is the provision that "any difficulty or claim arising from the concession shall be definitely settled by the Chilean authorities or courts, without the intervention of foreign diplomats or officials."

A Handsome Home-Made Radio Cabinet

By E. E. Gibboney

IN the picture herewith readers of RADIO WORLD will recognize the panel layout at the right as that belonging to the Federal Type 61 receiver. The panel at the left is a hook-up of my own. It consists of a home-made wave trap built at the top of the panel, and a voltmeter underneath for quick reading of "A" and "B" battery voltages.

The cabinet in which the receiver and other panel is arranged is an idea of my own. And, I might add also, built entirely by myself, including the staining and finishing of the woodwork. At the left of the cabinet I have my "A" storage battery and charger in the bottom compartment and have a shelf built in the same side, about 10″ from the top which gives ample room for my "B" batteries. I have the storage "A" battery and charger hooked up with two switches, one a double-pole single-throw snap switch which cuts in and out the 110 volt house current of the charger, the other a double-pole double-throw switch with my battery leads hooked on in the middle, my charger leads at the bottom and my leads to the receiver taken off of the two top terminals. In this way, when the switch is up my "A" battery is connected to the receiver. Then by simply throwing it down and snapping the other switch my battery is on charge. It is so simple that the battery can be placed on and off charge without moving out of your chair in front of the receiver.

Extremely neat and attractive cabinet built by Mr. Gibboney for his receiver. An arrangement of this sort enhances the sport for the man who likes to consider his receiver as a useful piece of furniture.

Another important item also is the fact that by using the double-pole double-throw switch, it becomes impossible to place the battery on charge while the battery is connected to the receiver. And, by the way, a good many months ago I learned that this very thing did not pay. In fact, I learned it to the tune of buying five new vacuum tubes, when I accidentally flipped my charger on while the battery was hooked to the receiver.

But to get back to the cabinet. On the other side of the receiver (right) I have my loud speaker housed. It is not a built-in loud speaker but one of familiar make. In building the cabinet I made the compartment large enough to take the loud speaker very readily and left space enough to place my magazines, books, spare tubes and tools all hidden from view. Directly in front of the receiver you will note a glass top on the arm. In reality I built this up as sort of a desk pad with a glass top and beneath the glass top I have a record of each station I have received with the set. This record to date covers 95 stations, from 34 states, three Provinces in Canada, and PWX and 6KW, Cuba.

The cost of constructing this cabinet is surprisingly low, the whole affair not costing me over $50.00, which includes everything. If any RADIO WORLD readers would like to construct a similar case and will furnish me with the name and exact size of his panel or panels I will be very glad to send him a piece bill of the material he will require. He can then have it cut out at any woodworking establishment.

To Broadcast Records in the Making

WABU, the new Victor Talking Machine broadcasting station at Camden, N. J., will soon give the public an opportunity to hear phonograph records in the making. That is, radio fans will be permitted to hear original records before they are released. When famous vocalists or musicians are about to perform for the reproduction on master phonograph records in the studio, a microphone will be placed alongside the recording apparatus and as the artist renders his piece for record the radio fans will hear it over the air.

The Columbia Graphophone Co., through co-operation of the A. T. & T. Co., and Station WEAF, will also start broadcasting new records soon.

This system is likened to "first nights" at operas and theatrical productions, seats at which are always sold at a premium or distributed to the elite and members of the press. By means of radio broadcasting, fans will now be permitted to hear new records before they are put on the market. It is a unique feature, welcomed by all receiver owners who await the advent with pleasant anticipations.

Radio Facts

IN an address recently delivered before the East Side Y. M. C. A. Radio School, New York City, Pierre Boucheron, advertising manager of the Radio Corporation of America, demonstrated the opportunities in the radio field today by quoting many interesting facts, of which the following is a summary:

563 licensed broadcasting stations in the United States.
3,000,000 radio receiving sets in this country.
10,000,000 listeners.
250,000 persons directly or indirectely connected with the industry.
3,000 manufacturers of radio supplies.
1,000 wholesale distributors and jobbers.
25,000 retail dealers of all kinds.
1,000 newspapers which carry radio programs and radio news columns.
3,000 country weeklies with radio sections.
30 radio periodicals.
50 magazines carrying radio sections.
250 popular and technical books written on radio.
7 radio trade papers.
$175,000,000 estimated expenditures by American public during 1923 for radio material of all description and make.

Good "DX Getter" of the Reinartz Type

By Leroy Western

WHILE the standard single-circuit tuner using a variocoupler for both tuning and regeneration has proven quite satisfactory both for local and long distance reception, there are many drawbacks to its extensive use, among them being lack of selectivity and the ease with which the set oscillates. This latter characteristic of the set renders it impractical for use in congested districts as radiation takes place quite readily, thereby causing interference with nearby receiving sets.

The circuit diagram herewith has many advantages as compared with the above mentioned tuner. In the first place, it will be noted that it is inductively coupled and not conductively coupled as is the case in a single circuit tuner. In the first place, this means that radiation will be much weaker. Of course, some will speak up at once and say that signal strength will be cut down because of the losses in transformation. True, signal strength will be cut down somewhat, but not to any appreciable extent. What little strength of signal is lost will be made up for by the increased selectivity and the freedom from interference. This circuit might also be likened to the original Reinartz in that regeneration is performed through a capacity feedback. This has many advantages, most of which will be obvious once the set is put into operation.

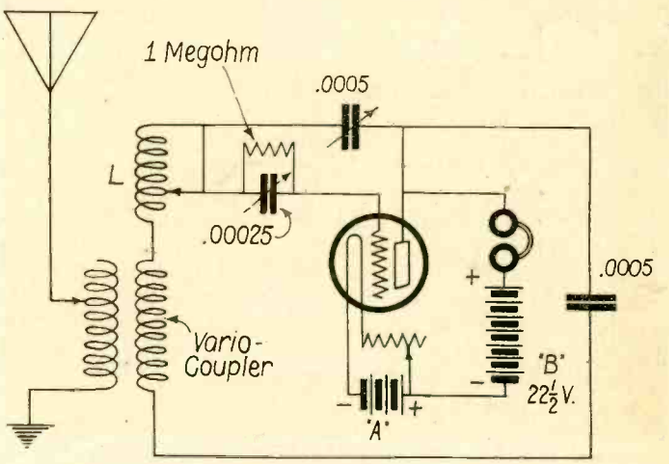
In the actual construction of this set, a standard variocoupler was used in connection with a small extra coil, L, shown in the diagram herewith. This coil was wound as follows: The core consisted of a radion tube, 3" in diameter and there was wound thereon 45 turns of No. 20 DCC wire. Taps were taken off every five turns for the entire length and they were connected to switch points. The switch arm was then connected to the grid leak and condenser and also to one end of the coil. The other end of the coil was connected to the rotor of the variocoupler. The switch arm was also connected to a .0005 mfd. variable condenser which in turn was connected to the plate as shown. The other connections are all clearly indicated in the diagram. In the writer's opinion, although he has never tried it out in actual practice, a loose coupler with a tapped secondary could very well take the place of the variocoupler and the external tapped coil. In this case, connections would be taken from each end of the secondary, and the switch arm would be connected in the peculiar manner mentioned above and illustrated herewith. This would render the entire tuner with the exception of the variable condenser self-contained and no extra coil would be necessary.

The tuning of this set is very simple and once the knack is obtained stations may be brought in at will by returning to the same settings on which they were last received. Of course it is possible to receive any one station on different combinations of settings on the tuner and all these positions must be tried until the best one is found. After learning to tune this set, a chart can very readily be made showing the various settings for certain stations. This will assist in locating them whenever desired.

The tuning is as follows. The switch arm is set on the second tap and the rotor turned throughout its range. If nothing is heard, set the arm on the third point and go through the range of the secondary again. This is continued, moving the switch arm one point at a time until the signal is heard. During this procedure the switch arm on coil L should be set at about the center tap. When the signal is brought up to its maximum strength by means of the variocoupler switch arm and the rotor, the switch on coil L is turned to the right or to the left until the signal is heard at its greatest volume. At the same time, the variable condenser connected between the grid and plate should be varied and it will be found that regeneration will be accomplished, building up the signal strength to a considerable extent.

The tube used in this circuit should be of the detector type. The writer found that a VT1 with 67½ volts on the plate gave excellent results and a surprising number of stations were logged. Of course, the dry cell tubes or in fact, any detector tube may be used with very good results. The "B" battery voltage should be varied until the best working point for that particular type of tube is found.

Upon experimenting, it is sometimes found possible to eliminate the .0005 mfd. fixed condenser shown in the diagram. This very often assists in reception and



Capacity coupled receiver which is selective and easy to operate if properly constructed.

the circuit should be tried both with and without it, the results being noted and the circuit should then be used in the manner found best.

The value of the grid condenser was found to govern the action of the set considerably. Therefore, a .0005 mfd. variable condenser was used so that it could be varied at will. If the builder does not happen to have such a condenser on hand, a .00025 mfd. fixed condenser may be used as shown in the diagram. This, however, will result in decreased efficiency and for very best results, particularly in "DX" work, the grid condenser should be variable.

Radiation Interference Committees Meet

A JOINT meeting of the Engineering Committee and the Publicity Committee, appointed by the Radiation Interference Conference on January 16, was held at The Engineers' Club, New York City, on January 24. Methods of attacking the problem in hand were discussed at considerable length and a plan of campaign was adopted. Letters commending the appointment of the two committees were read and other correspondence emphasized the importance of the work that has been undertaken. Enthusiasm marked the meeting.

Erratic Distribution of Radio Sets on Farms—Educational Campaign in Order

By S. R. Winters

THE county agricultural agent in Nicholas County, West Virginia, who figuratively raked the entire rural area with a fine tooth comb and found only one radio-telephone receiving set, built and operated by a boy, and the agricultural agent in Saratoga County, New York, who enumerated 2,500 wireless receiving outfits on farms, suggests that the use of this medium of communication in the countryside is like a freakish tornado—it hits in spots. A survey recently completed by the United States Department of Agriculture through its agents afield indicates that there are 39,869 radio-telephone receiving instruments in 780 counties but their unequal distribution puts the law of averages to naught. (See illustrations on page 17, this issue.)

While there are 2,500 wireless outfits on farms in Saratoga County, it is estimated that there are only 5,502 receiving sets, all told, in 37 agricultural counties in New York. Similarly freakish is the situation in Kansas, where the estimated 2,054 radio-telephones in rural areas are concentrated in a few counties. Fifty-one counties in Texas report farm ownership of 3,085 instruments for the reception of music and speech. Forty-three counties in Illinois are said to have installed 2,814 receiving sets; 26 counties in Missouri, 2,861 units; 42 counties in Ohio, 2,620 outfits; 40 counties in Iowa, 2,463 radio-telephones. New Jersey, Pennsylvania, Michigan and Minnesota have each installed between 1,000 and 2,000 wireless sets on farms.

Like our present economic ills, the reasons assigned for the uneven distribution of radio-telephones in the countryside are multiple. William F. Johnston, of Cadillac, Michigan, says: "Farmers in this county with 18-cent potatoes as their main cash crop are not yet in the position to take advantage of radio." J. L. Kroker, of Beulah, Michigan, thinks it is incongruous to hope for an expansion of radio-telephony when government radio telegraph stations and radio-equipped boats in Lake Michigan are dispensing "mush," "harmonics," and other forms of interference.

The manufacturers of radio equipment may well take a cue from the prospective buyers of receiving sets in rural communities who are delaying their purchases in hopes of refinements of the instruments and the cheapening of the price. The county agricultural agent of Frederick County, Virginia, writes: "Most of the farmers feel that radio is about to be greatly improved, hence are postponing purchases." A. Walton Litz, county agricultural agent of Savannah, Tennessee, indicates that the tillers of the soil in this area, located 32 miles from a railroad, would like to avail themselves of the advantages of radio but the prevailing prices of instruments are prohibitive. "The cost of radio sets is too high for farmers to invest," wails another county agricultural agent.

The leader of farm thought in Seneca County, New York, blames the present economic conditions for the limited popularity of radio-telephones on farms. The agricultural agent of Kent County, Maryland, writes in a similar vein when he reports "as soon as farmers receive fair returns for labor and investment they will buy sets." "Continued adverse crop conditions, drouth, hail and floods have conspired against the farmers' efforts for so many years that they are in no condition to buy anything that they can possibly get along without," reports C. H. Guernsey, agricultural agent of Custer County, Oklahoma. The distance intervening between the broadcasting stations and the receiving outfits is a condition held responsible for the limited use of radio in Ellis County, Oklahoma. Cut-over lands, seemingly a strange reason, is blamed for the lack of expansion of radio-telephony in Forest County, Wisconsin. That is to say the farmers are struggling financially in an attempt to develop this area not used to cultivation. A sparsely settled community and a cattle industry suffering from depression are conditions that have retarded radio development in portions of Oklahoma.

The disturbing factors, however, are not overwhelming in these testimonials. E. L. McIntosh, Seneca, Kansas, writes: "I have owned and operated a good radio outfit for over a year and find it to be very practical and valuable. I have run a bulletin board for farmers nearly a year." One county agricultural agent used his radio equipment as a medium for receiving the prices of cotton and in warning of the approach of freezing weather conditions. He suggests a public receiving station, provided with a loud-speaking device, as a means of stimulating interest in wireless telephony. "I hope the time is near when every farmer will be able to have a radio outfit in his house, as no other factor can bring the farmers living in these mountains in better touch with the outside world than a radio outfit," writes J. A. Wolfram, of Webster Springs, West Virginia.

"I think radio is one of the greatest things for farmers that has ever been invented," declares Alfred Tate, of Waterloo, Illinois. "I believe radio is yet in its infancy so far as its value to the farmer is concerned," contemplates Cecil L. McFadden, of Emporia, Kansas, who owns a $150 wireless receiving outfit. "Is the selling price as low as the production costs warrant," inquires R. S. Clark, of Huntington, Pennsylvania. "If so, its field is almost excluded to farmers of our county," warns this agricultural leader. Amusement is said to be the chief use of radio in Gloucester, Virginia. "Entertainment features, especially music, about all the average farmer cares for," indicates J. W. Jennings, of Lubbock, Texas. Another county agricultural agent in Indiana states that radio will never be used to any considerable extent until there is some regulation as to the wave lengths.

The committee representing the United States Department of Agriculture, consisting of E. B. Smith, chairman; W. A. Wheeler, Bruce Ashby and L. H. Goddard, mailed out this radio questionnaire to 2,212 county agricultural agents. All told, 1,205 made responses, five of them, however, returning the blank in the form in which it was received. Of these 1,200 county agents filing replies, 86 owned receiving sets, 488 had access to such instruments, while 588 were not in touch with this medium of communication. All told 483 of these county agents had received market reports by radio; 330 had not received any such reports, while 386 agents failed to answer this question. Four hundred and ninety-one county agents had heard weather reports by radio; 315 were not so fortunate, whereas 394 failed to respond to this question.

Strange to say, only 715 of these 1,200 county agricultural agents—leaders of thought in the respective agricultural communities which they serve—had positive convictions as to the value of radio-telephony. Here is an opportunity for missionary work by radio manufcturers, namely, converting the 221 agents who did not believe radio

to be of value to farmers. Also it is reasonable to assume that the 264 other agricultural agents who failed to respond to this question are doubtful as to the merits of this speedy vehicle of intelligence in the countryside.

Despite this apparent adverse attitude toward radio on the part of 485 county agricultural agents—representatives of scientific agriculture and leaders in their respective communities—C. B. Smith, chief of the Extension Service of the United States Department of Agriculture and the titular head of this army of farming representatives afield, favors the encouragement of the use of radio on farms as an extension project. His significant statement, which was furnished to the writer, follows:

"We are inclined to believe, therefore, that a reasonable extension of radio receiving sets in rural districts may properly be encouraged by extension forces. Any movement of this kind probably should be through the encouragement of our own extension staffs at the colleges to own instruments. We will then be in position in the light of our own experience to encourage county agents to put in such sets. The county agents will then be in position, based on their experience, to encourage project leaders to put in sets and thus radio will gradually be extended until there will be farmers in practically every community who will regularly be receiving market news, weather service and other information from the colleges and this department which has a bearing on agriculture and rural life, and in addition will be getting from radio a vast amount of satisfaction and entertainment for the farm family from commercial and private sources.

"From the department's standpoint I would say that we are regularly furnishing market news and weather service to all sections of the country. We are also furnishing a substantial amount of information through 'agriograms' brief items on various phases of agriculture and broadcast from many stations.

"Private organizations and commercial institutions as well as the colleges are broadcasting lectures, music and other forms of entertainment. It would appear also that very satisfactory two-tube receiving sets are now on the market at a price of $75 or less which are capable of receiving messages over very substantial distances.

"Seven hundred and eighty county agents, who made an estimate as to the number of radio receiving sets owned by farmers in their respective counties, reported a total of 39,869. If this ratio holds good throughout the country it would appear that about 145,000 farm families have availed themselves of this means of keeping in touch with the outside world. Seven hundred and fifteen of the agents reported that they believed the radio receiving set has now reached such a stage of perfection that farmers could quite generally find a substantial source of satisfaction through this means of keeping in touch with the world; 221 agents were doubtful as to this, while 264 made no reply."

Broadcasters Like to Know—Have to Know

BROADCAST listeners are taking too much for granted. They hear a program, like it, and then wonder why they never hear it again. The reason is in themselves. The stations do all they can to have the entertainment that most pleases the listeners. What are the listeners doing for the broadcasters? Nothing, unless they at least drop a line or two commenting on the program. If you hear something that you like, say so by mail. A hundred penny postal cards cost just one dollar, and will bring you many dollars worth of the kind of entertainment you want. Broadcasting costs you nothing—the least you can do is tell the men responsible for your pleasant entertainment that you are pleased.

Radio Primer for New Enthusiasts

By Lynn Brooks

B BATTERIES—We have considered in the past the use of batteries for the supplying of the filament current only. There is another important function of a battery in a tube set, which is supplying the necessary high tension for the plate circuit.

In this part of the circuit dry batteries generally are used. They are employed to a greater general extent than are storage cells, although both types may be used. We will consider dry cells first, as they are more easily and handily used by the beginner in radio.

In order to supply the high tension necessary, of course a great number of cells must be used. As every cell of a dry battery will furnish 1.5 volts it need not be a large cell, but one of the small ones, ¾" or smaller in diameter and about 1" or 1½" long. Amperage is not necessary so the cells can be small. What is needed is voltage and that can be obtained by hooking up a number of them in series.

They are made up in blocks of 22½ volts or 45 volts, both in large or small sizes, the difference being that the large size is made of the larger cells and will of course last longer and give steadier service over longer periods of use.

The larger batteries are generally tapped to allow a variable voltage to be placed on the plate of the detector. This voltage varies between 16 volts and 22½ volts and allows the best operating voltage of a given tube to be used.

The same method of manufacture is used in the cells used in these batteries as in the larger ones (No. 6 commercial) used for filament current. The ingredients are the same, the only difference being that of size. The many small cells are placed in a cardboard or metal container, separated from each other by waxed empire paper, or waxed cardboard and are connected in series. They are then covered with a sealing compound, and the outside is given a generous coat of either bee's-wax or paraffin.

If tapping is to be done, the cells are tapped when they are being connected, and the lugs for the binding posts allowed to project through the top of the sealing wax.

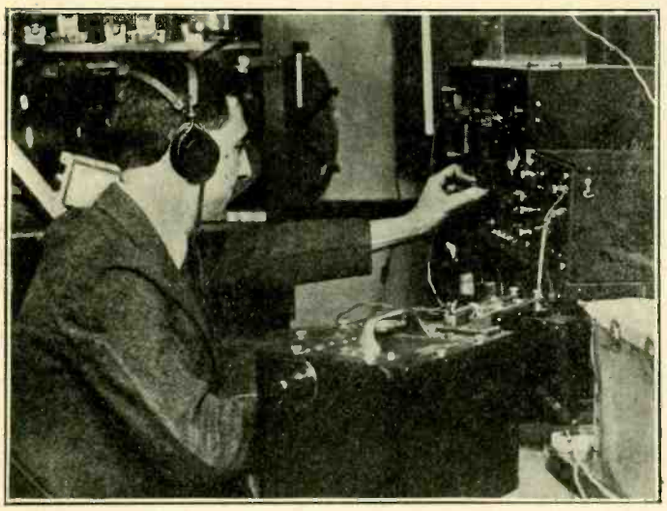
In the better grade of batteries, the outside instead of being heavy cardboard is pressed metal, which offers much better resistance to pressure or chemicals, and gives the added assurance that moisture cannot leak or seep through. The metal covering also adds to the appearance as well as the life of the battery, as it does not allow the moisture of the outside air to get through and corrode the batteries.

Many fans will ask why it is that a B battery, with its low current value, will often outlast many charges of a storage A battery. In the average regenerative detector circuit, the current passed will generally measure about. 5 milliamps. on a strong signal, seldom going up above .7 unless an extremely sensitive tube is being used with probably excessive filament current, causing the tube to oscillate violently and passing an almost continuous stream of electrons. It is for that reason a battery which has little amperage and very high voltage may be used. As it has no direct circuit and only passes an extremely small amount, it accordingly lasts a much longer time.

These batteries generally last about four months of good, hard use, and much longer use when not used continuously. Some of the better type have been known to last in service for sixteen or eighteen months before showing any appreciable wear. This, however, is exceptional and should not be taken as a standard. If you get from four to six months' good use from an ordinary B battery, and about nine months' intermittent use, you can be willing to throw it away and purchase others.

RADIOGRAMS

WORLD NEWS HAPPENINGS BRIEFLY PHRASED FOR OUR BUSY READERS



(C. Fotograms, N. Y.)

F. W. Dunmore, scientist of the U. S. Bureau of Standards, measuring the transmitted frequency of a broadcasting station. By keeping the stations on their allocated frequency the interference between stations is reduced.

(C. Photo News, N. Y.)

The Bedford Branch, Y. M. C. A., Brooklyn, N. Y., has started a radio class for women.. J. Peterson, the class instructor, is shown explaining to five interested members of the class the theory of the vacuum tube.

Now that the microphone has made audible the hum of other insects' wings it remains for science only to devise a silencer for the mosquito.—New York Tribune.

* * *

Senator Paul Dupuy, who recently spoke jointly from Station WJY, operating on 500 watts, and WGY, was heard in cities in France, and his speech was recived perfectly in Milan, Italy.

* * *

Three hundred and forty-one million electric lamps, or nearly a million a day, were made in the United States during 1923, establishing a new high record for the industry, says the New York State Committee on Public Utility Information. This is 36,000,000 more than were made in 1922, and 6,000,000 more than were made in 1920, the previous record year.

* * *

The British Cabinet having recently approved the final draft of the King's speech, considered whether permission should be given for broadcasting it by wireless and decided that this could not be granted. It was felt strongly by many ministers that the first speech of His Majesty to be broadcast should be on some question of vital national importance, and entirely of non-party character.

Many a husband of a "loud speaker" is in favor of a "silent night."—The Pathfinder.

* * *

It's tough to be in a crowd of radio and Mah Jong fans when you understand only English.—Brooklyn Eagle.

* * *

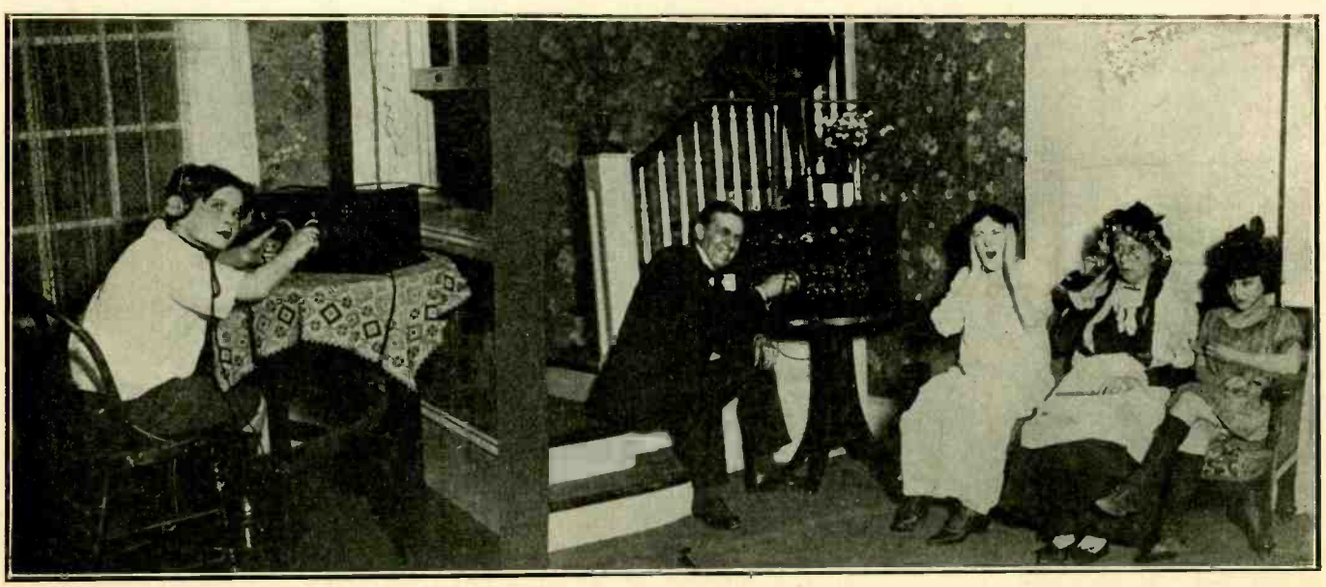
John V. L. Hogan, the well known consulting radio engineer, recently remarked: "The present radio situation reminds me of a man deaf, dumb and blind trying to drive a complicated automobile in Broadway traffic."

* * *

In Lewisburg, W. Va., the Lewisburg & Ronceverte Electric Railway Company has installed a radio receiving set in the main waiting room. According to L. S. Davidson, general agent of the company, the radio music has been greatly enjoyed by waiting passengers.

* * *

The results of the Olympic winter sports competition at Chamonix will be made known to the world by the Eiffel Tower broadcasting station in Paris for announcing the results, and at night a full summary will be given. Two other powerful stations also will give the results. A special corps of interpreters will be employed.



(C. Foto Topics)

Composite photograph showing the effect that the little boy with the "dial twisting habit" and the single tube, single circuit howler is having on the world at large. Mr. Businessman and his family, at home for the evening, expect to enjoy a nice program from the local station. It happens that there is a wonderful vocal program on. Do they hear it? Not if little Willie Distance-on-One-Tube has anything to say. He just turns up his tube and goes hunting, to the evident disgust of the neighbors, whose reception is ruined. When such performances as are nightly being given by the party on the left of the picture cease, then reception will be a pleasure instead of a horror. (Posed through the courtesy of the Equity Players, 48th Street Theatre.)

Advantages of Loop Antennae

By Byrt C. Caldwell

THE time is undoubtedly soon coming when we shall no longer see the roofs of the houses about us strung with wires which lead to some radio fan's set. Outdoor antennae are subject to many disadvantages, which we can put up with today, but which will be too great for the future fan. He will use

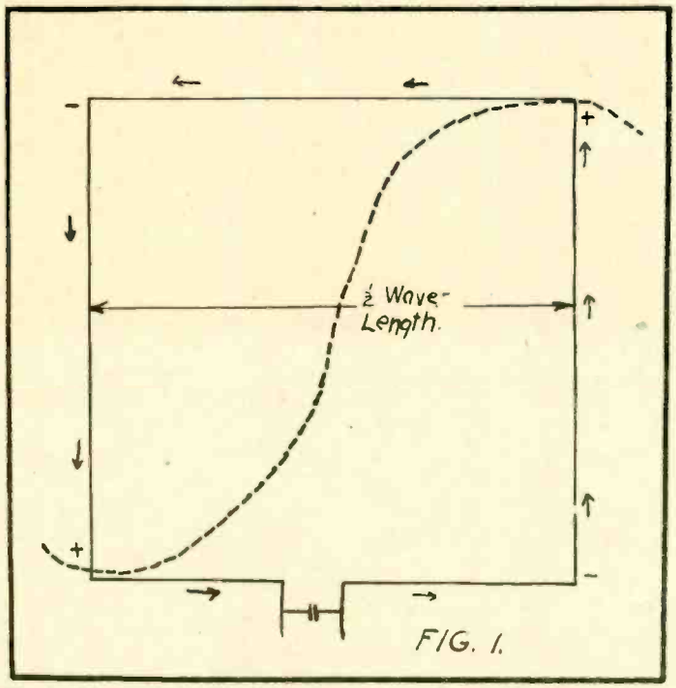


Fig. 1. Diagrammatic illustration of the theoretical explanation of why a loop antenna receives best when pointed in the direction of the transmitting station.

nothing but indoor antennae, and with them he will obtain far better results, with the same number of tubes, as do we with our outdoor aerials. The antenna of the future will probably be a loop in some shape or other. The loop, today, is the most satisfactory of indoor antennae. The future set used will probably be some form of the super-regenerative.

The outdoor aerial has some advantages over the

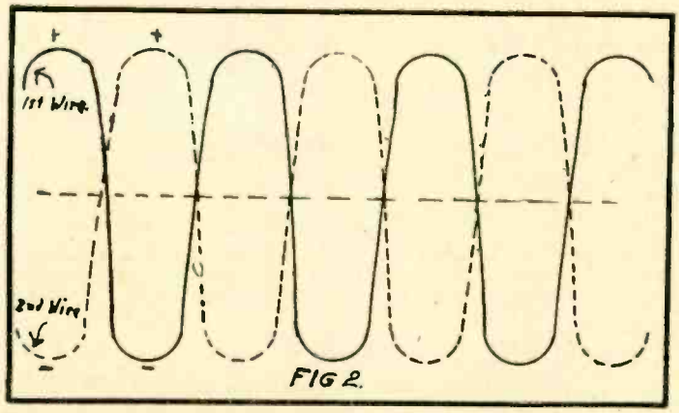


Fig. 2. Curves showing current flow in two wires of a loop when they are placed at an angle of 90° to an approaching radio-frequency wave.

loop, chief of which is its greater efficiency as compared with the loop. It has many disadvantages also. Static is much more bothersome in a set using an outdoor antenna than it is with one using a loop. The great length of some aerials makes sharp tuning a difficulty. With a loop, the directional effect greatly increases the sharpness of tuning. It also helps to eliminate static. The greatly decreased audibility of the loop set also increases the selectivity of the circuit. With a loop, practically no energy is radiated far enough to interfere with other sets. Even today, the person who uses a loop, and who has a fairly powerful set, gets far more satisfaction than does the person with an outdoor antenna. With all this in mind, it is well to understand the operation of the loop in the receiving set.

The loop does not act in the same manner as does the outdoor antenna. While the latter may be considered as a condenser, the loop is simply an inductance coil. The action of the loop may be explained in two ways, both of which seem likely. In the first, we can imagine a large loop, (Figs. 1 and 3) where the distance between the two vertical wires is equal to one-half the wave length of the received signal. When the loop is placed so that the plane of the loop is perpendicular to the approaching wave front, as in Fig. 1, the wave striking one wire first, induces a current in it, which is positive at the top of the wire. The potential is in the direction of the arrows. One

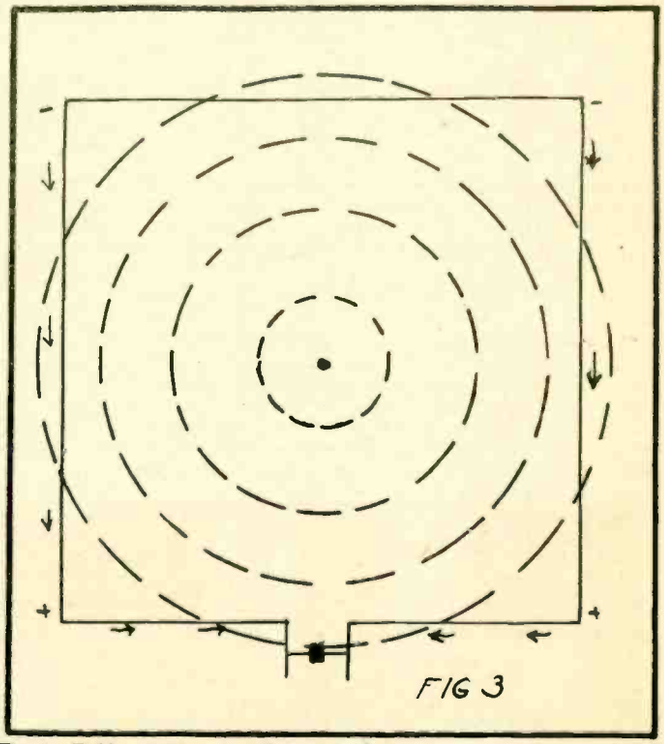


Fig. 3. Field current surrounding a simple loop antenna, when placed parallel to the approaching wave. The currents induced in the wires being of the same polarity, oppose each other, and thus no sound is heard, as no current is flowing in the grid circuit.

full wave length later, the potential of the first wire is again positive at the top, and the wave, advancing, at the same time induces a current in the second wire, but the positive potential is at the bottom. The potential is in the direction of the arrows, and we, therefore, see that, as both potentials are in the same direction, a current flows in the circuit. The curve in Fig. 2 shows the current flow in the two wires. Each wire is alternately positive, and alternately negative, at the ends. The emf.'s are 180° out of phase, and a current flows. When the loop is placed parallel to the approaching wave front, the wave, striking both

wires at once, induces a positive emf. in both wires at the same time, and at the same end. The potentials then oppose each other, and no current flows. This is shown in Fig. 3. The curve of Fig. 4 shows the emf.'s in both wires. Both are positive at the same time, and so oppose each other.

The second explanation is that the loop acts the same as the rotor in a variocoupler. The transmitting station may be considered as the stator of the coupler. As in Fig. 5, when the loop is pointed toward the station, the coupling is at a maximum and the maximum current flows in the system. When the loop is placed at right angles to this position, the coupling is zero and no current flows.

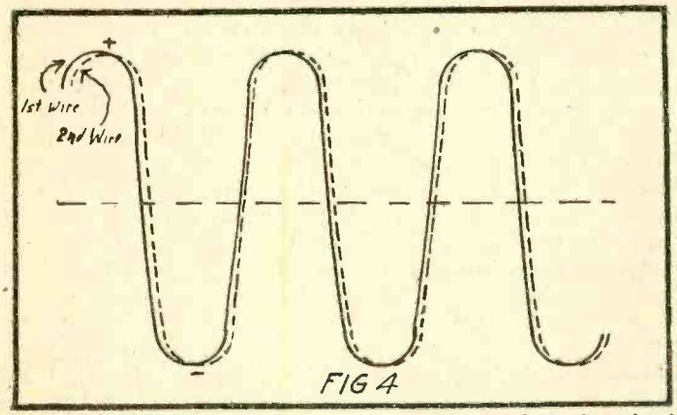


Fig. 4. Curves showing current flow in two wires of a loop when placed facing an approaching radio-frequency wave. The current induced in both wires is the same, inducing identical currents which oppose each other.

The dimensions for the construction of a good loop are given in the diagram in Fig. 6. The solenoid type of loop is more satisfactory than the flat type. The dimensions given need not be adhered to, but it should be remembered that if a larger loop is used, the number of turns must be less. The distance between the wires is quite important. In the loop shown, the distance between each wire should be ⅛" and there should be 15 to 20 turns. If the loop is made larger, the distance between the turns should be greater. The loop may be made so that it can be swung about in different directions. If a pointer is then placed on the loop, and a map of the different stations is used, the fun of radio is increased a hundred per cent. You can point your loop in the direction of the station you want and, if your set is good enough, you will hear him come in loud and clear, and as you swing the loop, he will fade out and other stations will come in.

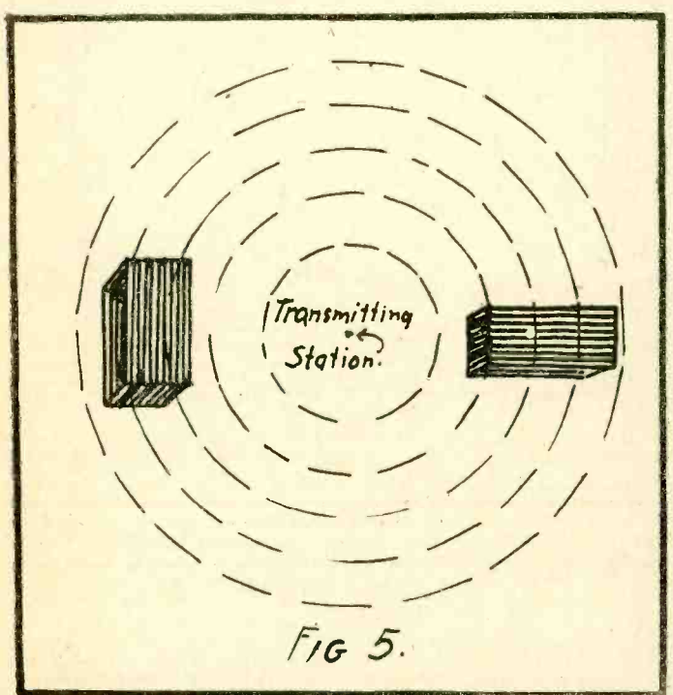


Fig. 5. Schematic representation of two loops in the field of a transmitting station's radio-frequency wave. The one on the left is not in a receptive condition as the current induced in it is nil. That on the right is receiving current at its full intensity.

A loop will not operate successfully with a crystal, unless you are within a short distance of a powerful station. The loop should be used only with a tube set. You cannot expect to receive from as great distances as you can with an outdoor antenna, but the many advantages which the loop possesses, make it well worth anybody's while to dispose of the former in favor of the loop, and if you use one of the super-regenerative sets or one of the reflex sets, it is quite possible to obtain results which equal those obtained on an outdoor antenna, with a plain regenerative set. The days of the outdoor antenna are numbered. Make yourself a loop, and be one of the first to dispose of them.

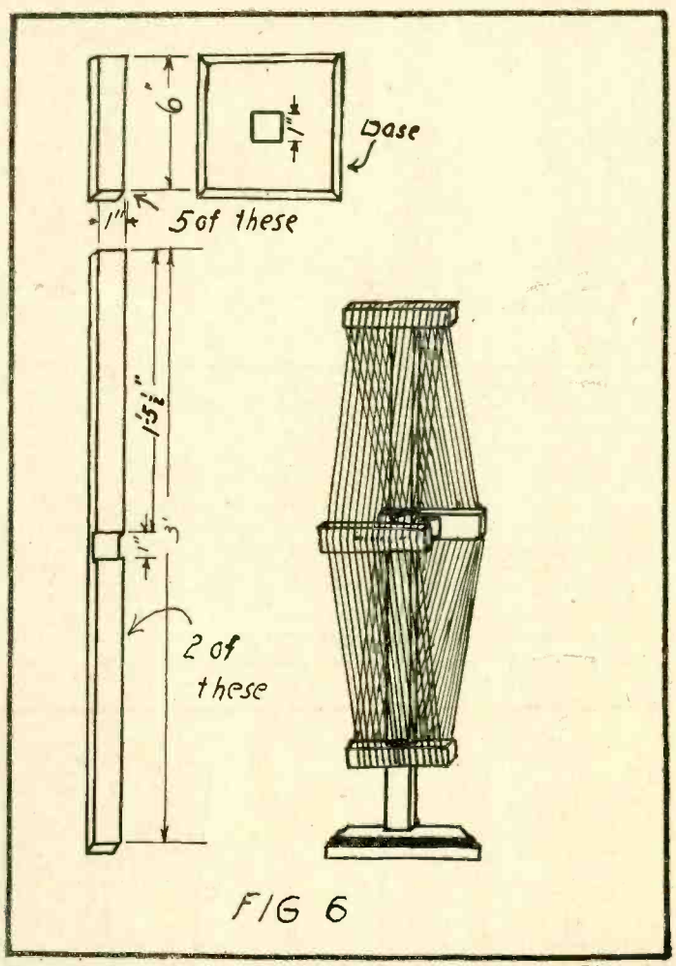


Fig. 6. Diagram of a loop suitable for use on a receiving set. Dimensions for the standards necessary for the building of this loop are also given.

Important to Radio World Subscribers

You will note by the wrapper on RADIO WORLD each week that the expiration date is given. If your subscription expires with the issue dated April 1, 1924, this expiration will be designated on the wrapper thus: 4/1/24.

Please keep track of these dates and send in your renewal before you receive the last number on your old subscription, and thus be sure of keeping your file of RADIO WORLD complete.

The Radio University

A Question and Answer Department conducted by the Technical Staff of RADIO WORLD for the information and instruction of its subscribers.

Please advise me how to overcome the squeals of another's radio receiving set. My friend has an antenna running at right angles to mine, but at the same time, we cause squeals to each other's receivers. How can we overcome this?—S. S. Schwartz, 710 Broadway, Schenectady, N. Y.

In order to do this, if both sets are regenerative, it will be necessary for both of you to incorporate a form of radio-frequency choke circuit, as outlined in RADIO WORLD for December 8, in the article by C. White, entitled "How to Stop Re-radiation in Single Circuit Receivers." If one only incorporates this device, it will not be of much use, as the radiated wave of another nearby receiver will "beat" on the carrier wave of the transmitting station and cause interference also, so both must use the method.

* * *

I desire to build the radio-frequency receiver as outlined by A. E. Herron in a recent number of RADIO WORLD. *How should the variometer be connected in the circuit, and what is the best relative location of the apparatus? Do you have to load variometer for high waves? Can a loop be used with this receiver? What B battery voltage should I use on UV199 tubes? Will a 400-ohm potentiometer work as well as a 200 ohm one? Is shielding necessary?—W. E. Beckham, Badin, N. C.*

The variometer is connected between the plate-grid side and the B plus of the battery. There is no location specified—experiment and find out. It is not good practice to use a set of this type for long waves, and should not prove necessary, as no broadcast stations are now working over 600 meters. A loop may be used. 90 volts. Yes. No. We cannot answer your other questions, as they refer to competitive apparatus sold on the open market. Needless to say the best is always the cheapest, and circuit diagrams always come with most of them, showing the way they should be connected properly.

* * *

In RADIO WORLD *for August 25th, 1923, you give information for the addition of one stage of radio-frequency to the R-C receiver. Where can I get a picture diagram of the connections for this apparatus, as I do not understand the technical diagrams or descriptions?—A. Golden, 3501 Mermaid Avenue, Brooklyn, N. Y.*

We do not furnish picture diagrams. The diagram is perfectly plain and is all marked as to apparatus. Take it to someone that understands diagrams and let him figure it out for you.

* * *

In tuned radio-frequency amplification, where they specify honeycomb coils, is it possible to use ordinary tapped or wound coils? If so, what size should they be?—H. E. Hill, The Sunday Telegram, Albany, N. Y.

You may use the coils you mention. For ordinary purposes, to cover the regular broadcast waves, a 40-turn coil tapped at 20 and the end, and shunted by a 23-plate condenser will suffice.

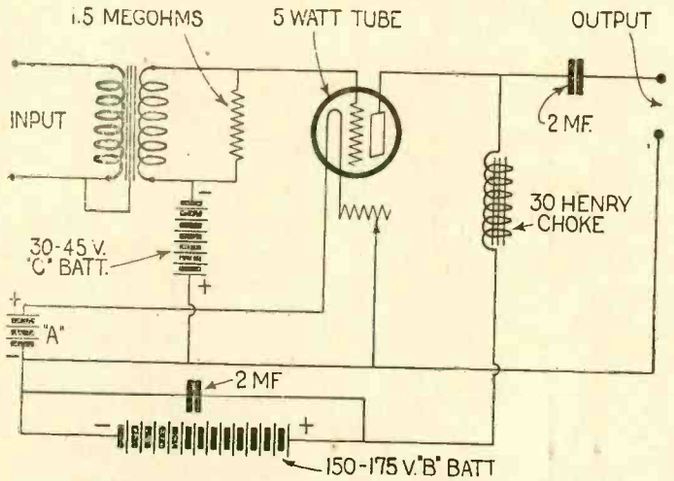
* * *

I constructed a receiver from parts furnished by the Erla Laboratories. It is a three-tube set, using a loop for antenna. Due to the fact that I had a 7"x9" panel I used it for the receiver, which necessitated some very short leads, and crowded the panel and base somewhat. My trouble lies in extremely broad tuning and a lot of squeals and howls. Can the crowding of the apparatus be the cause? I have two potentiometers, but find that there is only space for one in the circuit. Where does the additional one go? Circuit is their three-tube reflex?—Charles J. Calpone, Bradford, Pa.

For proper spacing of parts, this receiver should be constructed on a panel at least 7x18". A 24" panel would be even better. The crowding of your apparatus is responsible for the trouble you are experiencing. One potentiometrer is all that is necessary, and it is an evident mistake that the other one was included. The potentiometer is placed across the filament leads of the first tube. Remake your set, using a larger panel, and allowing ample space for all the apparatus. Do not crowd it.

* * *

Would adding one stage of audio-frequency to a three-tube reflex receiver hurt the working of the circuit? If it is added should I use the UV200 or the UV201A tubes. What is the best loud speaker for operation on a reflex circuit? What causes a rattle in an ordinary talker made of a loud talking phone unit and a phonograph horn? Can this be eliminated? How?—Leonard Getz, Montreal, Canada.



A single tube power amplifier which may be used as a third stage of audio-frequency amplification. Circuit published in answer to query of L. Getz.

The addition of an extra tube to the output of a reflex such as you mention would not hurt its working. Use either the UV201 or the UV201A tube, or a 5-watt power tube, such as the 216A tube. A suitable diagram for a stage of power amplification is herewith given. This will allow amplification without distortion on any receiver and can be accommodated to the purpose you mention. Suggest that you make this up on a separate panel, so as to be able to accommodate it to any receiver. We cannot answer your question as it refers to competitive apparatus sold on the open market. The rattle you note is caused by the diaphragm of the phones hitting the poles of the magnets. A way of getting away from this is by cutting a thin washer of light cardboard or heavy paper, just the size of the phone rim, and about ¼" wide. Place this on the rim of the cap, place the diaphragm of the phone over it, then screw on the ear piece. This will keep the diaphragm from hitting the pole pieces and thus rattling.

* * *

Some one informed me that my receiver (single circuit Colpitts, using variometer as tuner) was creating interference for which I could be arrested, as I was operating a transmitter. I do not use it to talk with. Can they do as my friends say they can?—D. Santignato, Vesey Street, New York City.

You cannot be arrested for operating a re-radiating receiver. However, for the peace of the neighborhood, would advise you to change it over to a receiver that does not cause the interference this one does.

* * *

In RADIO WORLD *for January 12, 1924, Byrt C. Caldwell described a single control DX receiver. How is the filament controlled in this set? He doesn't show any rheostat. Can I use a 50 turn honeycomb coil instead of the coil he mentions?—F. J. Capone, 515 La Salle St., Berwick, Pa.*

In the article the author mentions that instead of using a rheostat to control the tube, a single dry cell is placed in the circuit without a rheostat and that runs the tube. This is not to be done without experimenting however, as very often 1.5 volts is too much for a dry cell tube, and they operate best on less than that. Suggest that you use a rheostat for best results as the set is liable to oscillate too violently when the full 1.5 volts are used on the tube. Yes, you may use the coil in place of the one specified.

* * *

I am building the Superdyne receiver and want to know if the four-turn, aperiodic primary is wound directly over the secondary or is there a space such as a lining of paper or cloth between? F. Jeleneck, 40 Worthington Street, Winfield, New York.

The primary winding is wound directly over the secondary, and the four turns are spaced ¼" so that they will cover 1" of space on the winding.

* * *

I have the Atwater Kent set, using the coupled tuner and three tubes (WD12) but cannot seem to get below 200 meters or above 450. My antenna is 150 ft. long. What do you think can be the trouble?— J. H. H. F., 7 Melbourne Ave., Hudson Falls, N. Y.

We cannot diognose your trouble without seeing at least a circuit diagram of your set. With the parts you mention, you should have no trouble in getting the higher wave stations, as the coupled circuit tuner goes up to 600 meters which is enough for all broadcasting stations operating now.

* * *

I have a single circuit receiver (regenerative) with two stages of audio-frequency amplification. I have had the following trouble lately which I cannot seem to understand. For a while the set will work properly, then for no reason at all the tube spills no matter how I tune it. The set works right for a period of about a week, then goes on a strike for a period. What causes this?—G. W. Anderson, Fairmont, W. Va.

There are several things that could cause the trouble you note. Sometimes moisture coats the insulators and insulation of the receiver and causes this. You will probably note that this spilling will occur during a time when the air is rather moist. Another thing that will cause it is the operation of other single circuits sets in your neighborhood which cause to be disturbed the fine balance necessary to keep the set non-oscillating and makes your set spill. The fact that you now have to turn your filament up further to get signals is probably due to the tube wearing down, the filament getting thinner, and more current being necessary in order to bring the tube to a sensitive condition.

* * *

Enclosed is a single circuit diagram that I am using. Will you be kind enough to check it up and see if everything is O. K.? Can you suggest anything to improve it? Also please check the best battery arrangement, of which I have included four of the types that I have seen.—R. Adams, Kalamazoo Loose Leaf Binder Co., Kalamazoo, Mich.

The diagram as you enclose it is perfectly correct, with one exception. Suggest that you take the grid return off the plus side of the A battery instead of the minus side of the circuit as you have it. As the various methods of connecting the A and B battery minus leads, we refer you to the article appearing on pages 14-15 of RADIO WORLD for September 22, 1923. Mr. Anderson gives very explicit reasons for the various connections, which are too numerous to explain here. There are some eight or ten methods of getting the correct potential on the grid, and he explains the methods used and their advantages and disadvantages.

* * *

Several writers recommend the use of the cartridge regulators for controlling the filament of receivers. I am going to construct the "Superdyne" receiver and want to know if I can use these on the UV199 tubes. Are they efficient?—William Kennelly, Minneapolis, Minn.

These amperites, as they are called, are all right for controlling the filaments of tubes that do not need adjustment. You may use them in the radio-frequency or audio-frequency circuits, but retain the filament rheostat of the detector circuit. This is because the detector is rather critical as to the filament current and has to be heated to a certain temperature for its best working, which is determined by the clarity and volume of signals. They are efficient to a great degree in the control of filament current in the audio-frequency amplification circuits.

* * *

In RADIO WORLD *for December 29, 1923, you publish an article by C. White. On what type frame should the loop be wound, the flat spirals, or the hollow solenoid type? What make of potentiometer should I use? How is it possible to separate the wires from the loop and at the same time arrange it so that the loop can rotate? Would sliding contacts lessen the efficiency of this set?—E. K. Southwick, 1051 Springfiela Ave., Irvington, N. J.*

For best results the loop should be the flat spiral type. Any good make of the resistance named will do, there are any number of good ones on the market. This can be done by making the loop set in a standard which revolves in a solid base. Take off flexible leads from the bottom of the standard. Bring the tapped leads down the center standard crosspiece. Yes. They are not to be employed in any radio circuits where they can possibly be avoided, as they put resistance into the circuit. Use flexible leads.

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FEBRUARY 2, 1924

Thrills By Radio

THAT was a tremendous contest between the elements and the giant dirigible airship "Shenandoah" when she was torn from her mooring mast by a howling seventy-mile gale and tossed about in the upper air for eight hours. The game was played between the forces of Nature and the engineering skill of man. The stakes were twenty-two human lives and a $5,000,000 structure. In spite of the fact that the accident happened in a fraction of a second and practically without warning, human skill, grit and discipline won, and the great airship was piloted safely back to her hangar after a battle made all the more dangerous by her damaged condition. It will go down in history with the many other remarkable achievements of our navy.

But the outstanding feature of this exciting episode is that any one listening in at a receiving set within hundreds of miles of the scene of the accident could hear the bulletins frequently sent out by the "Shenandoah's" radio operator. All broadcasting stations on the eastern coast stopped sending their regular programs and gave the "Shenandoah" clear air for her messages. Once in a while a broadcaster would send an encouraging word to the air ship. After the first few minutes, during which the "Shenandoah" was gotten under control for her flight before the storm, her radio man sent out many messages, most of which were heard by thousands of amateur listeners-in. That, indeed, was a thrill for those who kept the "ear muffs" clamped on during this exciting period. An editorial writer for the New York "Times" devoted nearly a column to this unusual occurrence, in the course of which he said:

"We shall find that people overseas heard of the 'Shenandoah's' danger. Jules Verne, with all his genius for harnessing science to the imagination, never fancied multitudes of people witnessing, through the sense of hearing, a battle for life by the crew of an airship, blown about in the night by tempestuous winds. His fictions anticipated wonderful discoveries in aerial and submarine navigation, but the miracle of 'radio' was beyond his ken."

The Grid Condenser

TOO little attention is paid to grid condenser by the average amateur. Usually he goes out and picks up one for a price ranging anywhere from ten to twenty-five cents, connects it into the circuit and forgets about it. When trouble arises, the grid condenser is usually the last thing considered when, in fact, it is the cause of most of the trouble. In the first place, unless space is a vital consideration, the grid condenser should never be of the fixed type. It should instead consist of a 7 or 11 plate variable condenser of a well made type. The ends should be of bakelite and not of the composition commonly known as "mud." The condenser need not have a vernier attached as the adjustment of it will not be critical. Aside from the fact that such a variable condenser will usually eliminate the difficulties found with the standard type of cheap fixed condenser, it will be found that in "DX" reception, a station can very often be brought in clear by varying the condenser where with the fixed condenser, the signals would be "mushed up" or indistinct. Taken as a whole, the substitution of a small variable condenser for the usual small fixed condenser will be a great asset to any standard receiving set.

Potency of the Broadcaster

THE latent power for influencing a great mass of the people instantly, possessed by a broadcasting station or a group of stations hooked together, has been referred to in these columns on several occasions. In a time of great emergency, such as a call to arms or the destruction of a city by fire or warning of a flood, the broadcasters would be instantly available to notify all the people of the peril of the few or to summon men promptly to the colors.

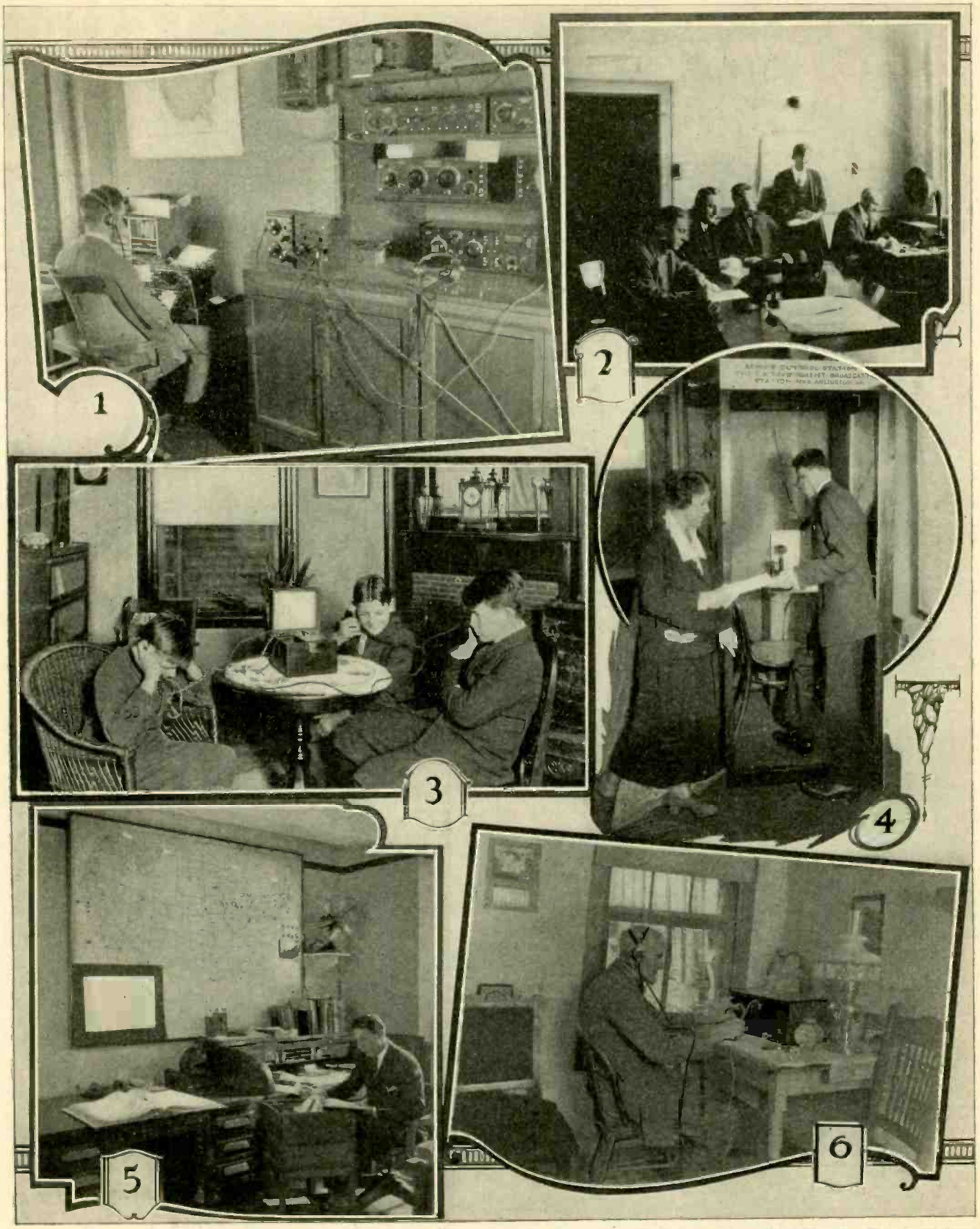
As we approach a presidential campaign the power of the broadcaster in politics is rapidly sensed by those professionals who keep an ear to the ground to learn, in this case, what is going on in the air. We are informed on the highest authority that politicians and even statesmen in Washington lately have been in the habit of receiving promptly and with exceptional courtesy the visits of those officially connected with the broadcasting phase of radio. They realize in the prompt manner characteristic of the good politician that here is an agency of marvelous possibilities ready to use and whose practicability has been thoroughly demonstrated. Also they have figured out for themselves that it is a two-edged sword—that it holds a negative as well as a positive influence. The politician's appreciation of the power of broadcasting places at once an added responsibility on the broadcaster, for he must see to it that this power is not misused nor made available for an unworthy cause.

An editorial writer in the "Christian Science Monitor" not long ago was hoping for the ultimate abandonment of war and was decrying the invention of new weapons of offense and defense. In the course of the editorial he said: "Radio is only in its infancy. Ere long it will be an instrument of incredible potency in the creation of opinion, for noble or ignoble ends." And he is justified in his phophecy.

There is not the slightest doubt that President Coolidge made hundreds of thousands of new friends and adherents by broadcasting his message to Congress and his eulogy to the late President Harding. Those who knew him by his record and by the printed accounts of his public service felt a more intimate acquaintanceship after hearing his voice. Without question President Coolidge is nearer to the people of the United States than any other president ever has been—and this principally because so many have heard his voice.

When the matter is analyzed it is quite clear that with the extension of broadcasting service the responsibilities of those in charge of this most potent influence correspondingly increase.

Government Radio Helps the Farmer



1—A corner of the radio room of the Radio Market News Service Bureau, U. S. Department of Agriculture. Stenographer copying radio reports direct on a stencil for general distribution later. 2—Board room of a modern country bank at Raymond, Ill., where the directors are getting market reports from the air, via a modern receiver with loud speaker. 3—But radio is not all market reports, as this photograph of three of the future tillers of the soil testifies. Their interest lies more in the football games and sports. 4—Remote control station of the Market News Service of the U. S. Department of Agriculture, where the reports are broadcast. It resembles a modern telephone booth and is controlled from a nearby broadcasting station. 5—J. C. Gilbert, in charge of the Market News Service which supplies the farmers with the news via radio. The map on the wall, studded with pins, represents the broadcasting stations handling the Market News Services. 6—Fifteen minutes at the receiver and Mr. Soil Tiller has the news that it used to take him days to find out via trading and the papers. This is even quicker than it appears in the daily newspapers. Then after chores are over he gets the latest prices for various essentials, and perhaps hears some good music. (See article on page 10, this issue.)

Here Are Good Broadcast Programs

Station WGI, Medford, Mass.

360 Meters (830 Kcys). E. S. T. Feb. 1—12:00 M.—Selection on the Ampico in the Chickering, Amrad Round Table, Selections on the Brunswick Console. 12:40 P. M.—New England weather forecast. 12:45 P. M.—Closing report on Farmers produce market report. 3:00 P. M.—Miss Dorothy H. Goodwin on "New England Toast Campaign." Brunswick Console. 3:30 P. M.—Miss Dorothy Dean, Dir. Metropolitan Division, Mass. Council of Girl Scouts. 5:30 P. M.—Closing stock market reports. Live stock market reports. 6:15 P. M.—Code practice, Lesson No. 226. 6:30 P. M.—Meeting of the Big Brother Amrad Club. 7:00 P. M.—Boston police reports. 7:30 P. M.—Selected verses by Mr. Charles L. H. Wagner, radio poet. Red Cross health talk by Henry Copley Green. 7:45 P. M.—Concert by Mr. George F. S. Pearce, violinist accompanied by the Ampico in the Chickering. 8:15 P. M.—Concert by the Christian Endeavor Society.

Feb. 2—6:30 P. M.—Meeting of the Big Brother Amrad Club. 6:45 P. M.—Code Practice, Lesson No. 227. 7:05 P. M.—New England weather forecast. New England crop notes. 7:30 P. M.—No. 44 of a series of talks on New England business problems by Arthur R. Curnick. Arthur Murray's course in ball room dancing by radiophone. Musicale.

Feb. 3—4:00 P. M.—"Adventure Hour," conducted by the Youth's Companion. Musicale by Mr. E. F. Orne and Friends. 8:30 P. M.—Talk on "World Unity," under the auspices of the Greater Boston Federation of Churches. Evening's musicale.

Station KDKA, East Pittsburgh, Pa.

326 Meters (920 Kcys.). E. S. T. Feb. 1.—9:45 A. M.—Union Live Stock market reports. 11:55 P. M.—Arlington time signals. 12:00 M.—Weather forecast. United States Bureau of Market reports. 12:10 P. M.—Concert by Broudy's Orchestra, from the dining room of Kaufmann's Pittsburgh, Pa. 6:15 P. M.—Organ recital by Lucile Hale from the Cameo Motion Picture Theatre, Pittsburgh, Pa. 7:15 P. M.—Radio Boy Scout meeting, conducted by the Scouts. 7:45 P. M.—The children's period. 8:00 P. M.—Market reports. 8:15 P. M.—The Sunday School lesson presented by Dr. R. L. Lanning. 8:30 P. M.—Concert by the St. Andrews Lutheran Quartet. 9:55 P. M.—Arlington time signals. Weather forecast.

Feb. 2.—9:45 Union Live Stock market reports. 11:55 A. M.—Arlington time signals. 12:00 M.—Weather forecast. United States Bureau of Market reports. 1:30 P. M.—Concert by Daugherty's Orchestra, from the dining room of McCreery & Company, Pittsburgh, Pa. 6:15 P. M.—Dinner concert by the Westinghouse Band, T. J. Vastine, conductor. 7:30 P. M.—"Bringing the World to America," prepared by Our World. 7:45 P. M.—With the Dreamtime Lady in Storyland. 8:00 P. M.—Feature. 8:15 P. M.—"The Consumer's Dollar," Paul D. Converse, Professor of Commerce, University of Pittsburgh. 8:30 P. M.—Concert by the Westinghouse Band. T. J. Vastine, conductor. 9:55 P. M.—Arlington time signals. Weather forecast.

Station WBZ, Springfield, Mass.

337 Meters (890 Kcys.). E. S. T. Feb. 1.—11:55 A. M.—Arlington time signals; weather reports; Boston and Springfield market reports 6:00 P. M.—Dinner concert by WBZ Quintette. 7:00 P. M.—"When the Haystack Turned Bottom Up," a dramatized story prepared by the Youth's Companion. 7:30 P. M.—Bedtime story for the kiddies. Current Book Review by R. A. MacDonald. Bedtime story for grownups by Orison S. Marden. 9:55 P. M.—Arlington time signals. 11:00 P. M. Program of chamber music by the WBZ Quintette, and Helen Mosher, soprano.

Feb. 2.—11:55 A. M.—Arlington time signals; weather reports; Boston market reports. 7:00 P. M.—Dinner concert by the Hotel Kimball Trio from the Hotel Kimball dining room. 7:30 P. M. Bedtime story for the kiddies. "Bringing the World to America." prepared by "Our World Magazine." 800 P. M.—Concert by Hazel R. Kimball, soprano; George C. Vieh, pianist. 9:00 P. M.—Bedtime story for grownups by Orison S. Marden. 9:55 P. M.—Arlington time signals.

Station WJY, New York City

405 Meters (740 Kcys.) E. S. T. Feb. 1—7:30 P. M.—Frank Shevitt, "Income Taxes." 8:00 P. M.—The Honorable Julius Berg, "The Work of the New York Assembly." 8:15 P. M.—Recital by Rebecca Beam, contralto, accompanied by Creighton Allen. 9:00 P. M.—Law Enforcement Dinner under the auspices of the Citizens' Committee of One Thousand, direct from the Waldorf-Astoria; speehes by Warren Stone, Chairman of the Brotherhood of Locomotive Engineers, "Labor Relation to the 18th Amendment"; Dr. Harry Emerson Fosdick, and United States Senator Carter Glass. 10:30 P. M.—Popular program by Breau and Tobias.

Feb. 2—2:30 P. M. to 5:00 P. M. 8:30 P. M. to 10:30 P. M.

Station WSAI, Cincinnati, O.

309 Meters (970 Kcys.). C. S. T. Regular Schedule.—Tuesdays and Thursdays 8 P. M., Saturdays 10 P. M.

Station WJZ, New York City

455 Meters (660 Kcys). E. S. T. Feb. 1—12:15 A. M.—Noon Hour of Music from the Brick Presbyterian Church. 3:00 P. M.—Organ Recital by Leo Riggs on the Hotel Astor Organ. 4:00 P. M.—Recital by May Schleicher, soprano. 5:00 P. M.—"The Larger Aspect of World Affairs," by the International Interpreter. 5:30 P. M.—Closing reports of the New York State Dept. of Farms and Markets; Farm and Home reports; closing quotations of the New York Stock Exchange; foreign exchange quotations; "The Condition of the Leading Businesses," by the Magazine of Wall Street; Evening Post News. 7:00 P. M.—Woodfolk Story by Thornton Burgess. 7:30 P. M.—Burr McIntosh, the Cheerful Philosopher. 7:40 P. M.—Fred Ruzicka, violinist. 8:05 P. M.—Looseleaf Current Topics. 8:20 P. M.—Fred Ruzicka, violinist. 8:30 P. M.—Duets by Vivian Burnett, tenor, and Mrs. Burnett, soprano. 9:30 P. M.—Dr. Margaret E. Noonan. "The Place of Toys in Education"; a New York University Radio Extension Course Lecture. 9:15 P. M.—Band of Hoboken Lodge, No. 74, B. P. O. E.; James Knox, director. 10:30 P. M.—Dance program by Paul Specht and his Alamac Hotel Orchestra, direct from the Congo Room of the Alamac Hotel.

Feb. 2—3:00 P. M.—Dance program by Jasper's Orchestra. 3:30 P. M.—Mildred Kazel, soprano. 4:00 P. M.—Tea concert by the Hotel Belmont Stringed Ensemble, Harry Lerner, leader; direct from the Balcony of the Tea Room of the Hotel Belmont. 5:00 P. M.—Mrs. Ruth Beard Addis, soprano, and Mrs. Marion Callan, soprano. 5:30 P. M.—Closing reports of the New York State Dept. of Farms and Markets; Farm and Home reports; closing quotations of the New York Stock Exchange; foreign exchange quotations; Bradstreet's financial report; Evening Post News. 7:00 P. M.—"Uncle Wiggily Stories," by Howard Garis. 8:00 P. M.—Anna Sheffield, soprano. 8:15 P. M.—Piano Recital by Miss Helen Fogel. 8:40 P. M.—Dr. Alfred N. Goldsmith, Director of Research of the Radio Corporation of America: "Tapping the Ether"; one of the "Highlights of Modern Radio Broadcasting" series of talks. 9:55 P. M.—Time signals and weather forecast retransmitted from government station NAA. 10:30 P. M.—Harold Stern and his Hotel Majestic Orchestra, direct from the Hotel Majestic.

Station WFAA, Dallas, Texas

476 Meters (630 Kcys.). C. S. T. Feb. 1.—12:30-1:00 P. M.—Address, Dr. Robert Stewart Hyer, Southern Methodist University, on the Sunday school lesson, "What Israel Learned at Sinai." 8:30-9:30 P. M.—Annual dance of employees of A. Harris & Co., Jack Gardner's Orchestra playing, broadcast from the Jefferson Hotel.

Feb. 2—12:30-1:00 P. M.—Address, Dr. E. D. Shurter, general manager Good Citizenship League. 8:30-9:30 P. M.—Baylor University Founder's Day program, commemorating the seventy-ninth anniversary, broadcast from the Jefferson Hotel, Dallas. 11:00-12:00 P. M.—Musical recital by E. W. Pfaffenberger.

Feb. 3.—6:00-7:00 P. M.—Radio Bible class, Dr. William M. Anderson, Jr., pastor First Presbyterian Church, teacher. Half hour Bible study and half hour of Gospel song. 9:30-10:00 P. M.—Rev. Glenn L. Sneed, Trinity Presbyterian Church, brief address on "Prophecy and Christianity." 10:00-11:00 P. M.—Musical recital by Jack A. Davis.

Station WLW, Cincinnati, Ohio

309 Meters (870 Kcys). C. S. T. Feb. 1—10:30 A. M.—Weather forecast and business reports. 1:30 P. M.—Market reports. 3:00 P. M.—Stock quotations. 4:00 P. M.—Half hour lecture recital.

Feb. 2—10:30 A. M.—Weather forecast and business reports. 1:30 P. M.—Business reports.

Feb. 3—9:30 A. M.—Sunday school conducted by the Editorial Staff of Sunday School Publications of the Methodist Book Concern. 11:00 A. M.—Services of the Church of the Covenant, Dr. Frank Stevenson, Minister. 7:45 P. M.—Services of the Church of the Covenant, Dr. Frank Stevenson, minister.

Feb. 4—10:30 A. M.—Weather forecast and business reports. 1:30 P. M.—Business reports. 3:00 P. M.—Market reports. 4:00 P. M.—Babson reports. 8:00 P. M.—Program by the Walnut Hills Congregational Church Choir. 9:00 P. M.—Crosley Theatrical Review, followed by Roger Hill and his orchestra.

Station WGY, Schenectady, N. Y.

380 Meters (790 Kcys). E. S. T. Feb. 1—11:55 A. M.—Time signals. 12:30 P. M.—Stock market report. 12:40 P. M.—Produce market report. 12:45 P. M.—Weather forecast. 2:00 P. M.—Music and fashion talk, "What Fashion Decrees in Sport Wear," Paul A. Brown. 6:00 P. M.—Produce and stock market quotations; news bulletins. 6:30 P. M.—Children's program. 7:35 P. M.—Health talk, N. Y. State Department of Health. 7:45 P. M.—Nevin program. Address, "The Mellon Tax Plan." Judge McKenzie Moss, Assistant Secretary of the Treasury. 10:30 P. M.—A request program, "The Bo'sn's Bride," a nautical yarn, W. Rhys, Herbert, WGY Light Opera Company.

Feb. 2—11:55 A. M.—U. S. Naval Observatory time signals. 12:30 P. M.—Stock market report. 12:40 P. M.—Produce market report. 9:30 P. M.—Dance music by Jack Symonds' Orchestra, Hampton Hotel, Albany, N. Y.

Station KYW, Chicago, Ill.

536 Meters (560 Kcys.). C. S. T. Feb. 1.—9:30 A. M.—Late news and comment of the financial and commercial markets. (This service is broadcast every half hour during the twenty-four.) 11:35 A. M.—Table talk by Mrs. Anna J. Peterson. 12:30 P. M.—"The Progress of the World" by Review of Reviews. 6:30 P. M.—News, financial and final market and sport summary. 6:50 P. M.—Children's bedtime story. 10:00-2:00 A. M.—Midnight Revue. Clyde Doerr's Orchestra, also DeBabary's Orchestra from the Congress Hotel will entertain from 11 to 11:10. 12-12:30 A. M.—Remington Welch, organist at McVicker's Theatre, will render some favorite selections.

Feb. 2.—9:30 A. M.—Late news and comment of the financial and commercial markets. (This service is broadcast every half hour during the twenty-four.) 10:30 A. M.—Farm and home service. 11:35 A. M.—Table talk by Mrs. Anna J. Peterson. 6:30 P. M.—News, financial and final market and sport summary. 6:50 P. M.—Children's bedtime story. 7:00-7:30 P. M.—Dinner concert furnished by Clyde Doerr's Orchestra and Joska DeBabary's Orchestra from the Congress Hotel. 8:00-8:58 P. M.—Musical program. 9:05 P. M.—"Under the Evening Lamp," including stories, articles and humorous sketches. 10:00-2:00 A. M.—Midnight Revue from KYW studio in Congress Hotel.

Feb. 3.—11:00 A. M.—Central Church service broadcast from Orchestra Hall, Chicago. D. F. F. Shannon, pastor. 6:30 P. M.—Excerpts from the New Testament—an American translation by Prof. E. J. Goodspeed, read by William Ziegler Nourse. 7:00 P. M.—Chicago Sunday Evening Club service broadcast from Orchestra Hall. Speaker, Dr. Arthur T. Holmes.

Station WOR, Newark, N. J.

405 Meters (740 Kcys). E. S. T. Feb. 1—2:30 P. M.—Contralto solos by Mrs. Harry Jacoby. 2:45 P. M.—Sophia Kornicoff, pianist. 3:00-3:30 P. M.—Ida Benfey Judd in "Literature Across the Footlights." 3:30 P. M.—Solos by Mrs. Harry Jacoby. 6:15 P. M.—Arthur Fischer, one-string violin. 6:30-7:00 P. M.—"Man in the Moon Stories for the Children," 7:00 P. M.—The International Quartet.

Feb. 2—2:30-3:10 P. M.—"Half Hour in Norway," Norwegian Songs by Hedwig Dahl Mason. Talk on "Norway" by Wirt W. Barnitz. 3:10 P. M.—Mrs. Jane Ogle on "Wanted—a Nation Physically Fit." 3:30 P. M.—Sadye M. Gann, pianist. 6:15 P. M.—"Music While You Dine," by the Zimbler Trio of New York. 7:15 P. M.—Fred J. Bendel, Sporting Editor, Newark Morning Ledger, on "Sporting News Up-to-the-Minute." 8:00-9:00 P. M.—Gene Ingraham's Hotel Berwick Club Orchestra. 9:00 P. M.—Joint recital by Anna Hamlin, soprano, and Imogen Peay, pianist. 9:20 P. M.—Dr. Robert McElroy, Princeton University, on "Americanization." 9:40 P. M.—Adelman Twins, recital for two pianos. 9:50 P. M.—Reading horoscopes by Belle Bart, astrologist. 10:00 P. M.—Two piano recitals by Frances and Elizabeth Adelman. 10:10 P. M.—Recital by Anna Hamlin, soprano, and Imogen Peay, pianist. 10:30 P. M.—Reading horoscopes by Belle Bart. 10:40 P. M.—Adelman Twins, recital for two pianos.

Station KHJ, Los Angeles, Calif.

395 Meters (760 Kcys.) P. T. Feb. 1.—12:30-1:15 P. M.—Program through courtesy of Barker Brothers. 2:30-3:30 P. M.—Matinee musicale presented through courtesy of Barker Brothers. 6:25 P. M.—Live stock and vegetable reports. 6:30-7:00 P. M.—Richard Headrick, screen juvenile. 7:00-7:30 P. M.—Organ recital from First Methodist Episcopal Church, Arthur Blakeley, organist. 8:00-10:00 P. M.—Vera Leavitt Owen, soprano, assisted by George Campbell, cello, and Beverly Bayne and Francis Bushman, actors. 10:00-12:00 P. M.—Broadcasting Art Hickman's Orchestra, by line telephony, from the Los Angeles Biltmore Hotel.

Feb. 2—12:30-1:15 P. M.—News items. Music. 2:30-3:30 P. M.—Matinee musicale. 6:40 P. M.—Live stock and vegetable reports. 6:45-7:30 P. M.—Children's program. 8:00-10:00 P. M.—Tilda Rohr, contralto; Gertrude Ehrlich, pianist composer; Isabel Nave, pianist; Mrs. Harold E. Lanfair, violinist; Fred M. Mitchell, "Uncle Josh." N. E. Brown, electrical engineer, will give a talk. 10:00-12:00 P. M.—Broadcasting Art Hickman's Orchestra, by line telephony, from the Los Angeles Biltmore Hotel.

Station KPO, San Francisco, Calif.

423 Meters (770 Kcys.) P. T. Feb. 2.—8:00-12:00 P. M.—Art Weidner and Fairmont Hotel Dance Orchestra. During intermissions the KPO Trio will sing.

Feb. 3.—11:00-12:00 Noon—Radio church services under direction of American Bible Society. These services are undenominational and non-sectarian. 8:30-10:00 P. M.—Rudy Seiger and his orchestra in lobby of Fairmont Hotel, broadcast by remote control.

Feb. 4.—5:30-6:00 P. M.—Children's Half-hour; stories for children, taken from the Book of Knowledge. 8:00-9:00 P. M.—Organ recital by G. Herold Montague Schulteis. 9:00-10:00 P. M.—Attractive program by talented artists. Talk on the Community Chest by Milton H. Esberg. 10:00-11:00 P. M.—E. Max Bradfield's band in the Rose Room Bowl of the Palace Hotel.

Station WHAS, Louisville, Ky.

400 Meters (750 Kcys.) C. S. T. Feb. 1.—4-5 P. M. —Theatre orchestra. Police bulletins. Weather forecasts. "Just Among Home Folks," a daily column appearing in The Courier-Journal. Piano solos: Maxwell Kerr. Selections by the Walnut Theatre orchestra. Late important news bulletins. 4:50 P. M.—Local livestock, produce and grain market reports. 5:00 P. M.—Official Central Standard time announced. 7:30-9 P. M.—One-hour concert by the Louisville Syncopators. Selections by Barney Rapp and his orchestra of the Brown Hotel. Contralto solos: Miss Caroline Gauld. Late important news bulletins. Official Central Standard time announced at 9 o'cock.

Feb. 2.—4-5 P. M.—Selections by the Walnut Theatre orchestra. Police bulletins. Weather forecast. "Just Among Home Folks," a daily column appearing in The Courier-Journal. Selections by the Strand Theatre orchestra. Selections played on the Alamo Theatre organ. Late important news bulletins. 4:50 P. M.—Local livestock, produce and grain market reports. 5:00 P. M.—Official Central Standard time announced. 7:30-9 P. M.—Soprano solos: Miss Hazel McClellan. Guitar and mandolin duets; Billy Hinkle and Jean Kohlhepp. Saxophone solos: Alvin L. Marcus. Readings: Miss Mary Frances Goden. Late important news bulletins. Official Central Standard time announced at 9 o'clock.

Station WRC, Washington, D. C.

469 Meters (640 Kcys). E. S. T. Feb. 1.—5:15 P. M.—Instruction in Itnernational Code. 6:00 P. M. —Children's Hour by Peggy Albion. 6:15 P. M.— "The Question Box" by arrangement with The Pathfinder Publishing Company. 8:00 P. M.—A Bible Talk by Homer J. Councilor, Chairman of the Men's Organized Bible Class Association. 8:15 P. M.—Song Recital by Rev. G. E. Leski, baritone. 8:30 P. M.—A Talk on the Coast Guard, by Oliver M. Maxon, Chief of the Division of Operations of the United States Coast Guard. 8:45 P. M.—Song Recital by Nina Piozet, soprano. 9:00 P. M.—Joint Recital by Eugenia Botkin, first violin; Princess Macomee, second violin, and Alice Patricia Gleason, pianist. 9:20 P. M.—Concert by Pearl Hargitt's Musicians. 9:55 P. M.—Re-transmission of Time Signals and Weather Reports.

Feb. 2.—5:15 P. M.—Instruction in International Code. 6:00 P. M.—Children's Hour, by Peggy Albion. 8:00 P. M.—"When Radio Controls Radio," by Dr. Alfred N. Goldsmith, Director of Research of the Radio Corporation of America. 8:15 P. M.— Piano Recital by Henrietta Heinrich. 8:30 P. M.— Song Recital by Elizabeth Dayton, soprano. 8:45 P. M.—Song Recital by John Kenwood, baritone. 9:00 P. M.—A Talk on Immigration by Hon. James J. Davis, Secretary of Labor. 9:15 P. M.—Song Recital by Elizabeth Dayton, soprano. 9:30 P. M.— Rosey's Washington Five. 9:55 P. M.—Re-transmission of Time Signals and Weather Reports.

Station WDAR, Philadelphia, Pa.

395 Meters (760 Kcys). E. S. T. Feb. 1—11:45— Daily Almanac. 12:02.—Organ Recital from the Stanley Theatre; Features from the studio; Arcadia Concert Orchestra. 2:00-3:00 P. M.—Arcadia Concert Orchestra—Artist Recital from the studio. 4:30 P. M.—Program of Dance Music. 7:30 P. M.— Dream Daddy with the Boys and Girls. 7:50 P. M. —Poets and Authors Corner. 8:00 P. M.—Book Review. Recital under direction of Mrs. B. F. Masschal Challiss', banjoist; Wm. J. Morris, tenor; Jose de Sandosequi, pianist. Playlet by the Walter Greenough players. 10:10 P. M.—Howard Lanin's Dance Orchestra from the Arcadia Cafe. Special features from the leading playhouses in Philadelphia will entertain during the intermission of the orchestra.

Feb. 2.—11:45 A. M.—Daily Almanac. 12:02 Noon —Organ Recital from the Stanley Theatre; Features from the studio; Arcadia Concert Orchestra. 2:00-3:00 P. M.—Arcadia Concert Orchestra—Artist Recital from the studio. 4:30 P. M.—Bobbie Lee and his Cotton Pickers. 7:30 P. M.—Dream Daddy with the Boys and Girls.

Station WHAZ, Troy, N. Y.

30 Meters (790 Kcys.) E. S. T. Feb. 4.—9:00 P. M.—Minstrel Show under auspices of Troy Council, United Commercial Travelers of America. Popular dance music by Art Thompson's orchestra.

Feb. 11.—9:00 P. M.—Scotch concert by Troy Burns Club. Address by representative of New York State Conservation Commission. Midnight program by the Campus Serenaders and Rensselaer Polytechnic Institute Students' Glee Club.

Feb. 18.—9:00 P. M.—Program by members of Troy Chapter, Order of de Molay. Arthur C. Parker, New York State Archeologist, on "Aboriginal Methods of Communication," with interpretation of native Indian music by Robert Kerr Colville. Special Far East program by Oriental students at the Renssalaer Polytechnic Institute from China, Japan, Siam, India and the Philippines.

Feb. 25.—9:00 P. M.—Renssalear Polytechnic Institute Students' Night, with program by Students' Symphony Orchestra. Address by Dr. John M. Clarke, Director of the New York State Museum.

Station KSD, St. Louis, Mo.

546 Meters (550 Kcys). C. S. T. Feb. 2.—7:00 P. M.—Orchestra concert, organ recital, vocal and instrumental specialties broadcast direct from the Missouri Theatre.

Station WOC, Davenport, Iowa

484 Meters (620 Kcys.). C. S. T. Feb. 1.—10:00 A. M.—Opening Market Quotations and Household Hints. 10:55 A. M.—Time signals. 11:00 A. M.— Weather and river forecast. 11:05 A. M.—Market quotations. 12:00 Noon—Chimes Concert. 2:00 P. M.—Closing Stocks and Markets. 3:30 P. M. —C. A. Russell, Department of Chemistry, The P. S. C., on "Water Purification." 5:45 P. M.— Chimes Concert. 6:30 P. M.—Sandman's Visit. 6:50 P. M.—Sport news and weather forecast. 7:20 P. M.—International lesson for next Sunday discussed by Dr. Frank Willard Court, pastor St. John's Methodist Episcopal Church, Davenport, Iowa. 8:00 P. M.—Musical program—Edwin Swindell, musical director. Program given by the Jackson School Orchestra, of Muscatine, Iowa. Directed by Mrs. A. C. Springhorn.

Feb. 2.—10:00 A. M.—Opening Market Quotations and Household Hints. 10:55 A. M.—Time signals. 11:00 A. M.—Weather and river forecast. 11:05 A. M.—Market quotations. 12:00 Noon—Chimes Concert. 12:30 P. M.—Closing Stocks and Markets. 3:30 P. M.—Lecture by C. C. Hall, Department of Chemistry, The P. S. C., on "Science and the Transfusion of Blood." 5:45 P. M.— Chimes Concert. 6:30 P. M.—Sandman's Visit. 6:50 P. M.—Sport news and weather forecast. 9:00 P. M.—P. S. C. Orchestra. Gerald M. Barrow, director. (Popular selections released through the National Association of Broadcasters, of which WOC is a member.) V. B. Rochte, baritone soloist.

Station WWJ, Detroit, Mich.

517 Meters (580 Kcys.) E. S. T. Feb. 1.—9:30 A. M.—"Tonight's Dinner" and a special talk by the Woman's Editor. 9:45 A. M.—Public Health Service bulletin and talks on subjects of general interest. 10:25 A. M.—Official weather forecast. 11:55 A. M.—Arlington time relayed by the Western Union. 12:00 Noon—Dance mu ic by Jean Goldkette's Orchestra, broadcast from the Graystone Ballroom. 3:00 P. M.—The Detroit News Orchestra. 3:30 P. M.—Official weather forecast. 3:35 P. M.—Market reports. 8:30 P. M.—The Detroit News Orchestra; Anne Campbell, Detroit News Poet; C. Bruce Myers, baritone.

Feb. 2.—9:30 A. M.—"Tonight's Dinner" and a special talk by the Woman's Editor. 9:45 A. M. —Public Health Service bulletin and talks on subjects of general interest. 10:25 A. M.—Official weather forecast. 11:55 A. M.—Arlington time relayed by the Western Union. 3:00 P. M.—The Detroit News Orchestra. 3:30 P. M.—Official weather forecast. 3:35 P. M.—Market reports.

Feb. 3.—11:00 A. M.—Services of St. Paul's Episcopal Cathedral broadcast from the cathedral. 5:00 P. M.—The Detroit News Orchestra. Anton Lang, Christus of the Oberammergau Passion Players, speaker.

Station KGW, Portland, Ore.

492 Meters (610 Kcys). P. T. Feb. 1—11:30 A. M.—Weather forecast. 3:30 P. M.—Lecture by Margery Smith of Oregon Argicultural College. 7:30 P. M.—Weather forecast and market reports. 8:00 P. M.—Accordion solos by John Sylvester. 8:15 P. M.—Dance music by George Olsen's Metropolitan Orchestra of the Hotel Portland, directed by Herman Kenin. 9:00 P. M.—University of Oregon extension lectures. 10:30 P. M.—Hoot Owls with Pantages Frolic.

Feb. 2—11:30 A. M.—Weather forecast. 3:30 P. M.—Children's program. Story by Aunt Nell. 10:00 P. M.—Weather forecast and dance music by George Olsen's Metropolitan orchestra of the Hotel Portland.

Station WTAM, Cleveland, Ohio

390 Meters (770 Kcys.) E. S. T. Feb. 6.—8 P. M. W. T. A. M. Orchestra; Evelyn Siegrist, soprano; Leonard Siegel, baritone; Ben Silverberg, violin; Anna Simmermacher, contralto; Gustav Johnson, tenor; Max Schmitt, cello; Bernice Payne, soprano; Ernest H Crebbin, baritone; A. R. Hruby, trumpet.

Station WOO, Philadelphia, Pa.

509 Meters (590 Kcys.) E. S. T. Feb. 1.—11:00 A. M.—Grand Organ. 11:30 A. M.—Weather forecast. 11:55 A. M.—Naval Observatory time signal. 12:00 Noon—Luncheon music by the Tea Room Orchestra. 4:45 P. M.—Grand Organ and Trumpets. 5:00 P. M.—Sports results and police reports. 7:30 P. M.—Dinner music from Hotel Adelphia Concert Orchestra. 8:00 P. M.—Recital program. 8:30 P. M.—Special musical program direct from the Fox Theatre. 9:15 P. M.—Wm. Baranhardt on "Criminal Psychology." 9:30 P. M. —Grand Organ recital, Miss Mary E. Vogt at the Console. 9:55 P. M.—Naval Observatory time signal. 10:02 P. M.—Weather forecast. 10:10 P. M.— Dance music from Hotel Adelphia.

Feb. 2.—11:00 A. M.—Grand Organ. 11:30 A. M. —Weather forecast. 11:55 A. M.—Naval Observatory time signal. 12:00 Noon—Luncheon music by the Tea Room Orchestra. 4:45 P. M.—Grand Organ and Trumpets. 5:00 P. M.—Sports results and police reports. 9:55 P. M.—Naval Observatory time signal. 10:02 P. M.—Weather forecast.

Station WSB, Atlanta, Ga.

429 Meters (700 Kcys.) C. S. T. Feb. 1.—5:00 P. M.—Twilight concert by Vick Myers Melody Orchestra; news and markets. 5:30 P. M.— Kiddie program and Burgess bedtime story by Miss Bonnie Bardhardt. 8:00-9:00 P. M.—Entertainment by the Foot-Warmers Dance Orchestra. 10:45 P. M.—Transcontinental Radiowl entertainment, presenting Miss Evelyn Cowan, pianist, and other artists.

Feb. 2.—5:00 P. M.—Young violin students of Miss Mary Douglas; news, and markets, and message on "Foreign Trade and Commerce," by B. C. Getsinger. 5:30 P. M.—Kiddie program and Burgess bedtime story by Miss Bonnie Bardhardt. 8:00-9:00 P. M.—Entertainment by the Christian Endeavor Societies of the city. 10:45 P. M.— Transcontinental Radiowl entertainment.

Station KFAE, Pullman, Wash.

330 Meters (910 Kcys.) P. T. Feb. 1—Musical reading, Miss Mabel Carstens. "Barley," Dr. E. F. Gaines. Botany talk, Dr. F. L. Jickett. Violin Solos, Jaroslav Sotola. Instrumental numbers. Vocal numbers. New books, Miss Alice L. Webb.

Feb. 4.—Reading, Miss Estelle Ericson. Band numbers. Agricultural talk, Prof. C. L. Vincent. Mezzo-soprano song group, by Miss Mildred Smalling. Irmingarde King, Spokane, pianist. Educational lecture.

Feb. 6.—"The Cost of Style," by Miss Edna Irene Avery. Orchestral numbers. Vocal selections. "Hot-Beds and Their Possibilities," Prof. C. L. Vincent. Instrumental music.

Feb. 8.—"Metals and Crystals," Prof. Hugh M. Henton. "Soils," Prof. Vincent. Instrumental numbers. New Things to Read, Miss Alice L. Webb. Vocal solos. Instrumental music.

Station KFI, Los Angeles, Calif.

469 Meters (630 Kcys.) P. T. Feb. 10.—10:00-10:45 A. M.—L. A. Church Federation Service. 4:00-5:00 P. M.—Federated Church Musicians Vesper Service. 6:45-7:30 P. M.—Bedtime story and concert. 8:00-9:00 P. M.—Ambassador Hotel concert. 9:00-10:00 P. M.—Examiner concert. 10:00-11:00 P. M.— Theron Bennett's Packard Six.

Feb. 11.—4:45 to 5:15 P. M.—Evening Herald News Bulletin. 5:15-5:45 P. M.—Examiner News Bulletins. 8:00-9:00 P. M.—Examiner concert. 10.00-11:00 P. M.—Ambassador-Lyman's Cocoanut Grove Orchestra.

Station WBAP, Fort Worth, Texas

476 Meters (620 Kcys.) C. S. T. Feb. 3.—11:00-12:00 P. M.—Complete services of the First Methodist Church; Rev. J. W. Bergin, pastor; Will Foster, organist. 4:00-5:00 P. M.—Organ concert. 5:00-6:00 P. M.—Vesper concert. 11:00-12:00 P. M. Concert.

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Latest Radio Patents

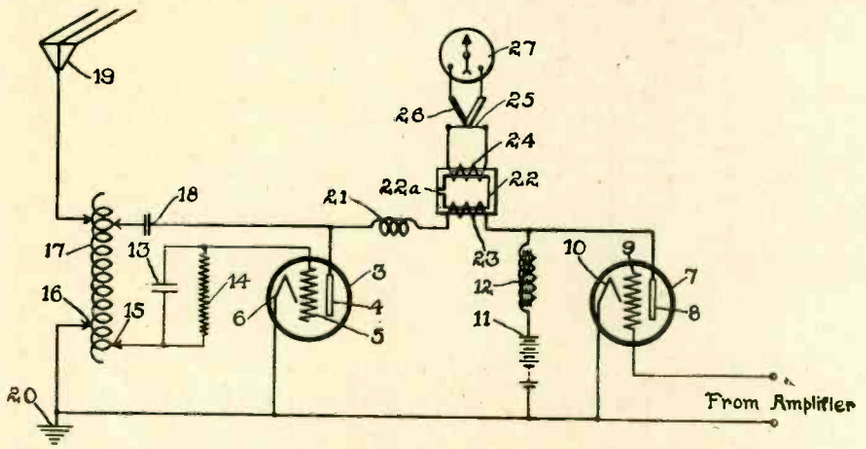
Radio Modulation System

No. 1,477,316: Patented December 11, 1923. Patentee: Frank Conrad, Pittsburgh, Pa.

My invention relates to radio telephone transmission and it has particular relation to means for measuring the modulation and to methods of and apparatus for controlling the modulation.

One object of my invention is to provide a meter registering the alternating current component of the modulated current supplied to an oscillator tube, said meter being calibrated to indicate directly the ratio of the effective alternating current component to 7 times the steady direct component.

A further object of my invention is to provide a mechanism and a method of operation wherein the intensity of the modulation is controlled in accordance with a chart showing various average effective values of the modulating current or, in general, of the modulation envelope. Such values are worked out with respect to the different kinds of sound being transmitted in such manner that the loudest individual units of the sound shall not, in general, cause the instantaneous intensity of modulation to materially exceed the value at which distortion from over-modulation begins, as more fully described hereinafter.



Method and means for controlling the modulation of a phone transmitter.

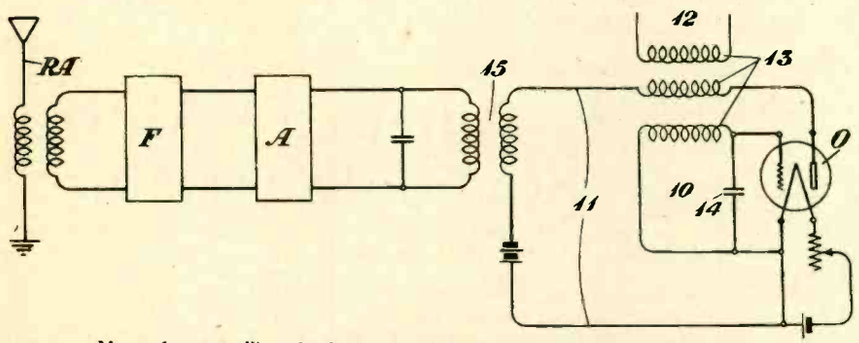
Frequency-Control System

No. 1,476,721: Patented December 11, 1923. Patentee: DeL. K. Martin, Orange, N. J.

This invention relates to signalling by means of carrier frequencies and more particularly to an arrangement for controlling the carrier frequency used for signalling by different stations.

In a system, either wire or radio, employing carrier currents for transmission purposes, it is frequently desirable that some method be available for controlling the carrier frequency at one station from a distant station. In a wire carrier system, for example, it is necessary, where the homodyne method of receiving is employed to properly synchronize the frequencies used for receiving with the frequencies used for transmitting at the distant station, and it is also desirable that the spacing of the carrier frequencies employed by the various channels be maintained in the same relation. In a radio system the same situation arises, and in addition it is desirable that the frequencies assigned to different stations and to groups of stations belonging to different systems be maintained in proper spacial relation. This is necessary in the one case to prevent interference between different signaling stations of the same system and in the other case to prevent interference between stations of different systems.

All of these situations call for some arrangements whereby a frequency at one station may be controlled from a distant station. In accordance with the present invention it is proposed to accomplish this result by arranging the circuits of a vacuum tube oscillator, so that the particular frequency at which the vacuum tube will oscillate will correspond either to the master frequency or to a frequency derived therefrom.



Means for controlling the frequency of a transmitter, either local or distant.

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Just One Month Old!

From F. Kummer, 296 Claremont Avenue, Jersey City, N. J.

I have been a constant reader of your excellent magazine and have taken great interest in the records the fans send in. I am located in the heart of broadcasting and have some of the most powerful stations operating to tune out such as WEAF, WJZ, WOR, WJY and WHN. My set is just one month old and I have never worked it after midnight. All these stations have been heard with local stations broadcasting: WEAF, WJZ, WBAY, WJY, WHN, WQAD, WLAW and WDT, New York City broadcasters; WOR, WAAM and WBS, Newark, N. J.; WDAR, WFI, WOO, WIP, Philadelphia, Pa.; WGY, Schenectady, N. Y.; WCAD, Canton, N. Y.; WHAZ, Troy, N. Y.; WGR, Troy, N. Y.; WRC, Washington, D. C.; WBZ, Springfield, Mass.; WNAC, Boston, Mass.; WSAD and WJAR, Providence, R. I.; KDKA and WCAE, Pittsburgh, Pa.; WTAM and WJAX, Cleveland, O.; WHAS, Louisville, Ky.; WSAI and WLW, Cincinnati, O.; KOP, Detroit, Mich.; WDAP, WJAZ and KYW, Chicago, Ill.; WCBD, Zion, Ill.; WTAS, Elgin, Ill.; WOC, Davenport, Iowa; WDAX, Centerville, Iowa; WAAN, Columbia, Mo.; WOS, Jefferson City, Mo.; WSB, Atlanta, Ga.; WDAF, Kansas City, Mo.; WFAA, Dallas, Tex., and WOAW, Omaha, Neb.

On One Radio, Detector and One Audio

From Kenneth Goodsell, 107 Gem Avenue, Bridgeport, Conn.

Being a regular reader of your fine weekly radio magazine I am an ardent radio fan; being a radiophan I take great pleasure in finding new stations.

Below I am giving a list of stations I have received in the last three months. Every station in this list I have heard more than once and I always wait to hear the announcement of the call letters three times from every station before logging them.

My total to date is 62 stations. Largest total for one night 22 stations, including WKAQ, Porto Rico and WHB, Kansas City with a Federal No. 110.

Porto Rico, San Juan, WKAQ; Cuba, Tuinucu, 6KW; Havana, PWX; Omaha, Neb., WOAW; Davenport, Ia., WOC; Jefferson City, Mo., WOS; Kansas City, Mo., WHB, WDAF; St. Louis, Mo., KSD; Memphis, Tenn., WMC; Waupaca, Wis., WPAH; Zion, Ill., WCBD; Elgin, Ill., WTAS; Chicago, Ill., WDAP, WMAQ, KYW, WJAZ; Louisville, Ky., WHAS; Cincinnati, O., WLW, WSAI; Detroit, Mich., WWJ, KOP, WCX; Atlanta, Ga., WSB; Pittsburgh, Pa., KDKA, WHAF, WCAE, KVQ, WJAS; Harrisburg, WBAK; Blacksbug, Va., WEAE; Cleveland, O., WTAM, WJAX; Buffalo, N. Y., WGR; Lockport, N. Y., WMAK; Rochester, N. Y., WHAM; Schenectady, WGY; Troy, WHAZ; Springfield, WBZ; Boston, Mass., WNAC; Providence, WJAR, WSAD, WEAN; Medford, Mass., WGI; Canada, Montreal, CKAC, CHYC; New York City, WEAF, WBAY, WJZ, WJY, WHN; Newark, N. J., WAAM, WOR; Philadelphia, WDAR, WFI, WOO, WIP; Washington, D. C., WRC, WCAP; Cleveland, O., WHK; Ames, Iowa, WOI.

Here to There—and Back Again

From E. L. McFarland, 721 Northwestern Avenue, Ames, Iowa.

I am going to take advantage of your invitation to send in our records. Last night I heard forty-four stations not counting local ones. I have heard all but two or three of these before and made sure of their calls.

The set I use is a regenerative with two stages of audio-frequency amplification. I get most of the stations on a Magnovox loud enough to be heard in two rooms.

The following is a list of the stations I heard last night: WOAW, Omaha, Neb.; WHB, Kansas City; WOAL, Minneapolis; WDAP, Chicago; KYW, Chicago; WOS, Jefferson City, Mo.; WLAG, Minneapolis; KDKA and WCAE, Pittsburgh; WJZ, WEAF and WHN, New York; WOAI, San Antonio; WOC, Davenport; WBAP, Fort Worth; WDAF, Kansas City; KSD, St. Louis; WCAP, Washington; WMAQ, Chicago; KFLE, Denver; WPAL and WCAH, Columbus; WFAA, Dallas; WTAM, Cleveland; WHAS, Louisville; WOO, WIP and WFI, Philadelphia; KHJ and KFI, Los Angeles; WGY, Schenectady; KFDV, Fayettesville, Ark.; WMC, Memphis; WSAI, Cincinnati; WTAS Elgin; WJAZ, Chicago; PWX, Havana; WSB, Atlanta; WABT, Washington, Pa.; KFKB, Milford, Kan.; Peabody, Kan., testing; KFMX, Northfield, Minn.; KPO, San Francisco.

Is this reception up to the average? My aerial is a single strand 150 feet long including lead in and is about thirty feet high. Best 73's.

MAGNAVOX instruments are never subject to those internal interferences which, at critical moments, are so apt to mar the performance of ordinary radio reproducers.

To measure the success which Magnavox engineers have accomplished in the design and manufacture of Magnavox products, remember that they have been sold in far larger quantities than any other radio units in the world.

Magnavox Reproducers

R2 with 18-inch curvex horn $60.00
R3 with 14-inch curvex horn $35.00
M1 with 14-inch curvex horn. Requires no battery for the field. $35.00

Magnavox Combination Sets

A1-R consisting of electro-dynamic Reproducer with 14-inch curvex horn and 1 stage of amplification $59.00
A2-R consisting of electro-dynamic Reproducer with 14-inch curvex horn and 2 stages of amplification $85.00

Magnavox Power Amplifiers

A1—1-stage $27.50
AC-2-C—2-stage $55.00
AC-3-C—3-stage $75.00

Magnavox Products are for sale at Registered Magnavox Dealers everywhere. Write for new 32-page Magnavox Radio Catalogue.

THE MAGNAVOX CO., Oakland, Calif.
New York Office: 370 Seventh Avenue
2R Perkins Electric Limited, Toronto, Montreal, Winnipeg, *Canadian Distributors*

For every receiving set there is a MAGNAVOX

Radio Merchandising

Advertising Rates: Display, $5.00 an inch, $150.00 a page. Classified Quick-Action Advertising, 5 cents a word. Phones: Lackawanna 6976 and 2063

Merger of Crosley Radio Interests

POWEL CROSLEY, JR., announced last week the merger into the Crosley Radio Corporation, Cincinnati, Ohio, of the Crosley Manufacturing Company and the Precision Equipment Company, both of which Mr. Crosley has served as president for some time past. Through the acquisition of a larger manufacturing plant the new company will have a capacity of 5,000 receiving sets per day, which is claimed to be the largest output of any radio organization in the world.

Under the merger many economies will be effected in production, administration, management, advertising, and in other ways. The same policies will be effective as heretofore, with the same personnel in charge.

The Crosley Radio Corporation now occupies three large plants in Cincinnati, including its own woodworking cabinet plant. A fourth plant larger than the present three combined has just been purchased for additional expansion.

Vacuum Tube Burn-Out Insurance

THE subject of vacuum tube protection from accidental burn-outs has been given much attention by the engineers of the Radio Equipment Co., 20 Stuart St., Boston, who spent over a year of research work on the problem. The results of these efforts are several types of quick flash fuses developed to fit the particular needs of every class of vacuum tube now on the amateur market. Owing to the fact some tubes burn out when only a slight excess of voltage is applied to the filament made it highly inefficient to use one style of fuse for all tubes. Besides the fact that the Radeco safety fuse is a well developed laboratory product it is unique in design. It is only necessary to slip the fuse over one of the filament lead legs of the tube and without further connection the tube is protected. It is not necessary to use a fuse block or otherwise mount the fuse remote from the tube. The two are inseparably bound together as long as desired, yet the fuse can be instantly removed and placed on another tube. The use of Radeco safety fuses constitutes a vacuum tube burn-out insurance policy.

Radio Trade Notes

The Sterling-Miles Radio Station, 288 Judson street, Pontiac, Mich., would like to get in touch with a jobber who will sell them wholesale on a consignment basis.

* * *

H. Newcome, of the Arrow Battery Service, 6 Eightieth street, Woodhaven, N. Y., states that he intends to travel and act as a distributor for radio sets and parts. He would like to hear from interested manufacturers.

* * *

Otto A. Halquist, 10 Pratt street, Nashua, N. H., informs RADIO WORLD that, in his opinion, there is an excellent opportunity in Nashua for an up-to-date radio store.

* * *

Radio Supply House, Perry Young, manager, 258 South Main street, Columbus, Ohio, has just entered the radio business as a distributor.

* * *

Jones Motor Mart, 37-39 Mill Street, Newport, R. I., is in the market for radio goods of all kinds.

A Broadcasting Station in the Movies

"HOLLYWOOD" McCOSKER, whose weekly talks on current motion pictures have proven one of the most popular features of Station WOR, Newark, N. J., at the conclusion of his reviews of recent photoplays, will tell the radio audience all about a picture he recently directed, the title of which is "Behind the Scenes at WOR." This news reel release produced by International will present to thousands of radio fans the intimate story of the WOR studio and will feature several of the artists who regularly appear at WOR. The star of the tabloid feature is "Chief," Jolly Bill Steinke's ethereal hound.

"The Man in the Moon," portrayed by the creator, William F. B. McNeary, Louise Egner, hostess at WOR and studio accompanist, Jimmy Shearer, vaudeville artist and revue king, are among those who appeared in the movie of WOR.

A dramatic and even tragic effect will close the picture showing "J. M. B." and Jack Poppele of WOR signaling the crew of the "Shenandoah" precisely as the scene was enacted on the memorable night when Messrs. Barnett and Poppele communicated with the aircraft.

Radio Literature Wanted

Manufacturers of and dealers in radio apparatus and accessories are notified that literature and catalogues describing their products have been requested, through the Service Editor of RADIO WORLD, by the following:

Sterling-Miles Radio Station, 288 Judson St., Pontiac, Mich.
C. W. Smith, P. O. Box 74, Oroville, Wash. (Makes and installs sets).
A. S. Pospisil, Bruno, Neb.
L. L. Matt Lews, Sr., Box 331, Imperial, Pa.
Thos. J. Rosum, Humboldt, S. D.
Frank Baertich, Troy, Ind. (Sells sets.)
Radio Supply House, 258 S. Main St., Columbus, Ohio. (Distributor.)
Edward Howard, U. S. N., Ward "A," Naval Hospital, Great Lakes, Ill.
R. R. McGee, 1202 Pine St., Rolla, Mo.
Joseph Jackson, 5 Naguet street, N. S. Pittsburgh, Observatory Station, Pa.

Edison Says Broadcasting Will Increase Phonograph Record Demand

THOMAS A. EDISON recently was interviewed by a representative of "The Talking Machine World" on topics of interest to the phonograph trade. During the interview Mr. Edison said:

"Every farmer ultimately will own a radio of a reasonably priced sort and most of the well-to-do people will buy high-priced outfits.

"There already is considerable evidence that the broadcasting of music over radio has increased the demand for certain records and it seems quite probable that this broadcasting will, in the long run, develop a tendency for people to create libraries of the great instrumental music and the fine songs of the world, in which collections they will take as much pride as in their libraries of reading literature."

Radio and Electrical Business Opportunities

Rate: 40c a line. Minimum. 3 lines.

LET US BE YOUR FACTORY

Don't put your capital into machinery. We have excellent equipment, skilled mechanics and wide experience in building dies, tools and economical manufacturing of small devices; we do not finance inventions, but if you have funds to produce your article you can employ our facilities profitably and with less risk; at a reasonable charge we will design and build your tools, make your parts, and, if desired, assemble, pack and ship the complete device; our responsibility is established. Interstate Mechanical Laboratories, 521 West 57th St., New York City. Phone Columbus 5321.

RADIO DEPARTMENT TO LET in one of the most prominent toy and sporting goods shops in Queens; wonderful opportunity for right party. Inquire at Greenfield, 299 Steinway Ave., Astoria, L. I., N. Y. Phone Astoria 0610.

INTEREST IN MACHINERY BUSINESS wanted, electrical or otherwise; must be on paying basis and subject to expert examination; am 30, with 6 years' electrical experience; would invest $10,000; Jersey preferred. P. O. Box 158, South Orange, N. J.

Dealers, Here's An Idea for You!

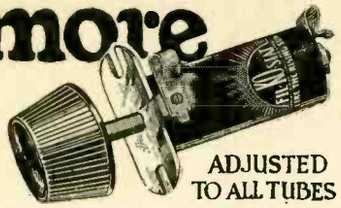
UP to the present time, the buyers of radio sets have all been of the type that go to the radio stores of their own volition, see the sets and then purchase. This lets out the great class that, although they hear about radio and are well cognizant of the fact that radio programs are on the air day and night, never become directly interested. They form a very large class and are potential buyers.

Radio receivers are today as much a part of a home as a Victrola or a davbed or a library table. Why not, therefore, go about selling them in a manner that would encompass every one of the possible buyers—even though they are of the type above outlined?

One way to do this would be to go to the bureau of vital statistics in every large community, say the marriage bureau, for instance, get the names of the newly married couples, and sell them on the idea that when they are buying furniture and equipping their homes, to consider radio as a part of the installation and make an allowance for it.

Here is an idea of a new way that dealers in radio—the real live sort of firms—can accomplish wonders, as there is plenty of meat for their files in this suggestion.

18 times more



ADJUSTED TO ALL TUBES

FIL-KO-STAT has a fine adjustment area *many times* greater than any other rheostat. It is the only rheostat assuring minute control over the maximum audibility range of the vacuum tube; bringing in DX stations you never heard before and eliminating tube noises.

30 ohms full resistance.
No adjustment to puzzle.
No discs to break.
No Carbon Powder.

$2 AT ALL DEALERS

FIL-KO-STAT

Made and Guaranteed by
DX Instrument Co. Harrisburg, Pa.
Radio Stores Corp., 218 W. 34th St., New York
Sole International Distributors

BRISTOL AUDIOPHONE
MORE THAN A LOUD SPEAKER
Bristol Audiophone, Sr., 15-in. Horn..$32.50
Bristol Audiophone, Jr., 11-in. Horn..$22.50
Bristol Single Stage Power Amplifier..$25.00
Write for Bulletin 3006-W
The Bristol Company
Waterbury, Conn.

You Don't Like to Solder
VERY FEW FANS REALLY DO
Anyone can assemble a radio set with a screw driver and pliers by using the new perforated flat copper connector and be sure of its efficiency.
Send a quarter to
PORTER MANUFACTURING COMPANY
135 East Jefferson DETROIT, MICH.

LITZ WIRE

All Sizes

IN STOCK

I. R. NELSON CO.

Bond Street Newark, N. J.

WAAM

Write for Bulletin N 1

DOUBLE THE LIFE AT HALF THE COST

Arrow Radio Batteries

are guaranteed two years in writing.

Will ship C. O. D. or allow 5% discount for cash with order. Order shipped same day received. Write today.

We specialize in Storage Batteries only.

6 V., 60 amps. $8.50
6 V., 80 amps. 10.00
6 V., 100 amps. 12.50

Arrow Battery Co.
8 St. Clare Place
New York City

RADIO WORLD, 15c. per copy; $3.00 for six months; $6.00 per year.

HOWARD

No. 1001
6½ Ohm Rheostat $1.10
25 Ohm Rheostat 1.10
40 Ohm Rheostat 1.10
Patd. 870,042

HOWARD

No. 1003
200 Ohm Potentiometer .$1.50
400 Ohm Potentiometer. 2.00
Patd. 870,042

HOWARD

No. 1004
Multi Terminal Receiver Plug, Instantaneous connection for as many as six pairs of standard receiver tips $2.00
Patd. Aug. 28, 1923

HOWARD

No. 1002
6¾ Ohm Micrometer Rheostat ...$1.50
25 Ohm Micrometer Rheostat ... 1.50
40 Ohm Micrometer Rheostat ... 1.50
Patd. July 10, 1923

HOWARD

Ask the man to show you the **Howard** line of quality Radio Merchandise. Every piece is sold with the **guarantee** of **satisfactory** performance.

JOBBERS WRITE FOR DISCOUNTS

Send 2c. stamp for wiring diagram and folder to Dept. J.

BLUE SEAL Howard Radio Co. Inc. GUARANTEED PRODUCTS Chicago, U.S.A.

4248 North Western Ave.

THAT SUPERDYNE RECEIVER!

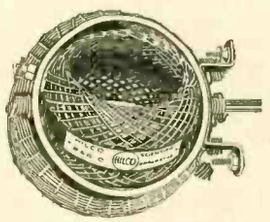
The receiver every fan has been looking for. The Four-Tube Receiver that is more powerful than a six-tube Naval Receiver. The Receiver which does not require a laboratory expert to build or operate. The Receiver that accomplishes anything any other will—and then more.

SEE RADIO WORLD

for Dec. 15, 22 and 29, and get all the details which will enable you to build this marvelous four-tube wonder. The 3 copies for 45c, or sent free if you send $6.00 for yearly subscription. NOW!

BUILD a "S-U-P-E-R-D-Y-N-E"

RADIO WORLD, 1493 Broadway, N. Y. C.



HILCO VARIOCOUPLER
Type "E"

Contains primary and secondary winding of the HILCO Lattice Banked type, and is ideal for use in single, two and three circuits; close adjustments in wave lengths of 200 to 600 meters; very selective, sharp tuning and variable thru wide range. Price $7.00.

Specified as Standard Equipment in Erla Reflex and other well-known receiving circuits.

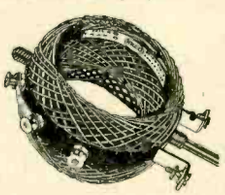
What a Difference the HILCO Variocoupler Makes!

Put a HILCO variocoupler or variometer in your set and note the difference! The dominant and exclusive features of HILCO inductance coils are—1st, lattice-bank type of winding, which suspends the wire in air with the successive turns crossing each other at right angles. (*This winding possesses much greater efficiency than honeycomb and duolateral windings, and should not be confused with them*). 2nd, The unique design of mounting the winding, with minimum amount of insulating or energy-absorbing material employed.

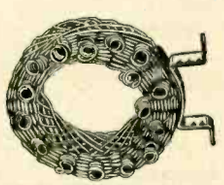
These construction features make HILCO inductance coils very selective and sharp-tuning, enabling the most distant broadcasting stations to be brought in right thru nearby stations.

HILCO Radio Products are now sold by most dealers and jobbers. If your dealer or jobber can't supply you, send his name with order and we will see you are supplied.

DEALERS AND JOBBERS: Hilco Radio Products are profitable, satisfactory merchandise, with quick turnover. Write for literature and discounts.



Type A Variometer, very selective and sharp-tuning thru a range of from 200 to 600 meters. Price $6.00.



HILCO TYPE R1 Inductance Coil for Reinartz circuit; will tune to wave lengths of 200 to 600 meters. Price $2.50.

HILCO Krystlkoil--most efficient for crystal sets; winding tapped for tuning from 200 to 600 meters. Price $1.25.

A. E. HILL MFG. CO., Atlanta, Ga., U. S. A.

SCIENTIFIC HILCO RADIO APPARATUS

Yonemura Receives Medal From R. C. A.

KAICHIRO YONEMURA, superintendent of the radio station at Tomioka, Japan, who sent out the first radio message notifying the world of the Japanese earthquake last September, has had his exploit recognized by the Radio Corporation of America in the form of a gold medal and $500. Mr. Yonemura described the circumstances under which the now historic message was sent in an exclusive article in RADIO WORLD for December 1, 1923.

Radio Recalls Airplane from Storm

AN airplane which left Paris for Switzerland recently was recalled over a wireless telephone half an hour after it started.

The airplane was taking passengers to Geneva, and when it left the Le Bourget airdrome at 9:45 o'clock the weather reports from along the route were satisfactory, says a cable dispatch to the New York "Times." Half an hour later, however, other reports reached Le Bourget to the effect that a violent wind and rain storm was beginning in the Jura Mountains and it was decided, if possible, to recall the pilot.

The distance the airplane had flown was calculated, and a wireless telephone call was given, advising the pilot to abandon the flight. The airman had the phones at his ears, picked up the message and immediately flew back to Le Bourget.

Radio Signals Heard In 1400-Foot Mine

A PRESS dispatch from Bisbee, Arizona, states that a group of electricians, radio fans and newspaper men 1,400 feet down in the Junction Mine heard wireless telegraph signals, believed to have been sent in United States navy code. Efforts to tune in on radiophone concerts were unsuccessful, although "carrier waves" were caught, leading to the opinion that with more elaborate preparation radiophone concerts could be heard in the mines. The experiment was the initial step in testing the use of radio in mine rescue work.

Roxy's Gang to Tour

THE artists who broadcast on the air from the Capitol Theatre, New York City, every week have become so popular in the outlying districts where the concerts are received that numerous requests have been received by S. L. Rothafel from radio fans and civic organizations in various cities along the Atlantic seaboard, to permit his artists to appear there in concert. Plans are now being made for several concerts by the entire company of instrumental and vocal artists in Providence and Washington within the next few weeks.

OUT OF THE ETHER

Chats About Broadcasting Stations

By Hirsch M. Kaplan

WGI presented the novelty feature for this week in Stanley H. Greenlaw and his musical saw, who entertained us with a very splendid program of popular and classical numbers. Too bad station WGI fades with such intensity, for much of Mr. Greenlaw's program was lost to us; nevertheless we heard enough to satisfy our appetite.

No doubt there are few who knew that the famous Benjamin Franklin was the greatest cross-country walker of his time, until "Ed" Hughes, famous New York sport writer and cartoonist, told us so in his short talk on "Ben Franklin as an Athlete" from station WJZ.

Do you like band music? Then tune in station WNAC or WEAN, any Tuesday evening at 8:15 and listen to one of the finest bands that has ever played over radio. This combination is called the Boston American Band.

WAAM sprang a surprise the other evening when it offered a program of dance music as played by the WAAM Orchestra and let me tell you that it sure can play. This group is on the air almost every evening, so if you want to have a good dance, or if you want to listen to a good orchestra, tune down to 263 meters and enjoy yourself to your heart's content. By the way, may we call to the attention of those operating this station, that the musical program rendered at their studio comes through great, but that voice numbers are terribly distorted? It sounds as if you are using the same microphone for both. Maybe that is your trouble.

Swinging our loop in a westerly direction the other evening, we tuned in station WDAF of the "Nighthawks" as they were presenting a number of popular selections as played by "Tim" Crawford" upon the organ. Mr. Crawford made his offerings very interesting by playing many of them in his own arrangement.

Eddie Cantor and Fannie Brice, two of Broadway's most famous comedians, did their bit toward giving the radio audience an enjoyable evening by offering several jokes put over with Jewish accent. Their performance this time was quite short but let us hope that some time, possibly in the very near future, they'll be able to be with us a little longer.

The husky voices of the members of the University of Pennsylvania Glee Club came through from station WIP with a great selection of solos, duets, trios, quartets, college, popular and classical songs. On the same program was an address on the "Career of Benjamin Franklin." This program was offered in commemoration of the 218th birthday of Benjamin Franklin.

Station WLW gave us a good time with its one act radiario entitled "Ile," as performed by the Crosley Radarians. This, plus the splendid selections played by Carey's Orchestra, proved a real treat.

Loud Speakers Tried on Steamship

WHEN the steamship "Kroonland" of the Panama Pacific Line cleared the bar at Sandy Hook recently on her way to California ports via the Panama Canal, there began an interesting test with portable radio loud speakers at sea.

The ship has been equipped with portable loud speakers that will enable her passengers in all three classes to hear music, speeches and other matter broadcast from shore stations, and it is expected by M. J. Schaefer, her chief radio operator, that she will be in constant touch with stations in New York state throughout the entire 5,200 miles of the voyage between New York and San Francisco.

The preparations made for broadcasting the eastern programs to all classes of the Kroonland's passengers on the coming voyage resulted from a discovery made on her last voyage from San Francisco and Los Angeles that music broadcast from Station WGY, N. Y., could be picked up when the ship was 500 miles from Los Angeles, as clearly as if she were off the port of New York.

When this discovery was made, a loud speaker had been placed on deck, and first class passengers began dancing to the jazz music coming from the General Electric station, across the continent and 500 miles of sea, a distance of about 4,000 miles. Captain Thomas W. Garlick, the ship's commander, was taking a nap at the time, and hearing the music outside his door, came out with a rush to learn where it was coming from.

Naval Officers and Radio Men Lose Lives

THE U. S. S. "Tacoma" recently was on Blanquilla Reef, outside the Harbor of Vera Cruz, Mexico, where she had been ordered to restore cable communication. Her commander, Captain Herbert G. Sparrow, six officers and 48 men stuck to the ship while the remainder of the crew were put ashore.

On January 22 a violent norther sprang up and completed the wreck of the "Tacoma." The Mexican revolutionists sent out from Vera Cruz several small vessels and courageously rescued most of those on the "Tacoma." Captain Sparrow and two radio men, however, were lost.

New Radio and Electrical Firms

Quality Radio Products Co., New York City, $1,000; S. Salzberg, J. Levy, M. Bleicher. (Attorney, M. Bolit, 220 Broadway.)

Labelle Radio Co., New York City, make loud speakers, $5,000; M. and S. Rosen, A. A. Aswel. (Attorneys, Feldman, Streicher & Feldman, 154 Nassau St.)

Fraser Electric Transmission Corp., Wilmington, Del., manufacture, $10,000,000. (Corporation Trust Co. of America.)

Standard Electric Products, Dover, Del., $250,000. (Capital Trust Co. of Delaware.)

Rapp & Bailey Corp., New York City, radio supplies, $6,000; R. Rapp, B. L. Bailey. (Attorney, M. Klein, 261 Broadway.)

Kingsway Light House, Brooklyn, electric supplies, $5,000; M. Bander, G. Sleicher, J. Strauss. (Attorney, J. N. Kraeger, 176 Midwood St., Brooklyn.)

Kirkaldy Engineering Corp., New York City, 200 shares preferred stock, $100 each; 1,000 common, no par value; S. Lippman, F. J. Byrne, W. R. Roct. (Attorney, S. Anderson, 233 Broadway.)

Strand Radio-Kraft Corp., Brooklyn, N. Y., 250 shares preferred stock, $100 each; 5,000 common, no par value; L. Meisel, S. A. Joffee, S. Weisman. (Attorney, J. I. Weisman, 38 Park Row.)

Post Electric Co., New York City, $20,000; H. A. Wehrman, S. H. Balzer, W. H. H. Myers. (Attorney, H. K. Tobias, 130 East 15th St.)

Berloid Products Corp., New York City, radio parts, $6,000; L. Knobel, J. Benjamin, L. Wolfe. (Attorneys, Cohen, Haas & Schimmel, 302 Broadway.)

Standard Electric Products, Dover, Del., incorporated for $250,000. Attorney, Corporation Trust Co. of America.

S.-K. Radio Products Co., New York City, $5,000; M. Stockman, D. Kamp, L. Pollock. (Attorney, S. Sufrin, 201 Broadway.)

Cram & Barnes, Tuxedo, N. Y., electrical and mechanical engineers, $50,000; C. R. Cram, F. S. Barnes, R. E. Husted. (Attorneys, J. W. & P. V. D. Gott, Goshen.)

Frank Radio Corporation, New York City, $50,000; J. M. Donegan, M. V. Kress, R. Snow. (Attorney, M. D. Kepple, 66 West 40th St.)

Radio Fans Save Two from Death by Fire

A FIRE in a New York rooming house might have taken the lives of one of the roomers and his guest at 4 o'clock one morning recently if Mr. and Mrs. Robert Johnston had not been sitting up to pick up by radio a midnight concert in San Francisco. Their quick call for firemen resulted in the two men being carried down alive from the fourth floor landing, where they had been overcome by smoke.

Radio for New York Police Airplanes

THE seven police airplanes now in hangars at Fort Hamilton, Brooklyn, N. Y., are to be equipped with radio sending and receiving apparatus, according to Inspector General Charles H. McKinney of the Police Department. The 200 members of the police reserve aviation division are now being trained for radio work, and recently Paul C. Hoernel, electrical engineer of the Western Electric Company, lectured to the reserves on the use of radio in flying.

The planes are to be equipped with radio outfits before May 1, it was learned. Just how the expense of this equipment was to be met is not known. Commissioner Enright has applied on several occasions to the Board of Estimate for $15,000 with which to equip the planes with radio sending and receiving sets, but each time the appropriation was disallowed.

Spreckles Buys Federal

RUDOLPH SPRECKLES, president of the United States Bank & Trust Company of San Francisco, announced last week that he had acquired control of 100,000 shares of stock of the Federal Telegraph Company. The total number of shares of the company is 300,000. The company recently closed with the Chinese Government for the installation of wireless stations in that country.

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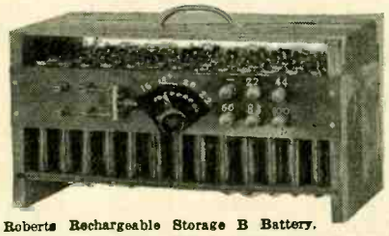

WHAZ Heard on the Yukon

THAT government officials, mounted police and others in the Canadian Northwest, in the northern outposts of the continent, enjoy the programs broadcast from the Rensselaer Polytechnic Institute radiophone at Troy, N. Y., is indicated by a letter just received, though mailed nearly a month ago at Dawson in the Yukon Territory on the border of Alaska. WHAZ station is heard with considerable regularity at greater distances—Dawson being approximately 4,000 miles from Troy, about as far as London or Glasgow or the Hawaiian Islands, which frequently report hearing the Troy Tech broadcasts—but there is a glamour and a touch of romance about the open places on the world's retreating frontiers that only serves to increase the wonder that radio penetrates their fastnesses and takes to them the best of the world's music, entertainment and educational discourses. The letter follows:

Department of National Defense,
Dawson, Yukon Territory.

WHAZ,
Rensselaer Polytechnic Institute,
Troy, New York.

Dear Sirs:

Just a line to congratulate the lady who sang "Sing Me to Sleep," about 11:45 hours your time, on the night of December 17, 1923.

Received same over a one, one and two stage set (transformer coupling.)

Yours truly,
C. G. MAY.

Radio a Government Monopoly in Poland

OWNERSHIP and operation of radio stations in Poland rests exclusively with the authorized departments of the Polish Government, according to advices to the Department of Commerce. A bill, however, has been pending before the Diet for the past several months by the terms of which amateur or privately-owned receiving stations will be authorized under government control. There is only one factory in Poland making radio apparatus. Its output is confined principally to army requirements. Vacuum tubes and other parts are imported from Germany.

Austrian Wireless Service Begun

THE Austro-Marconi Radio Company recently inaugurated a regular Austrian wireless service. The opening was attended by the chiefs of the government and representatives of the business world in Vienna. The first messages sent out were addressed from Chancellor Seipel to the League of Nations at Geneva; from Burgomaster Sietz to Mayor Hylan of New York. from Police Chief Schojer to Commissioner Enright, New York, and from the Chamber of Commerce to the Chambers of Commerce of New York and London.

Back numbers of Radio World supplied at regular price of 15c. a copy. Any 7 copies for $1.00. Radio World, 1493 Broadway, New York.

Letting the Radio Audience Name a Song

By LOUIS BREAU

CHARLIE TOBIAS and the writer, who are song writer-publishers and pioneers in the art of presenting song hits via the ether, had a rather novel experience recently. We have broadcast within the last two and one-half years from stations WGY, WJZ, WEAF, KYW, WOR, WHN, WDAP, WMAQ, WAAM and others.

We have found that radio is of great assistance in popularizing our song hits and a most recent case of making a song nationally popular through the aid of broadcasting stations is our "Hot Roasted Peanuts." Our latest radio hits are "There's a Bend at the End of the Swanee" and "In the Old Arm Chair."

About six months ago we wrote a fox trot containing a very novel rhythm. The melody was given a hearing before recognized music critics and the comments were favorable enough to warrant us in concentrating on the exploitation of the number. But here's where the hitch came. It was such a distinct rhythm that we were stuck for a suitable title.

In desperation we went to several of the leading lyric writers on Tin Pan Alley and asked for suggestions, but nobody could hit on a title that we felt fully typified the melody. Then one night we hit upon a wild idea—why not give our invisible radio audience an opportunity to pick the title for us?

We know from experience how many ambitious song writers there are around the country, who never have a chance to express their talent and we felt that among the many million listeners-in there would be one popular song enthusiast who would hit upon an appropriate title for our poor little unnamed song.

Station WHN started our idea on its way and since that night we have received upward of 5,000 letters, telegrams and phone messages with suggestions for titles, several of which are a perfect fit for the song. We will run the contest three weeks longer so that everybody will have an opportunity to do some suggesting.

The winner's name will appear on the title page of the song and he will be given credit for the name. The winner will also have an opportunity to assist Breau & Tobias in writing the lyric for which a royalty contract will be issued.

If you see it in RADIO WORLD you know it's so. If you hear about it somewhere else, you can find it in last month's issues of RADIO WORLD. Start keeping that file now and show your children how you got all your radio information.

Likes the Radiation Interference Conference

"I have just read your notice calling a conference on the re-radiation evil. I think it is one of the most needed improvements that could be made for broadcast listeners. Kindly accept my heartfelt thanks."—E. O. Scott, Ann Arbor, Mich.

Come on, Fellows! Let's all build that Superdyne that appeared in RADIO WORLD for Dec. 15, 22 and 29. It's the best thing that the past year brought out. Start it now!

Radio World's Complete Broadcasting List

appeared in last week's issue, dated January 26.

Another complete up-to-the-minute list will appear in an early issue of RADIO WORLD.

A CROSLEY RADIO MESSAGE

In February, 1920, Powel Crosley, Jr., then engaged in the manufacturing business in Cincinnati, became interested in radio. Production of radio apparatus was commenced shortly afterwards under the name Crosley Manufacturing Company. About January 1, 1923, Powel Crosley, Jr., and his associates acquired the capital stock of The Precision Equipment Company, one of the original licensees under the Armstrong patent.

The growth of the two institutions known as Crosley Manufacturing Company and The Precision Equipment Company in the radio field has been phenomenal. The public recognizing unusual value, has clamored for the products of these two companies. Both institutions have been operated entirely independently of each other, but for various reasons, merger has been effected in the following manner:

The name of The Precision Equipment Company, of which Powel Crosley, Jr., was and continues to be President, has been changed to The Crosley Radio Corporation.

An arrangement has been made whereby the business of the Crosley Manufacturing Company in its entirety has been taken over by The Crosley Radio Corporation. Thus many economies will be effected in production, administration, management, advertising, and in many other ways. The same policies will be effective as heretofore, with the same personnel in charge.

Believing the Crosley Manufacturing Company and The Precision Equipment Company have each individually been producing more radio receiving sets than any other manufacturer in the world, an idea may be obtained as to the volume of production made possible by uniting the two institutions.

The Crosley Radio Corporation now occupies three large plants in the city of Cincinnati, including its own wood working cabinet plant. A fourth plant larger than the present three combined has just been purchased for additional expansion.

The products of the Crosley Manufacturing Company have carried the trade name "Crosley"; those of The Precision Equipment Company the trade name "Ace". In the future all products of The Crosley Radio Corporation will bear the trade name "Crosley".

Practically every dependable radio dealer in the United States sells Crosley apparatus; if not, he can get it for you. The success of the name "Crosley" in the radio field is founded upon a well defined policy of producing efficient radio apparatus, simple in construction, in large quantities to be sold at moderate prices. thus thoroughly living up to the Crosley slogan "Better—Cost Less".

Following Is a List of the Most Popular Crosley Receiving Sets With Their Prices

Crosley Type V (formerly Ace) one tube regenerative	$20.00
Crosley Type 3-B (formerly Ace) three tube regenerative	50.00
Crosley Type 3-C (formerly Ace) consolette model	125.00
Crosley Model VI, two tube, incorporating radio frequency	30.00
Crosley Model X-J, four tube, incorporating radio frequency	65.00
Crosley Model X-L, four tube Consolette	140.00

Mr. Leonard H. Weeks, Minot, North Dakota, the only amateur in the United States consistently handling traffic with Captain Donald McMillan, North Pole, uses the $20 and $50 receiving sets mentioned above.

Armstrong regenerative receivers, manufactured by The Crosley Radio Corporation, are licensed under U. S. Patent No. 1,113,149.

Send for complete Catalog of Crosley Receivers and Parts giving name of your jobber.

The Crosley Radio Corporation owns and operates Broadcasting Station W L W

THE CROSLEY RADIO CORPORATION

POWEL CROSLEY, JR., President
FORMERLY
The Precision Equipment Company *and* Crosley Manufacturing Company
2401 Alfred Street Cincinnati, Ohio

—— *The Largest Manufacturer of Radio Receivers in the World* ——