

A 1-TUBE SET OF GREAT VOLUME

# RADIO WORLD

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VOL. 6. NO. 9. ILLUSTRATED EVERY WEEK

Pepping Up  
Your Neutrodyne

An Electrolytic  
Detector

A 2-Tube Quality  
Set for Speaker

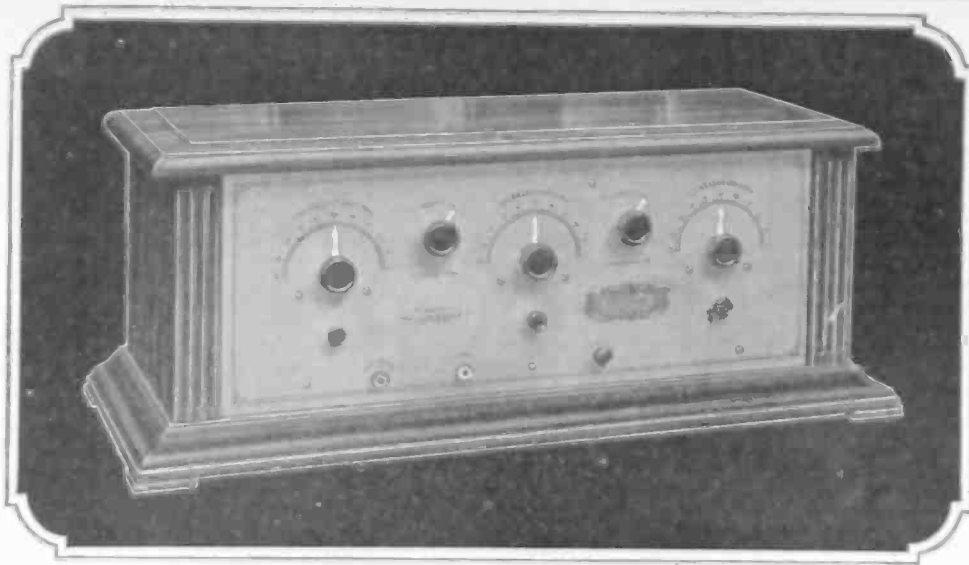
How to Select the  
Best Parts

THE RADIO  
PRIMER

In this issue: J. E. Anderson,  
Charles H. M. White, Lieut.  
Peter V. O'Rourke, Abner  
J. Gelula, Brewster Lee,  
Herman Bernard.



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# RADIO WORLD

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## The 4-Tube Superdyne As Perfected by J. E. Anderson on Low-Loss Lines Gets Clear-Toned Signals

One Stage of Reverse Feedback RF, Tube Detector and Two Stages of Transformer-Coupled AF

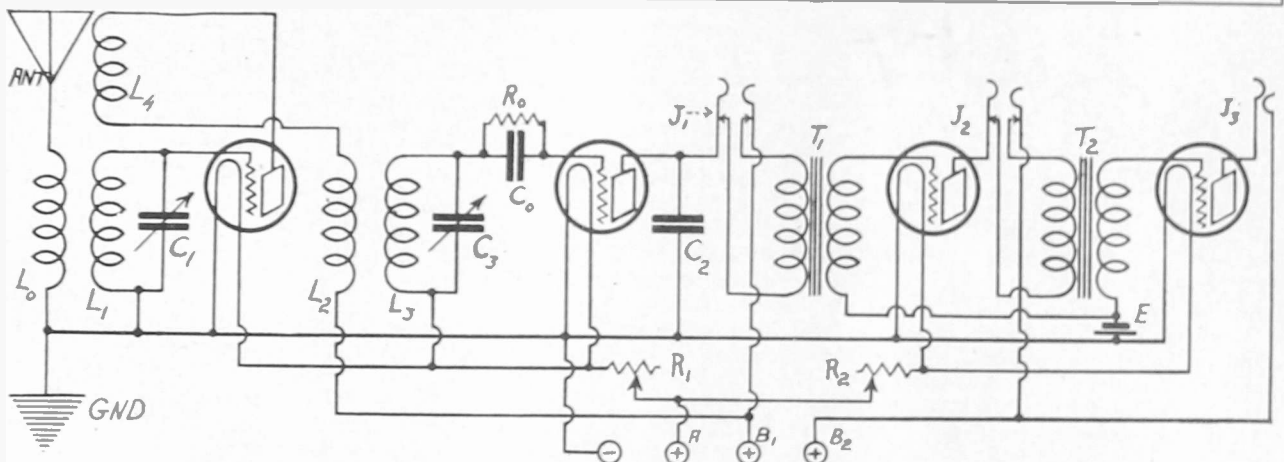


FIG. 1, the circuit network of Anderson's DX Superdyne. A semi-aperiodic winding, with one tap for connection common to ground and both coils. The main tuning is done by the L1L1 combination. L4 is the tickler or rotary coil, with the reversed feedback taking place from that coil to L1. L2L3 is a radio-frequency transformer, the secondary tuned by C3, which combination is in the detector circuit. The rheostat R1 is common to the RF and the detector tubes, while R2 controls both AF stages. The set has three controls, L4, C1 and C3. A C battery, marked E, is used in the detector. The detector, the first AF stage or the second AF stage may be plugged in.

By J. E. Anderson  
Consulting Engineer

### PART I

THE Superdyne, recognized from its first appearance as a very sensitive and selective receiver, may be made much more selective and sensitive by the application of the low-loss idea in its construction. Stations never heard before may be coaxed in on the loud speaker. This circuit is a great DX getter.

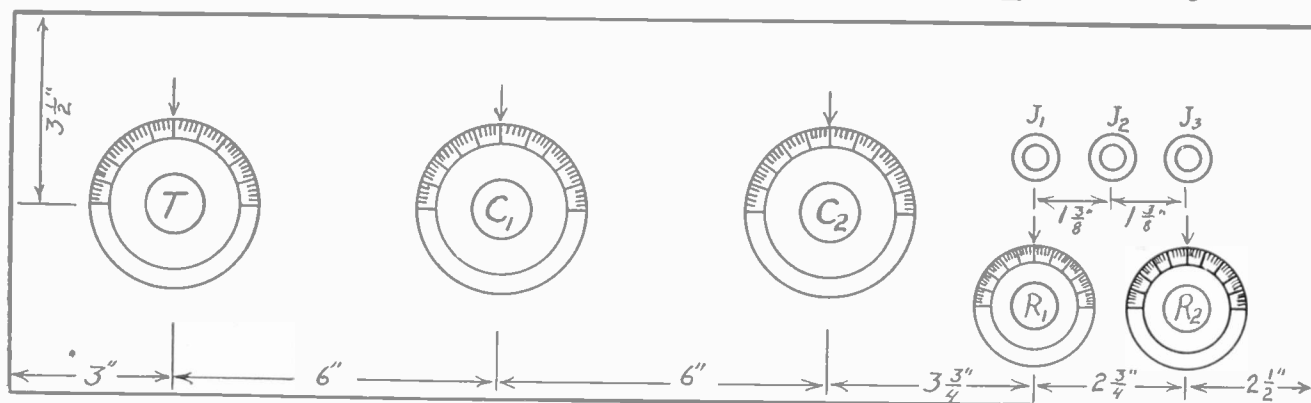
The circuit (Fig. 1) has the reversed tickler on the first tube or radio-frequency amplifier whereby oscillations in that tube are controlled. The tickler may be used to control regeneration. The circuit has fixed coupling between the antenna coil and the secondary of the first tuner. It also employs fixed coupling between the primary and the tuned secondary of the interstage coupler (L2 L3). The detector is standard and so is the two-stage audio-frequency amplifier for loud-speaker operation. Special attention has

been paid to making the radio-frequency part of the receiver really low-loss and efficient.

Those who do not wish to construct their own tuners may obtain the commercial products. There are several efficient makes. Some of the tuners are so arranged that no change is necessary to reverse the tickler, as this coil may be rotated through an angle of 180 degrees. Others only require that the flexible leads be reversed. There are also excellent coils on the market which may be used between the radio-frequency amplifier and the detector. These, of course, may be of simpler construction than the first tuner since there is no tickler. If coils are purchased, however, they must be truly low-loss. The coil should be wound with a heavy conductor. The wire should not be excessively heavy, however, because for high frequencies the eddy currents set up would introduce losses which would more than offset the gain attained by the low resistance of the wire. The turns of the coil should be spaced so that the distributed capacity will be low and the insulating material between and around the turns should be the least possible. The coil should be self-supporting as nearly as possible. The primary and the tickler coil need not be



# Coils for Anderson's Superdyne



PANEL layout for Anderson's 4-tube DX Superdyne that works a speaker.

wound with heavy wire because the signal strength is not greatly dependent on it, and if heavy they will introduce eddy current losses into the main tuning coil, the secondary (L1).

A type of coil which has proved satisfactory is the so-called basket-weave coil. On a hard piece of wood about 4" square and  $\frac{3}{4}$ " thick, or preferably on a metal slab of the same dimensions, describe a circle of exactly 3" diameter. (Fig. 2). Then with a pair of dividers divide exactly the circumference of this circle into 15 equal arcs. This may also be done with a protractor by dividing the entire circle into 15 equal angles of 24 degrees each. If the dividers are used set these so that the distance between the points is  $\frac{5}{8}$ ". This is very nearly equal to the length of the chord subtended by a 24 degree angle on a 3" circle. When the points have been located centerpunch carefully and then drill holes nearly through the board. This drilling cannot be done with a hand drill very well because the holes will not be at right angles to the board, and a neat job cannot be turned out unless they are. The drill used should be of such size that either a  $\frac{3}{16}$ " or a  $\frac{1}{4}$ " dowel or rod will fit close without forcing. When the drilling has been completed, cut fifteen rods or dowels from 3" to 4" long and insert these in the holes. These rods should be quite stiff so that they will not bend greatly when the wire is put on, because if they do the coil will be of the shape of a truncated cone rather than a cylinder. The rods will be at right angles to the base.

With the rods in place proceed with the winding. There are several ways in which a basket-weave coil may be wound, but for self-supporting coils the method of "under two, over two" is probably the most satisfactory. (Fig. 2) The solid line represents the first turn, the dash represents the second, and the dotted line the third. The winding is continued in this manner until the required number of turns have been put on. In starting the winding of the terminal of the wire may be anchored by wrapping it around one of the rods, or it may be tied to a tack in the board.

A satisfactory size of wire for this diameter is No. 20 double cotton covered. This has a low direct current resistance and is not so heavy that eddy currents will be serious for broadcast frequencies. Its insulation is bulky so that the turns will be separated, yet it does not introduce a lot of solid dielectric. No. 18 DCC copper wire is also satisfactory, but the coil wound with it will be bulkier, and it would require a turn or two more for the same inductance because of its greater length of winding, or because of its lower diameter to length ratio. The coils will be described wound with wire of the same size.

The antenna coil L0 and the secondary L1 of the first tuner are put on the form in one continuous winding of 65 turns. A tap is brought out at the 15th turn for the ground connection, the 15-turn end of the coil being used in the antenna circuit and the 50 turn end in the grid circuit. The

tuning condenser is connected across the 50-turn section only.

When the requisite number of turns have been put on it remains to bind the coil together so that the rods may be removed without danger of the coil collapsing. The coil may either be worked up the rods gradually and temporarily tied together with cotton twine, then slipped up clear of the rods and sewed permanently; or the rods with the coil on them may be worked out of the board, and then the coil sewed as the rods are removed one by one. The coil is sewed with cotton twine. Use a crocheting needle, running it through one of the meshes, the twins hooked over the point, and then pulled through the mesh with the needle. In this sewing the triangular meshes rather than the diamond-shaped are used, and the twine is run through each triangular mesh twice, in opposite directions, until the sewing has progressed around the coil twice on the outside circumference and twice on the inside.

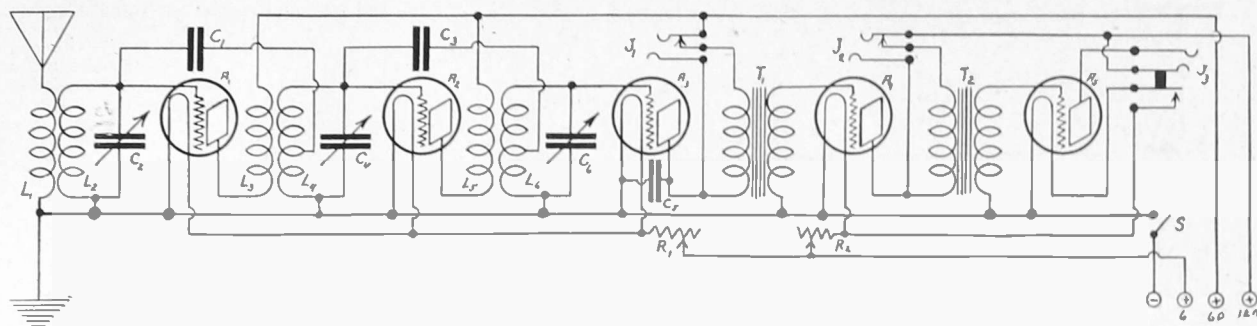
The interstage radio-frequency coupler L2L3 is prepared in the same manner. The primary L2 is put on the form first and it should contain eighteen turns. When these turns have been put on the wire is cut, allowing several inches slack for the terminal. Then the secondary L3 is put on, with  $\frac{1}{4}$ " space between coils. It is wound in the same direction as the primary, and the number of turns should be 50, the same as L1. The terminals of this coupler should be numbered from 1 to 4 in the order in which they are put on, for reference in wiring up the circuit.

The tickler coil L4 may be wound in a similar way except that its diameter should be 2" and that much finer wire may be used for the winding. No. 24 or No. 26 double cotton or double silk covered wire will give satisfaction. About 40 turns should be used. This coil may also be wound in the spider-web fashion, and in that case the outside diameter may be nearly as large as the inside diameter of the tuning coil. The average radius of the spider-web coil should be 2" and the number of turns forty. The tickler may also be made by winding forty turns of No. 26 DCC wire on a 2" bakelite tubing.

The tickler coil is mounted near the grid end of the tuning coil, not inside but close enough so that part of the tickler sweeps out an arc inside as it is turned. The mounting of the tickler should be by means of a non-metallic shaft, such as a  $\frac{1}{4}$ " wooden dowel, a rod of bakelite or hard rubber. If it is desirable to have metal at the bearings of the shaft, the non-conductor may simply be an extension of the metal shaft. It is used to keep unnecessary metal out of the strong magnetic field of the tuning coil. If the spider-web or the basket-weave forms of tickler be selected it is not necessary to have a support at each side of it because either is very light and the bearings at the panel will suffice. The other form of tickler may require support.

[Part II, the conclusion of J. E. Anderson's article, will be published next week, issue of November 29, out Wednesday, November 26].

# Rousing Dormant Neutrodyne



THE CIRCUIT DIAGRAM of the Neutrodyne, convenient to have handy on a trouble-shooting expedition. The Neutroformers, or RF coils, are L1L2, L3L4 and L5L6. The tubes are A1, A2, A3, A4 and A5. C1 and C3 are neutralizing condensers. C2, C4 and C6 are the tuning controls, all variable condensers. R1 and R2 are rheostats. No grid leak or grid condenser is shown in the detector circuit as the grid return is to the A-, the 200 type tube being used. With a different tube there would be a grid leak and condenser, with grid return to A+.

By Charles H. M. White

Consulting Engineer.

THE Neutrodyne receiver is a tuned radio-frequency receiver using small capacity condensers known as Neutrodons, as stabilizers for the radio-frequency amplifying tubes. Almost any experienced operator can make repairs or adjustments.

Many Neutrodyne sets are not giving all possible DX reception and there are many more that lack the correct amount of pep. This condition can be traced. Owing to the extreme and delicate balance at which a good Neutrodyne must work to give peppy results, a very good radio-frequency amplifying tube must be used. A tube may give splendid results in a regenerative circuit and still when used in a tuned radio-frequency circuit it will fall flat, and, when the operator happens not to have a spare tube around this condition is not readily detected, except by changing tubes around. Therefore the first thing to do with your weak Neutrodyne is to shift tubes. It will be generally discovered that the poor radio-frequency tube may be perfectly satisfactory in the audi-frequency amplifier, unless the tube is inherently defective. As far as I have ever tried and experimented the best results are obtained with the 201A type tubes throughout, although if this type be used for the detector a grid leak from 3 to 5 megohms must be used. Do not replace a 200 soft detector with a 201A without reducing the resistance of the grid leak. Never attempt to operate a Neutrodyne with the WD type of tubes and expect to get more than fair results. Various experimenters have reported that the 199 works fairly well if care is taken to insert the proper amount of C battery, yet, I have tried it and the results obtained could not compare favorably with the 201A tubes.

The proper functioning of a Neutrodyne or any tuned radio-frequency receiver depends upon the employment of at least 90 volts of B battery, and many work better with 135 volts. With such high plate voltages and dry cell B batteries the consumption of battery energy is quite rapid unless a C battery is used. Yet few manufacturers of Neutrodynes have provided terminal connections for C batteries. Such can be made, however, by any experienced radio fan who has played around with circuit connections. A separate C battery had better be used for the radio-frequency and the audio-frequency tubes, respectively. This is done to keep the grid leads as short as possible, although electrically, it is perfectly feasible to use one common battery. Do not place a C battery bias on the detector. To insert C battery in the radio-frequency circuit, trace the grid return wire from the grid to the negative side of the filaments of the first two tubes (the radio-frequency amplifying tubes) of the set. At the

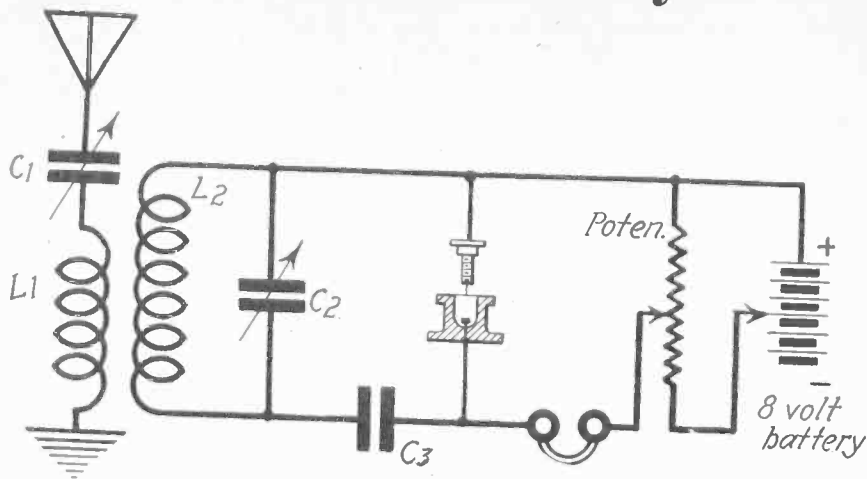
filament junction break the two grid return wires and joint and solder them together. Between this soldered junction of the first two tube grid returns and the negative filament side of the A battery insert the little C battery, joining the positive terminal of the C battery to the negative leg of the A battery, and, connecting the negative terminal to the two grid return wires. By a similar operation on the fourth and fifth tubes of the set, the C battery can be inserted in the audio-frequency amplifier. This operation only holds good for a straight 5-tube receiver. If you have a reflexed 4-tube receiver of the tuned RF type do not attempt to place a C battery bias unless you have the expert advice of the manufacturer as to how best to do it.

After the insertion of a C battery it will be found that the stability of the circuit will be altered and that the receiver will oscillate if the tubes are turned up on the radio-frequency stages. This can be altered by a readjustment of the Neutrodons or by the insertion of variable neutralizing condensers, which I believe are the best. There are several variable types that can be mounted on the panel and adjusted from the outside of the cabinet while the receiver is in operation. Turn the tubes up to normal brilliancy, not too bright, and then adjust the stabilizing condensers so that the receiver is just about to oscillate when the dials are tuned to a certain station. This adjustment may not be easy, and should always be attempted when a fairly distant station is on the dials. A local station will make very little difference in a fine adjustment, as far as volume is concerned. If you can not at any adjustment of the Neutrodons stop oscillations and whistling, then resort to this stunt: Place a single turn of short circuited wire on the second Neutroformer. This will add stability to the most jumpy circuit. It should be noted that the position of this wire will greatly affect the amount of stability, therefore try this wire in several places on the Neutroformer. Generally, the end of the coil tubing will give the best condition.

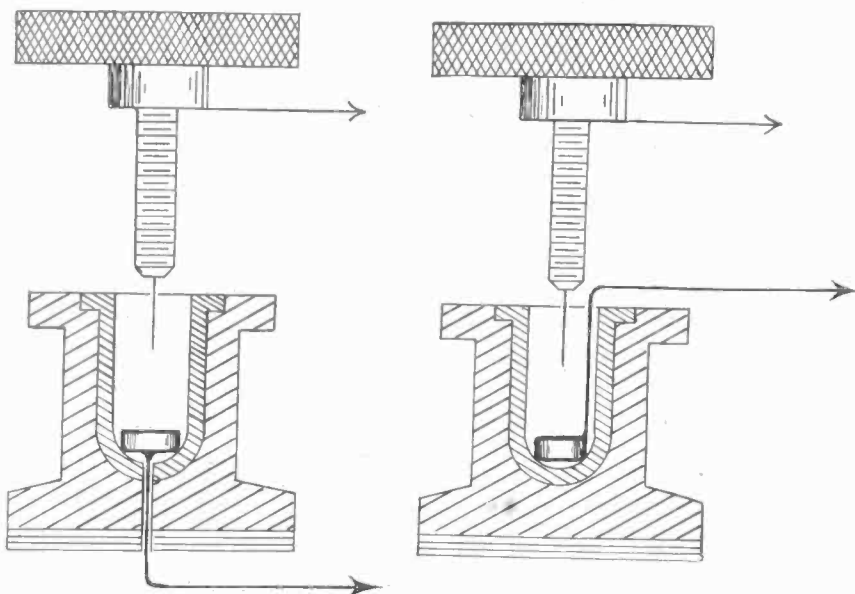
If your panel layout permits, the sensitivity of your Neutrodyne can be increased by adding a variometer in the plate circuit of the third or detector tube. Electrically this is done by breaking the detector plate circuit at the plate terminal of the tube socket, and inserting the variometer in the opening. In tuning, leave this variometer at the zero dial position and tune in as usual, and then increase volume by means of the variometer dial control.

In general there are many benefits to be reaped by making these improvements if your Neutrodyne is not giving you the correct results. As yet there has been developed no good way of operating a Neutrodyne on a loop aerial, but I understand some such improvement is in the air.

# An Electrolytic Detector



HOW the electrolytic detector is placed in a circuit. It is important that the positive pole of the battery be connected to the platinum wire, the negative pole to the platinum or zinc or carbon electrode. If a zinc or carbon electrode is used no local current is required and the electrolyte is connected as any standard crystal detector. Platinum is advised as it is more sensitive to weak pulsations.



AT LEFT is the electrolytic detector showing how the lead-out wire from the platinum or zinc electrode is accomplished. At the right is the same detector, but the electrode lead-out wire is brought up through the cup. The system at the left is far better. The two connections are made from the fine wire and the large electrode.

## By Brewster Lee

IN the early stages of radio development, before the days of the carborundum, the electrolytic detector was acknowledged to be without a peer. I believe the electrolytic is absolutely the second best detector. The tube comes first.

For the experimenter here is a field whose surface has hardly been scratched. It presents an oscillating detector which has been practically forgotten since the advent of the vacuum tube.

Of late, the electrolytic cell or detector has fallen into almost complete disuse, even though its reliability is generally admitted, perhaps because from a commercial viewpoint its first adjustment is rather troublesome. However, this should be no drawback for the experimenter looking for new fields to conquer.

### Materials You Need

The materials needed are: a test-tube melted to half-size, a thin piece of platinum about 1/2" square (cost, about \$2), a platinum wire, about .0001 inch diameter, a 20% solution of nitric acid.

The platinum wire is generally coated with silver, which is dissolved by careful dipping of the TIP only in the nitric acid

solution. It is exceedingly important that only the extreme tip be inserted in the acid, as the detector will not operate efficiently, if at all, if the fine wire is placed too far in the acid. The silver tip is dissolved by the action of the nitric acid and a fairly strong local current sent through the wire. The point then is adjusted so that it just touches the solution.

If the detector is placed in the circuit (Fig. 1) it will be found very sensitive, provided that the fine-wire electrode just touches the surface of the solution.

Quite often, the fine wire is coated with glass and broken at the extreme tip. This insures continuous adjustment, as it will make little difference as to the depth of immersion of the platinum wire.

Several theories have been advanced to account for the action of the electrolytic detector, one being that the response in the headset is caused by changes in resistance of the small platinum wire during the passage of the radio-frequency currents.

### Adjustment of Detector

The electrolytic detector is adjusted for maximum signal strength by careful variation of the external current. If the current is too strong, a hissing sound will be heard in the receivers that will exclude

signals. If the local current is too weak the detector will barely respond. A difference of opinion exists regarding the direction of the flow of current through the detector, but it is often conceded that the fine wire electrode is connected to the positive side of the cell or battery.

It has been discovered that the large electrode may be of zinc and the smaller electrode of platinum wire, as above described. If the zinc is used as an electrode, no battery will be required in the set, as it generates its own current. Carbon also may be used for the large electrode.

Do not connect the large electrode to a copper wire so that the copper wire is also immersed in the solution. The acid eats into the copper, thus spoiling the solution and the action of the detector.

As indicated in Fig. 1, approximately 8 volts should be used as local current, in connection with a potentiometer.

L1 and L2 are the primary and secondary, respectively, of a standard variocoupler. C1 is a 43-plate variable condenser, C2, a 17 to 23-plate condenser, C3 a .001 mica fixed condenser.

### Results Are Excellent

It is well to have good control of the platinum point, therefore it is advisable to have the adjustment of the screw type. You may be assured that, if care is given the construction of this instrument, the result will be truly a detector that is surpassed only by the vacuum tube, and then only slightly. Its tone is better than the vacuum tube. In a reflex circuit, or as a detector with just two stages of audio-amplification, its tone quality is nearly perfect. The electrolytic, properly hooked up, gives volume, wonderful tone, no circuit noises, is exceedingly staple and a distance-getter.

[Those who construct any part or circuit published in RADIO WORLD are requested to write the Results Editor, RADIO WORLD, 1493 Broadway, New York City, and state how they fared. When possible give the trade names of the parts used, or the manufacturers' names. Results letters will be published, including trouble-shooting letters. Readers may include questions in the same letter. The questions will be answered in the University Department.]

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## The Weekly Rebus

WHAT does this rebus represent? Send answer to Rebus Editor, RADIO WORLD, 1493 Broadway, New York City.



The names of those sending the solution will be published.

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B. J. Killeen, 34 Indiana St., Wheeling, W. Va.

# A Quality Set for Locals

By Lieut. Peter V. O'Rourke

MOST persons, at least at one stage of their radio development, are fervently interested in distance reception, and all their tales of logging are punctuated with reference to DX. However, many persons, especially those living within 100 miles of several excellent broadcasting stations, are satisfied to hear these alone. Such stations are classed as "locals." For DX reception, unless multi-stages of cascaded radio-frequency amplification be used, a tube must be the detector. But for locals a crystal may be employed, the quality of speech and music increased out of all proportion to the reduction in volume. The "local fans" are likely to be strong for quality, and although on a percentage basis they are indeed a minority, radio should be conducted on the principle of a respectable regard for the rights of minorities. Hence this article about a set that works locals on a loudspeaker, although employing only two tubes. There are one stage of tuned transformer-coupled radio-frequency amplification, crystal detector, one stage of audio-frequency amplification reflexed in the RF stage, and one straight stage of audio, this being the second audio. This is a mighty fine set indeed and is selective enough to meet nearly all needs of to-day, except to solve the problem of those living within five miles of two or more broadcasting stations.

The coils are wound spider web fashion, on a form having a 5 1/2" outside diameter. The hub is 1 1/2" diameter, leaving 2" for the length of each spoke or arm (Fig. 2). Using tracing paper, copy the form twice, then paste the tracing paper on two pieces of stiff cardboard, 6x6". Cut the form with shears. Using No. 22 double cotton covered wire throughout, wind the two coils, L1 L2

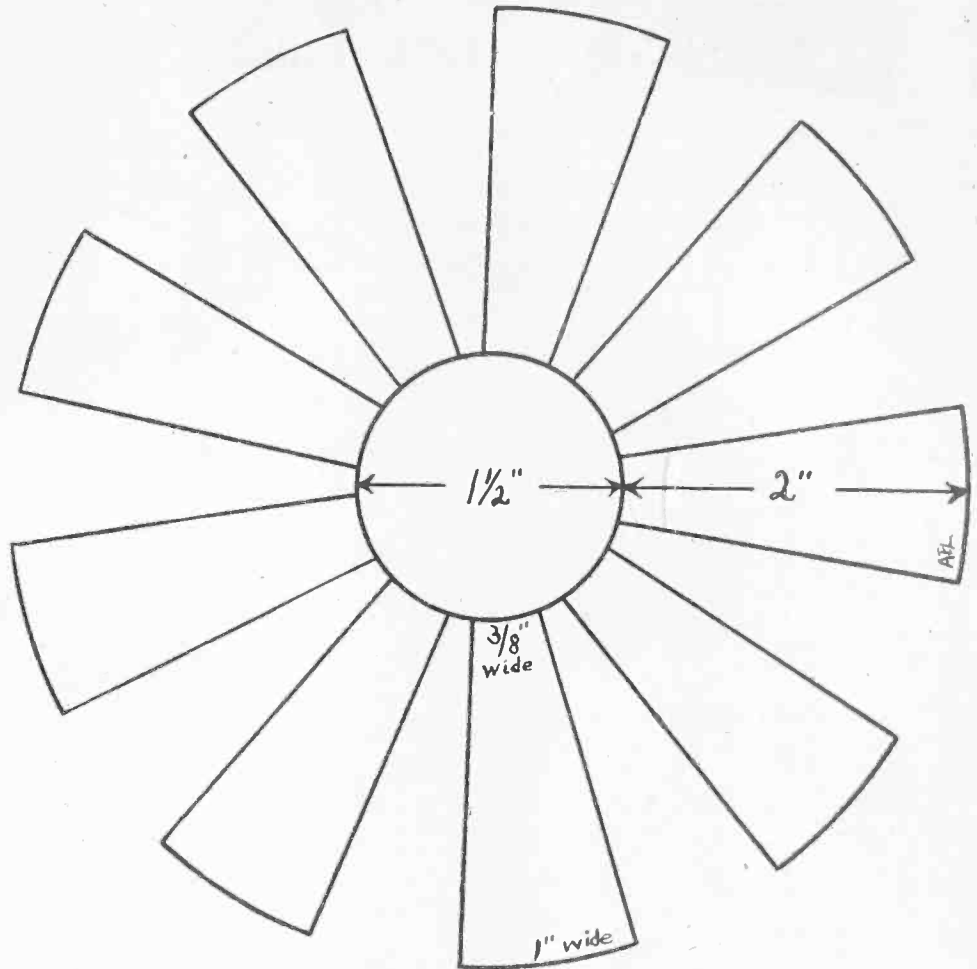


FIG. 2, form for winding spider-web RF transformers.

and L3 L4 identically. Measure off 12 feet for the primary of each and 45 feet for the secondary. You now have four lengths of wire. To make the first RFT, wind ten turns of the larger stretch in and out of succeeding arms of the form, leaving 5" at each terminal now and later for connections.

The ten turns put on, now pick up one of the short lengths of wire and wind it simultaneously with the continuation of the other winding, until within 5" of the end of the shorter length, which is looped around one of the spokes for permanency. These two

(Concluded on page 28)

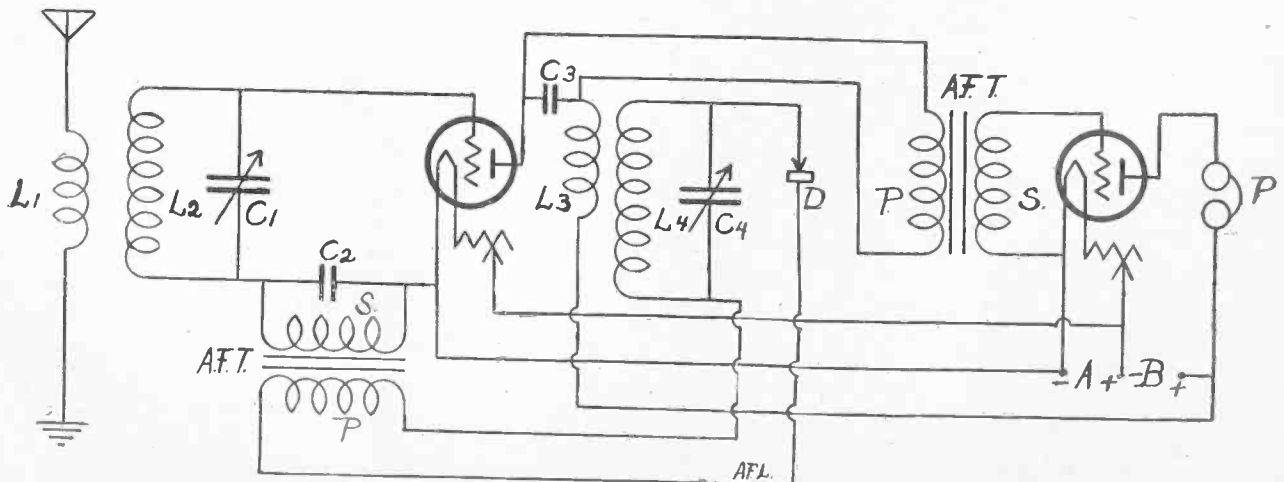


FIG. 1, wiring of the quality 2-tube set that works a loudspeaker. Connections are as follows: aerial to beginning of L1, primary of one of the two RFT transformers; ground to end of primary; beginning of secondary of this RFT (L2) to grid of first tube and to stator plates of C1. Rotor plates to end of L2 and to G post of the first AFT. Plate of tube to one side of fixed condenser C3, other side of C3 to beginning of L3, primary of the second RFT. End of L3 to B+ 90 volts. Beginning of L4, secondary of second RFT, to stator of C4 and to one side of crystal detector. Other side of L4 to remaining side of C4 and to P post of first AFT. Other side of crystal to B post of this AFT. F post of AFT goes to F-. Plate of first tube, direct from last tube, to P post of second AFT, B post to B+ 90 volts, through L3. G post of second AFT to grid of second tube, F post direct to F-. Plate of last tube and B+ 90 volts to speaker terminals or jack. A+ goes to one side of each rheostat, the other side respectively to F+ posts of first AFT. A- goes direct from battery to F- socket posts. Connect B- and A+. Put fixed condenser C2 across secondary (between G and F posts) of first AFT.

# Why the Aerial Is a Detector



**Tubes, Crystals and Other Forms of Rectifiers Explained—How to Make a 1-Tube DX Set**

*A Course in Construction for Beginners*

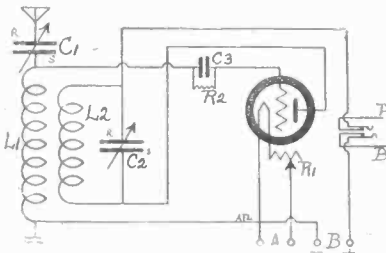


FIG. 1—A single-circuit regenerative circuit. L1 a 50-turn honeycomb coil, L2 a 35-turn honeycomb coil, C1 and C2 are 23-plate variable condensers. C3 a .00025 mica grid condenser. R2 a 2 megohm grid-leak. L1 and L2 may be a variocoupler, L2 being the rotor. Switch the leads of the tickler coil (L2) to find out if better control of regeneration will result.

## PART IV

ONE of the first terms that the radio novice learns is "detector." When mention is made of the detector, the usual impression is of a lighted bulb or a piece of galena or silicon. But, would you think of a piece of coal as a detector? Carbon is also a detector of radio-frequency currents. Nearly every mineral is, more or less. However, whether it be a vacuum tube or a piece of coal, the action for the "detection" of the signal is the same.

When the action of the detector is clearly understood, you will have good reason to wonder why the term was ever

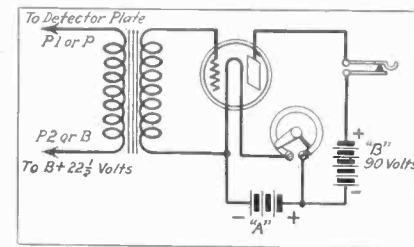


FIG. 2—A one-step audio-frequency amplifier. This amplifier gives volume, not distance. It will only increase the volume of the signal that is rectified by the first tube. A voltage of 45 to 90 should be fed to the plate (B battery).

applied to the mineral or vacuum tube.

The aerial and ground in reality constitute the detector. The phones may also be appropriately included in the detector class. But the mineral or vacuum tube—how come?

### What Ear Can Hear

When the radio-frequency currents are absorbed by the aerial they are yet in the originally transmitted form—high-frequency alternating currents. The human ear can only respond to frequencies within the band of approximately 100 to 15,000 cycles per second. Radio currents, of broadcast wavelengths, have frequencies anywhere from 800,000 cycles to 1,200,000 cycles per second—far too high for any ear to hear. Also, due to the fact that the incoming alternating current cannot

actuate the phones, it is necessary to rectify it to direct current.

Thus we see that the so-called detector is not a detector at all, but a rectifier.

### Types of Rectifiers

There are various types of "detectors" on the market today. Let us consider the better known of the many.

The Perikon detector was developed by Dr. G. W. Pickard. It consists of two crystals—copper pyrites and zincite held firmly against each other. Zincite metals are usually mounted in Wood's metal because of its extremely low melting point. Its action is similar to the above described—allowing current to pass in one direction only thus rectifying the incoming high-frequency alternating currents. This type of detector works best with a local current passing through it. The positive pole must be connected to copper pyrites side.

The electrolytic detector, described elsewhere in this issue, operates primarily in a manner as all other detectors, rectifying the incoming currents.

### Other Rectifiers

The tikker is used in the reception of undamped (continuous wave) signals. It was devised by Poulsen, and employs a small vibrator or rotary contact vibrator. No detector of the ordinary kind is used. It operates similarly to vibrating battery chargers that are in many homes. No detector of the ordinary kind is used in conjunction with it.

The Marconi Magnetic Detector is a batteryless type much used on shipboard. This instrument operates on the theory that, according to C. Maurain, any hysteresis effect occurring in an iron core, when subjected to a radio wave, is reduced. The complete detector is so arranged that a band of fine insulated iron wire revolves about two rotary drums, driven by a spring or electric motor. A magnetic frictional effect is produced in that section of the traveling iron band directly under the poles of a set of steel magnets.

### Use of Tube in a Set

The detector tube, because of its extreme sensitivity, is the most popular detector. The vacuum tube may, according to its degree of evacuation, comprise either a detector or amplifying unit. It is stable in operation, cannot be jarred out of adjustment, operates equally well under all atmospheric conditions and results in far greater selectivity.

Fig. 1 shows a single-circuit regenerative set of very simple tuning and of great sensitivity. L1 is a 50-turn honeycomb coil, L2 a 35 turn honeycomb coil. C1, the aerial tuning condenser, should be 23 plates. C2 is also a 23-plate condenser. Selectivity may be increased by placing C1 across L1 rather in series with it. C3 is the standard .00025 mica grid condenser shunted by R2, a 1½ to 2 megohm grid leak. R1 is a rheostat. The tube may be either type 200, 201A, 199, 11 or 12. The two coils need not be near each other.

Fig. 2 is a one-step audio-frequency amplifier that may be added to this or any other circuit for increasing volume. If you desire to have the amplifier used permanently, that is, without switching back to detector, the jack on the detector circuit may be eliminated. Connect the two leads that would ordinarily go to the phones to the primary of the transformer (P and B). It is best to have a fairly high ratio transformer for the first stage of amplification, approximately 6 to 1. Either a 201A, 199, 11 or 12 type tube may be used.

For the 199 tubes, a rheostat of a higher resistance will give better control of the tube—20 to 30 ohms. The 11 and 12 tubes take 6-ohm rheostats.

## By DAVID SARNOFF

Vice-President, Radio Corporation of America

### Super-Power Aids Listeners

THE broadcast station of the present one-kilowatt type located within the city emits a signal more powerful in its neighborhood than a signal received in the same neighborhood from a station fifty times as powerful located twenty-five to fifty miles from that city.

Electrical devices in the home and power transmission lines may on occasion give rise to electrical disturbances which interfere with the reception of weak radio signals. It is not feasible nor desirable to disrupt the entire electrical field in order to get such minor electrical disturbances out of the air, and some other method of avoiding the trouble must be found.

It will be noticed that in every one of the cases of interference with reception just mentioned the crux of the situation lies in the feebleness of the signal, particularly the signals from distant stations. The problem, in brief, is to produce a strong signal from distant stations, and that means super-power broadcasting. At once the detrimental effects of natural and artificial electrical disturbances are largely eliminated. The remedy is, obviously, superpower broadcasting.

In rendering a service to the public it is

desirable that this shall be a steady and dependable thing. If good signals are clearly heard in the Winter, the transmitting station should similarly produce an acceptable signal in the Summer. Daytime and night time service should be acceptable even for considerable distances from the broadcasting station.

In order that this may be achieved, sufficient power has to be provided at the transmitting station to meet the more difficult conditions of daytime Summer reception as well as the comparatively easy conditions of nighttime Winter reception. Higher power broadcasting provides the ready means of doing just this and introduces into broadcasting a hitherto unobtainable degree of stability and all-year-round evenness of reception.

By doing this, super-broadcasting will carry the best of the programs originating in the great cities of the United States into practically every home, Winter and Summer, and day and night. Once a reasonable number of super-broadcasting stations are in successful operation, every listener will get reliable service at any time from one or more of them.



# Great Volume from One Tube

By Herman Bernard

THE greatest volume I ever heard from a straight 1-tube set was obtained from one constructed as shown in Fig. 1. Some local stations were operated on the loud-speaker on this solitary tube. These stations were WNYC, using 1,000 watts, and WEA, 500 watts, both five miles distant from the point of reception. With a greater distance between station and receiver, or with less power and the same distance, the result probably would not be duplicated. On all stations, however, the volume in the earphones alone was so great that when the phones were laid on a table on a quiet night the signals could be heard all over a large room.

The set is not very selective, although sufficiently selective for eighty per cent. of the inhabitants of the United States. In areas like New York City, if one lives within three or four miles of two or more stations, interference might be expected. But outside the cities the set should prove excellent. It is not a DX set, its range being probably 150 miles, normally. Volume is its chief asset, and of that there is bounty.

### Few Parts Needed

One of the attractive features of the set is that it may be constructed of parts that most experimenters already have. The tuning items are a variometer, a variable condenser and a single coil. The variometer is standard. Any type that covers from 200 to 600 meters will work. The low-loss type of variometer is usually better than the other kind, but the volume was still there when a variometer not strictly in the low-loss class was tried. As for the condenser-coil combination, it may be any kind that will cover the broadcast band that the experimenter desires to receive. If the whole band is to be comprehended, 200 to 545 meters, it is usually impossible to do this with anything less than a 17-plate condenser in conjunction with an untapped coil. In fact, one effect of instituting the new wave band, which it now appears will not be in effect until about January 1, is to put the 23-plate condenser to the fore. This has a maximum capacity of .0005 mfd., while the maximum capacity of the 17-plate condenser usually is .00035 mfd. A 50-turn duolateral or honeycomb coil used in conjunction with a 23-plate low-loss condenser will do the trick. No vernier is necessary. If a 17-plate condenser is at hand, use a 75-turn duolateral coil or honeycomb.

### 12 Type Tube Worked Well

The set may be made on a 7x12" panel (Fig. 2), with a baseboard 6½x7" 11" (Fig. 3). Besides the two 4" dials the only parts that show on the panel are the rheostat knob R and the jack S. The rheostat knob is critical. Used in conjunction with a 12 or 301A type tube it should be 6 ohms. If a 201A 11 type tube is used the rheostat should be 20 ohms and if the 199 or 199 tube is used it should be 30 ohms. In this circuit the 199 and equal produced less volume than the others. The 12 tube works about as well as any in this hook-up. That was the tube I used, with a 1½-volt dry cell. The set is, therefore, inexpensive to make. It costs about 15 cents a week to run.

It will be noticed (Fig. 1) that the variometer is tapped at the midpoint. In most types of variometers this is an exceedingly simple operation. You will find that there are two flexible leads emerging from the windings. These two leads, in the variometer as you bought it, are connected, thus joining the stator and rotor windings of the instrument. A wire is connected from the end of the primary coil L1 to this flexible connecting wire of the variometer. The insulation will have to be scraped off the variometer connecting wire just sufficiently

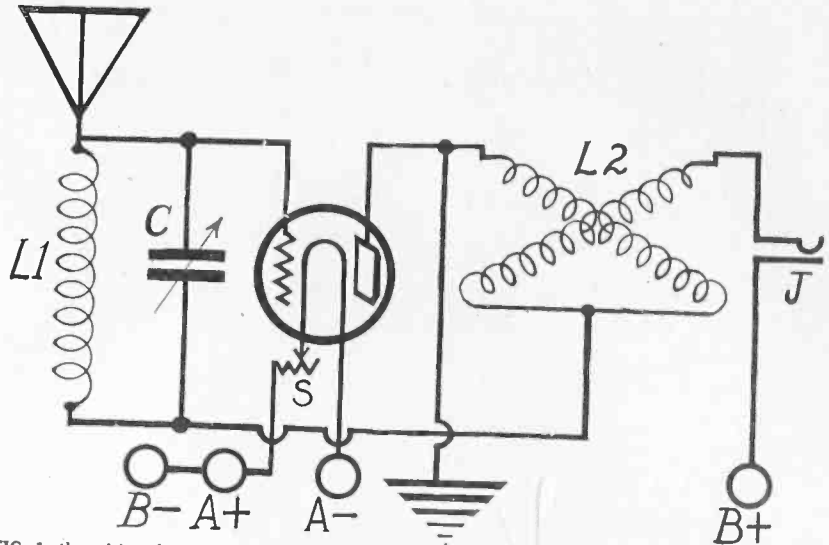


FIG. 1, the wiring diagram of Bernard's voluminous 1-tube set. Some locals were heard on a loud-speaker and all stations heard came in with terrific volume on the earphones. Mr. Bernard says that this set gives greater volume from one straight tube than any other circuit. The construction is very simple. The primary is tuned by a variable condenser and there is a variometer in the plate circuit, tapped at the midpoint.

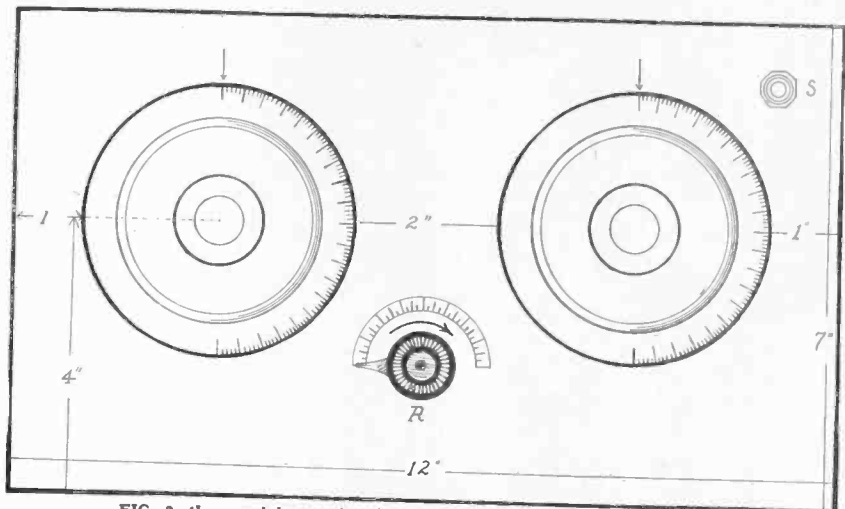


FIG. 2, the panel layout for the 1-tube set that gives terrific volume.

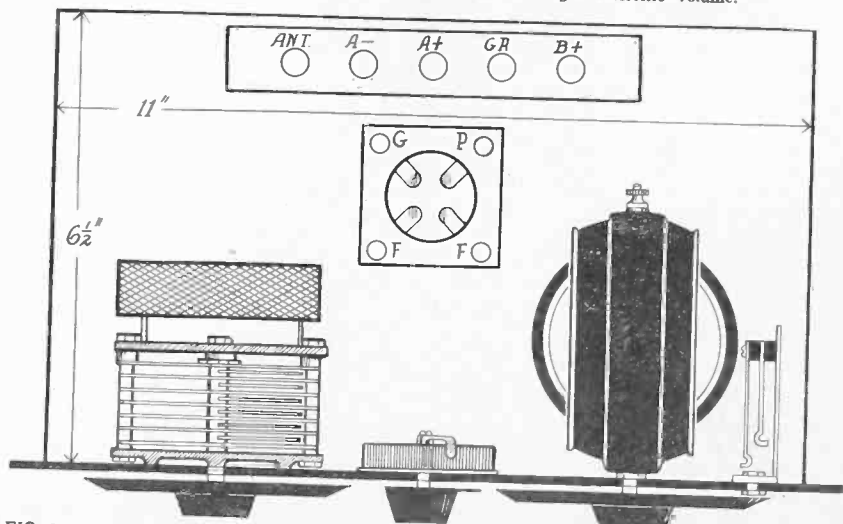


FIG. 3, assembly plan. The honeycomb or duolateral coil may be mounted on the back of the variable condenser, using bus bar, but the coil should be kept more than 1" away from the condenser, to avoid possibility of currents interplaying. The terminal strip, shown at the back of the baseboard, is marked for Antenna, A-, A+ (to which B- also is connected), Ground and B+.

to enable you to solder the lead from the primary L1.

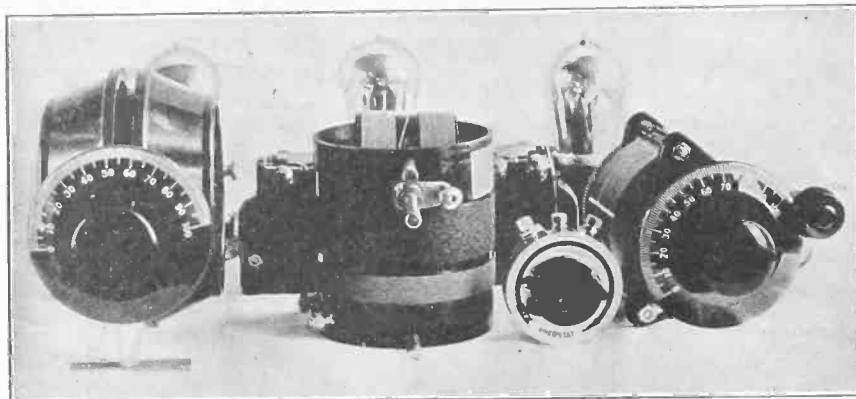
### How Circuits Are Tuned

The tuning accomplished in this circuit is

interesting. The aerial goes to the grid and the grid return is both to the plate, through the mid-point of the variometer, and to the

(Concluded on page 24)

# How to Select Parts for a Set



AT LEFT, a variometer, with insulated housing. In the center is a variocoupler, with the cylindrical rotor. This kind of rotor is preferred by the author. This instrument would be still better if the primary form were removed. At right is a mechanically fine rheostat and low-loss geared vernier variable condenser.

By *Abner J. Gelula*

ONE of the most interesting topics to the experimenter is the selection of parts and equipment for his set.

## Aerials

Aerial wire is very important. Various types of aerial wires are on the market. The solid copper and the stranded copper aerial wire, as well as the braided, are about equal, so far as increased volume and distance are concerned. However, the solid copper hasn't the tensile strength of the stranded or braided wire. But it will bring in signals just as well. Braided and stranded wire present a greater surface and may pick up the signals a little better in some cases. Braided wire that is enameled is very good, both theoretically and practically. The enamel insulation prevents the corrosion of the copper. Therefore, as to aerials, we pick the 8-strand, enameled copper wire.

## Condensers

Variable condensers are peculiar things. A condenser may be built according to low-loss principles, yet faulty insulation may make it actually high-loss.

The variable condenser has two separate sets of plates, stationary and rotary. The rotary plates vary between the stationary. It is important that the spacing between the plates should not vary. The best condensers are made of comparatively thick, small plates, rather than large thin plates. The reason for this is purely from a mechanical point of view. However, an instrument that is well made mechanically has an excellent chance of being good electrically. Many condenser plates are "polka-dotted" so as to give a greater surface for a given amount of space. This is very good practice. The less actual insulating material there is on a condenser, the better it is. Really, the only insulation necessary on a variable condenser is the two points of contact at the end-plates. The plates of the variable condenser should be made of a metal of low resistance, such as aluminum or brass. Naturally copper, having a lower resistance than either, would be better electrically; but due to the inability to temper copper it is impossible to use it. As to the variable condenser, our ideal would be one composed of aluminum or brass plates, cast aluminum ends, insulated only at point of contact by small, round pieces of approved insulating material, large shaft, with plates soldered. Theoretically, silver plates would be

best, but of course this would be financially out of the question.

Fixed condensers should have mica as an insulating material, completed under high pressure, so that the value will remain constant, regardless of temperature. Condensers with paper insulation have very high losses and are likely to be unstable.

## Inductances

In variometers and variocouplers, as well as any other inductance, there will be lower losses and more efficient operation if no form is used. I believe that there is no noticeable difference between a well-made coil of cylindrical proportions and the well-known spider-web coil. According to theory, the spider-web has a lower distributed capacity. That may be true, but practical results count. You can't receive signals on a theoretical set. Wire should be as large as possible without occasioning harmful eddy currents. No. 18 usually is not too large. The resistance lowers with the increase in size of the wire, which should be enameled and double silk covered.

If a rotary coil is necessary, a well-seasoned, unpregnated form will cause no appreciable change in results. It should be wound carefully and with a fairly large wire. I have found that the straight cylindrical rotor tunes more sharply than rotors which are formed. However, this should be a secondary consideration. Do not apply anything to the winding to keep it in place. A well-made coil does not require it and it tends to increase distributed capacity, which means another outlet for the minute energy contained in the coil.

## Resistances

In resistance units, such as rheostats and potentiometers, it is best that the sliding arm press firmly, yet turn easily on the resistance proper. It should be wound so that it presents a large surface for ready cooling. A very good type of rheostat operates by variable pressure upon a column of graphite disks. This enables extremely fine regulation.

## Sockets

The importance of the socket is too often under-estimated. It is important that just as much attention be paid to the socket as to the coil, for it is in the socket that many weak impulses that have passed through the coils are lost. The socket should be made similar to the condenser, in that insulation should be placed only at point of contact with the shell or base of the socket. The entire instrument may be made of cast aluminum, with as much cut away as possible, so that practically only the shell is left. Prongs should be of a low-

resistance, springy metal so as to insure good contact.

## Audio Transformers

Audio-frequency transformers must give as much amplification as possible without distortion. Moreover, this amplification must remain constant and uniform over the voice and musical range of frequencies, which is about 100 to 10,000 cycles per second. Transformers must be able to respond to sudden changes of frequency and voltage. Of course, such factors may be determined only by trial. No transformer should be chosen without due consideration of its amplification curve and degree of amplification. As an average, the turns ratio should be generally about 4-to-1. It is well to have transformers of succeeding stages of different ratios. The first stage may be 6-to-1, second stage 3½-to-1. This will keep distortion at a minimum at maximum amplification. The wire of the transformer is usually anywhere from No. 40 to 44 enamelled copper.

## Phones

Phones are one of the most important instruments in the entire receiving outfit, for you hear only that to which the phones respond. When the phones are used for loud-speaking use it is best to have mica rather than metal diaphragms, for under high power the metal will rattle against the magnets, causing a chattering. The fact that one pair of phones is of a resistance of 2,000 ohms and another of 3,000 doesn't necessarily mean that the phones of higher resistance are more sensitive. The value of higher resistance in a telephone receiver is questionable. Phones and loud speakers can be gauged only by individual test.

## Radio Transformers

Radio-frequency transformers are divided into two classes, the closed and open core. The tendency is toward the use of the open or air-core type. This is used notably in the Neutrodyne, and other tuned radio-frequency amplifiers. In selecting transformers of this type the same general precautions should be observed as in the case of any inductance coil, as to winding, losses, etc. The same number of turns may be employed for each succeeding stage. The secondary of the transformer is tuned by a variable condenser.

## TELLS OF BATTERYLESS TUBES

CONRAD SCHICKERLING, of Newark, N. J., has invented a vacuum tube that he says completely eliminates both the A and B battery utilizing either alternating or direct current directly into the tube without the use of any extra apparatus. The device is really a tube within a tube, which acts as a rectifier. The connections for this tube are quite unusual. The grid returns to the A minus as usual, but the plate returns to the filament plus.

The tube is not on the market. Experiments are still being conducted.

Receivers may now be built without providing space for cumbersome storage and B batteries, thus aiding compactness and general portability.

Mr. Schickerling gives much of the credit to his daughter Hortense, who is said to be one of the most expert feminine tube constructors in the United States.

## INDEX TO VOL. 5, RADIO WORLD

A complete index covering all the articles that appeared in Radio World from Jan. 5 to Sept. 20, appeared in Radio World dated Oct. 18, mailed on receipt of 15c., or start subscription with that number. RADIO WORLD, 1493 Broadway, New York City.

# Wonders of Radio Stressed at Third National Show

**A**BOUT 100,000 persons visited the Third National Radio Exposition at Grand Central Palace, New York City. The show lasted a week and proved decidedly interesting. The achievements of radio were stressed by concrete examples, such as sending the letter S around the world in six minutes. A glimpse into the future was given by Gen. James G. Harbord, president of the Radio Corporation of America.

There were two miles of exhibits and 175 manufacturers had products on display. There was a ball on Election night and a beauty prize winner chosen. Roxy (S. A. Rothafel) got a loving cup, Governor Smith made a speech, Maj. J. Andrew White did some smooth announcing, Eddie Cantor drew laughs—RADIO WORLD booth attracted crowds—were some of the week's features.

The show was opened when Guglielmo Marconi pressed a key at Carnavon, Wales, and dispatched the signal received at the show. Another DX feature was the explosion of a photo flashlight at the show by an impulse from England. The resulting photo is a memento.

Radio and the phonograph were closely allied at the show. Many manufacturers had combination radio-phonograph cabinets on display. Every type of receiver from a crystal detector to the latest super-heterodyne built into a phonograph cabinet was on exhibit.

There were no revolutionary or entirely new circuits, but a trip through the Grand Central Palace clearly showed the refinements made since the exposition last year. The new types of apparatus reveal that standards of design have been developed.

A transoceanic radio display consisted of a complete transmitting and receiving apparatus, including the perforator, high-speed transmitter and syphon receiver. Operators were on duty punching the tape at high speed and recording incoming messages on typewriters. It showed the contrast between receiving commercial messages and receiving music from broadcasting stations. The marine display included a continuous wave-sending apparatus, a spark set with tube attachment and a radio compass or direction finder.

Various types of current-supply devices, designed to replace A and B batteries were interesting, if the crowds around the booths could be taken as an indication. The instruments can be attached to the light socket and permit use of the house lighting current in place of batteries.

The De Forest exhibit contained an oscillograph, by which broadcast listeners visualized the Hertzian waves. The visualization of the individual vibrations or waves resembled moonlight on the water. The demonstrating device spread out the vibrations on a ground glass screen so that they could be seen just as if they were stopped in their motion. The changing patterns of the voice waves, which determine the character and quality of the transmitted sound, were clearly noticeable.

There were many different types of A and B batteries at the exposition. The displays indicated that manufacturers have directed their attention during the



JUDGING FROM THE GREAT CROWDS WHICH VISITED RADIO WORLD'S BOOTH, IT WAS ONE OF THE MOST POPULAR AT THE EXPOSITION.

JOHN F. GRINAN WHO IN 1917 SENT THE FIRST MESSAGE ACROSS THE CONTINENT SENT THE LETTER 'S' AROUND THE WORLD AT THE EXPOSITION.

MISS MARGIE BOOTH WAS CHOSEN THE MOST BEAUTIFUL GIRL FROM 1,000 CONTESTANTS

MAJOR J. ANDREW WHITE WAS VERY MUCH IN THE EVIDENCE EACH NIGHT.

HAROLD BOLSTER, MANAGER OF THE BIG SHOW

S. A. ROTHAFEL, "ROXIE" WHO ENTERTAINED.

EDDIE CANTOR HAD THE AUDIENCE ALWAYS LAUGHING.

MAJOR ARM STRONG WAS THERE UNOFFICIALLY.

GOVERNOR AL SMITH SPOKE AT GREAT WAVE LENGTHS.

past year to the development of wet B batteries to meet the demand of multi-tube sets, which consume considerable battery current. Battery power plans illustrated how to charge A and B storage batteries.

A new type of vacuum tube detector and amplifier was introduced. It is called the "True Blue Tube," because the glass is colored cobalt blue to distinguish the tube from all others now on the market. The prongs are tipped with silver to prevent corrosion and poor contact when the tube is placed in the standard socket. The base is mahogany bakelite. The tubes are non-microphonic, in that they will not produce a ringing sound when mechanical vibrations jar the set. The filament operates on three to six volts giving maximum volume when the six volts are used. The B battery requirements vary from 40 to 150 volts. Variable condensers have been much

improved in regard to strength of mechanical construction, precision of adjustment and low loss in efficiency.

Gen. Harbord said in his speech:

"It is not too much to say that we are on the eve of developments whereby it will be within the realm of possibility to transmit a complete newspaper page from London to New York by means of radio and in a fraction of the time it would take to transmit the entire text of the page either by radio or cable telegraph signals."

General Harbord then gave a summary of the developments which may be expected in the art of radio.

"Transoceanic broadcasting—in short, the realization of international broadcasting," he said, "for purposes of entertainment is not yet in regular operation, but proposals for increasing the power of sending stations so that pro-

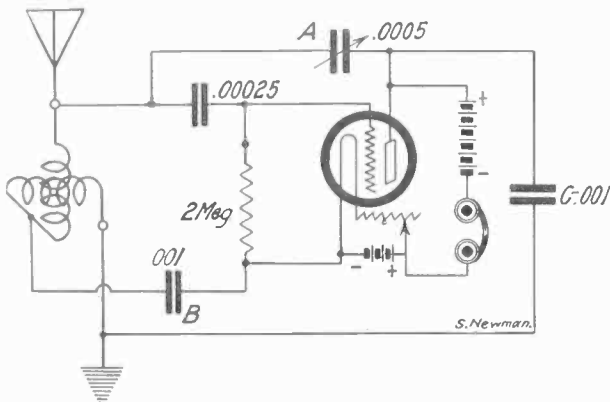
(Concluded on page 21)

# A Sensitive 1-Tube Circuit with Phones Across Batteries

## The Radio University

A Question and Answer Department conducted by RADIO WORLD for its Readers by its Staff of Experts. Address Letters to Radio University Department, RADIO WORLD, 1493 Broadway, New York City.

**CAN YOU PLEASE** tell me if it is all right to connect the negative side of the B battery to the phones? Kindly print a circuit that will regenerate using one coil—Ambrose Powers, 506 N. Western Ave., Nevers, Neb.  
The circuit is shown in Fig. 51.



A VERY sensitive and fairly selective circuit may be built around a variometer. Standard parts are used throughout. The variable condenser .0005 mfd. has 23 plates (Fig. 51).

**CAN you give me** the circuit of the Tuska Superdyne? (2) Should the volume of the Superdyne equal that of the Neutrodyne? (3) If not, what would you suggest to increase it? (4) Should there be an overlapping of local stations when they are 25 meters apart? (5) Why won't a VT1 tube work as detector?—S. P. Scantlin, 709 Fisher Bldg., Chicago, Ill.  
(1) The Tuska Company is not giving out the circuit. (2) The Superdyne volume compares very well with that of the 5-tube Neutrodyne. (3) Add a stage of resistance-coupled audio, if you wish. (4) That is hard to say. Many of the stations operating on a certain stated wavelength are tuned so broadly that they take up more than their share of the air. It is not the fault of the set at least half the time. (5) The VT1 is a "hard" tube, i. e., it is exhausted to a very high degree, therefore acts better as an amplifier.

**I CANNOT** get any stations any higher than 380 meters. Can you tell me how to get higher? I've used as much as a 100-turn coil without raising the wave a bit. (2) I used a tapped coupler. Is my aerial tuned or untuned?—Chas. L. Porter, Norton, Va.

Place a 43-plate condenser across the primary. Lengthen the aerial to 125 to 150 feet. (2) Tuned.

**WHAT** would my wavelength range be with an Atwater-Kent coupler in connection with a 100-foot aerial?—R. D. Oldham, Croft, Kan.  
Approximately 235 to 600 meters.

**IN THE ISSUE** of Oct. 11 there appears a radio-frequency circuit by N. N. Bernstein. He shows a coil of 60 turns tuned by a 17-plate condenser. I always thought that a radio-frequency coil had to have a primary and secondary. Is the circuit as published O. K.?—M. A. Richardson, Conklingville, N. Y.  
The circuit as published is all right. Radio-frequency transformers may consist of a single coil yet be transformers. The two-coil transformer operates through induction, while the one coil

theoretically induces itself. The single coil is known as the impedance type. It causes more volume but less selectivity than the others.

**DO** storage A and B batteries give off fumes that are injurious to draperies or fabrics in the room with them?—A. L. Clarke, 132 Pearl St., Little Rock, Ark.

No. When charging the battery does give off fumes of hydrogen, but they are not injurious.

**IS** the Sleeper Monotrol 54 as good as is claimed? What is there to the Sidelen Hetro Magnetic and the Freshman Masterpiece?—J. S. Morrison, Odell, Texas.

(1) Yes. (2) Both are excellent tuned RF circuits.

**I RECEIVE** WTAS (275 meters) on 11 on the dial; KSD (546 meters) at 93 on the dial. Can you tell me how to rewind the coils to conform with the new wave-bands? I have an aperiodic primary and a 60-turn plate coil.—C. J. Loomis, 341 Washington Ave., Pierre, S. D.

From your present coil remove 10 turns from the grid coil, 3 turns from the antenna coil. Instead of the plate coil being 60 turns, it will have to be 50. The .00025 variable condenser in shunt with the grid coil should be 23 plates.

**I HAVE** a Paragon 3-tube regenerative set. I get locals fine, but I find it practically impossible to get distance. I have an aerial 65 feet long including lead-in. Another person has the same type of set and operating under practically the same conditions gets wonderful distance. Can you help me?—Chas. W. Press, 1008 Summit Ave., Jersey City, N. J.

You do not know how to tune your set. Also, your aerial should be longer. It should be approximately 150 feet including lead-in. In tuning, the grid variometer is the main tuning instrument. The plate variometer controls the selectivity and sensitivity of the set, while the coupler and taps act as vernier and wavelength-jumps, respectively.

When you hear a station, regardless of how weak, regeneration must be brought into play by carefully tuning the plate variometer until it is just below the oscillating point. This may be recognized by a low "rushing" sound in the phones. The taps are very important and should be cut in one or two points away, compensating the grid variometer, as well as on the plate variometer. It is necessary that an elementary understanding of operation theory be had for the proper operation of a set of this type.

**WE HAVE** an 8-tube Ultradyne using indoor aerial. Our neighbor (possibly 30 feet away) has a 3-tube set, outdoor aerial. We have noticed that when he charges his battery we have terrific noises. Can you tell us how this may be eliminated?—Rufus A. Church, 17 Roosevelt Ave., Warren, Ohio.

No doubt your neighbor charges his battery while hooked up to his set. If he will disconnect the battery from the set while he charges it we doubt that you will receive any noises from this source. Your aeriels may be parallel. Better reception will be had all around if you could arrange to have the aeriels at a 45 to 90 degree angle in respect to each other.

**IN REFERENCE** to the Superflex circuit, do you consider it a good reflex circuit?—Francis M. Cole, 526 Sangamon Ave., Rantoul, Ill.  
We do not recognize the circuit by that name. Please send the diagram and we will answer you.

**IN THE** "4-tube RF receiver" by Byrt C. Caldwell, can I use type 11 tubes?—Ralph A. Bennett, 1515 Burton St., Rockford, Ill.  
Yes, but type 201A tubes will be better.

**CAN you tell me** how to build a good loop for the Acmedyne?—H. C. Moore, 602 Park Ave., Hoboken, N. J.  
See the issue of July 19 RADIO WORLD.

**IN REFERENCE** to the 2-tube reflex by Byrt C. Caldwell in the issue of Oct. 11: (1) Are both RF coils wound in the same direction? (2) Will an R. C. A. 1714 RFT be better in this circuit? (3) What terminals on the primary of the AFT are connected to the secondary on the RFT? (4) Will two Acme AFT, 4½-to-1 ratio, work as well as a 6-to-1 and 3½-to-1? Will 199 tubes give excellent results? (5) Will this set be selective within 3 miles of WCAP or WRC?—Geo. W. Lyon, 4200 Chesapeake St., N. W., Washington, D. C.

(1) Yes. (2) No. (3) P on RFT to crystal, other side of crystal to F of AFT. B+ of RFT to G of AFT. (4) No. (5) This set is not selective enough for you.

**WHAT** can I do to cut down the wavelength of my set? I reach 535 meters, but cannot get any lower than 265 meters.—Fred H. Butters, 133 Griggs St., Waterbury, Conn.

Place a 43-plate variable condenser in series with the ground lead. If you have a secondary condenser in circuit, see that all the plates are out when you desire to lower the wavelength of the set. Leave the ground condenser plates half way out always. It is not necessary to tune with this condenser until you desire to go on lower waves.

**I HAVE** a single-circuit regenerative set with two stages of audio amplification. Will a third stage of resistance-coupled amplification increase the volume to any great extent, or would transformer AF be better? Please give ratio or resistance of the type you think best.—W. J. Hubler, 535 Aransas Ave., San Antonio, Tex.

For volume, to a very high degree, you may use the third stage of transformer-coupled amplification, but you will get distortion. Resistance AF would be better in the third stage. Use a 100,000-ohm resistance for resistance-coupling.

**CAN YOU** please send me a blue-print of the 2-tube Reflex in the issue of Oct. 25?—H. F. Yanornik, 6661 Mack Ave., Detroit, Mich.  
We have no blue-prints of that circuit.

**I INTEND** building the 4-tube Super-Heterodyne as explained by B. J. Bongart in the issue of June 28 RADIO WORLD. I do not figure out the oscillator circuit. I intend building this set for permanent use, if you so advise, placing it in a fine walnut cabinet.—Jas. N. Neville, Blenheim, Ont.

This is an experimental set and not for permanent use. Build the 4-tube Superdyne, by J. E. Anderson.

**I BUILT** the 1-tube Superdyne as described by Herman Bernard in the Nov. 15 issue of RADIO WORLD. I live two miles from two powerful broadcasting stations and the set does not tune them out. What can I do? Tone quality of what I do get is wonderful.—J. Englander, 16 West 8th St., New York City.

The author stated in his article that the set was not selective enough for exceptional cases like yours and advised that nobody living within four

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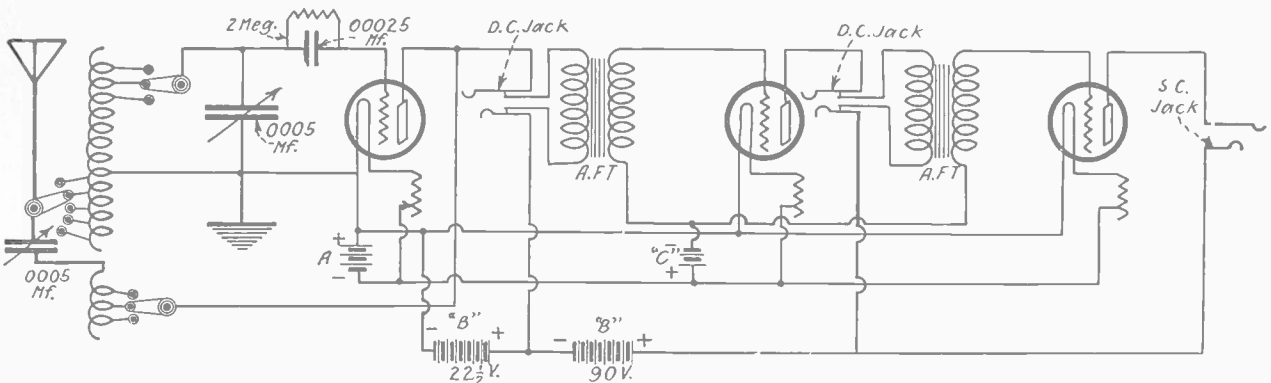
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# Reinartz Hookup, Followed by Two Stages of Audio



**THE REINARTZ.** Care in the construction of this set is required if maximum efficiency is to be attained. Under capable hands this set will produce marvelous results. The grid return tap is taken off at the 25th turn, the entire secondary being shunted by a 23-plate variable condenser. (Fig. 53).

or five miles of two stations of 500 watts or more should build the set. You may use a tunable radio-frequency transformer, instead of the fixed type, in the crystal side of the circuit for greater selectivity, but undoubtedly you will not be able to tune out those two close stations.

**CAN YOU** give the Reinartz circuit with two audio stages?—Arthur Copeland, 57 W. 75th St., New York City.

On a spider web form, wind 45 turns of No. 20 D.C.C. wire thus: The first 15 turns tapped every fifth turn. Wind untapped until the 25th turn, after which the coil is tapped every fifth turn through to the 45th turn. On the same form the plate coil is wound, 25 turns, tapped every fifth turn after winding for 10 turns untapped. The circuit is shown in Fig. 53.

**I LIVE** 150 miles from the nearest broadcasting station. Kindly give me a 3-tube circuit, as simple as possible, but fairly sensitive. I don't believe that I will be troubled with interference.—Ethel Epstein, San Juno, Neb.

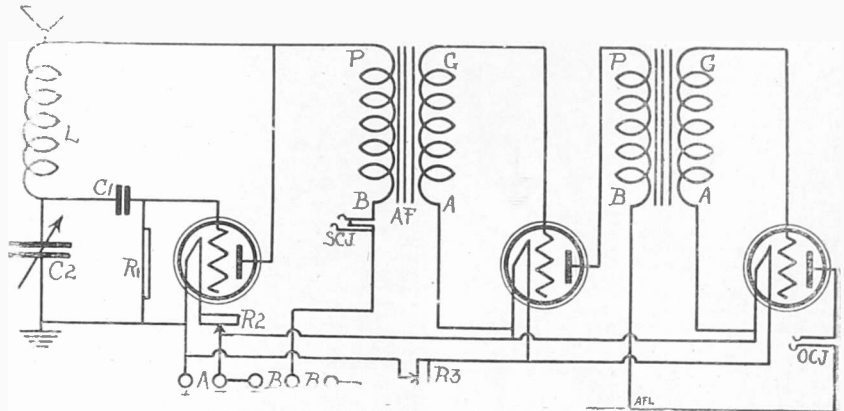
The circuit you request is Fig. 52. L is a 75-turn honeycomb coil.

**WHISTLES** are heard in the phones of the 1-tube Bernard Superdye, issue of Nov. 15, when I get a station's wave. What is the cause and remedy?—Al Michel, 654 Beck St., New York City.

You have made connections the wrong way, else L1 and L2 are too tightly coupled. The top of the primary coil (L1) should go to the ground and the bottom to the aerial. This is unusual and you may have been misled, although the connections were plainly diagramed on the first page of the article. However, proceed in this order: First reverse the connections to the coupled feedback coil L2. If the whistling does not stop, then replace those connections as they were and reverse the connections of the single coil L3 in the plate circuit. If that doesn't remedy your trouble, replace these connections as they were, and reverse the connections in the aerial circuit. If whistles still continue to accompany the tuning in of a station, widen the space between the aerial and feedback coils L1L2. If your connections are made according to the author's instructions and the spacing is wide enough the whistles will not be present when you tune. They are caused by over-regeneration.

**INSTEAD** of using a cylinder in the Bernard 1-tube Superdye, can I use duolateral coils for L1L2 so as to take up less room or the aerial-feedback combination? I have made the set as described by the author and it works wonderfully well. I never heard so much volume from a stage of RF ahead of a crystal detector and the quality of the received signal is indeed "something to rave about." But my baseboard is crowded for room.—R. Malvia, 233 West 76th St., New York City.

If your set is working so well it is scarcely a good move to make any change just for conservation of space, for if you follow the author's assembly plan you will have enough room. However, if you must use a duolateral or honeycomb primary and feedback coil, mount a 5 x 1" strip of hard rubber on the back of the variable condenser C1, using bus bar or brass angles, a 50-



**A SIMPLE** but fairly selective 1-dial circuit. Volume is great and control of wavelength is very simple. C1 is a .00025 mfd. condenser (15 plates); C2 is a 17-plate variable condenser (Fig. 52).

turn honeycomb and a 35-turn honeycomb first being slid onto the strip. Use the 50-turn coil for L1 and the other for L2, varying the coupling until the set operates without whistles. Once that point is reached, secure the two coils to their positions with tie-strings.

**IF I CUT** down the wavelength of my set I get greater selectivity, but less volume. Can you tell me how to keep the wavelength more stable? I use the Haynes circuit.—Gerold Lefkowitz, 8202 Wade Park Ave., Cleveland, Ohio.

Take off about ten turns from the grid coil, and place a 13-plate variable condenser across the plate coil.

**IN THE ISSUE** of Aug. 23 RADIO WORLD, in the directions for wiring the 2-tube Inverse Duplex, you fail to state what should be done with the G posts of the AFT, also one B post?—Wm. Keck, Corpus Christi, Tex.

The G posts go to the grid of the following tubes: The B post of the first stage of AF goes to the detector B battery, the second stage to the high voltage B battery.

**IS IT** possible, by changing the size of the honeycomb coils, to get wavelengths from 50 to 1,500 meters?—F. A. Seaman, 370 7th Ave., New York City.

Honeycombs, as manufactured, will not go lower than 175 meters, as an average. However, you may use the honeycomb mounting, winding your own set of coils for these short waves: 8 turns for primary, 12 turns for secondary and 10 turns for tickler. Use a 43-plate variable condenser in the aerial. These coils work very efficiently on waves of 1,500 meters by a mere change of coils.

**I HAVE** a 5-tube Atwater-Kent receiving outfit, fully charged A battery, new B batteries and all new tubes. The greatest distance that I have

received thus far has been WOR, Newark. Can you possibly suggest a remedy?—Michael Morales, 334 1st Ave., New York City.

Maybe a bad tube or poor aerial.

**I CAN'T GET** a sound on the split-variometer set by Neal Fitzalan—not even the hum of the B batteries. Can I buy a ready-split variometer?—J. E. Armstrong, 228 N. Delaware Ave., Philadelphia.

Your variometer is not split correctly. The rotor is not completely insulated from the stator. We would advise that you have some experienced radio man, or any radio store, split it for you, or rather, ascertain that it is split correctly. You must determine for yourself whether or not a grid condenser is necessary. Every tube has different requirements. If you haven't the polarity of your batteries correct, it is natural that you don't get a sound.

## THE DADDY OF THEM ALL!

Great DX, Wonderful Volume, Beautiful Signals!

A very inexpensive circuit, based on the Radiola III.

"A DANDY 1-TUBE DX SET"

By Herbert E. Hayden

In Radio World, issue of October 4. Send 15 cents or start your subscription with that number.

RADIO WORLD, 1493 Broadway  
New York City

**THE OFFICIAL LIST OF STATIONS**, revised and corrected up to the minute, will be published in RADIO WORLD next week, issue of November 29, on sale Wednesday, November 26. The last list was published October 18.

# BROADCAST PROGRAMS

The time given in programs is Eastern, Central, Mountain or Pacific, depending on the station's location.

## Wednesday, November 19

**KYW, Chicago, 536 (C. S. T.)**—6:30 A. M., calisthenics; 9:30, news of financial and commercial markets; 11:35, table talk by Mrs. Anna J. Peterson; 6:18 P. M., news, financial and final markets; 6:35, children's bedtime story by Walter Wilson; 7, Joska DeBabary's orch. 7:10, Coon-Sanders Nighthawks; 7:20, Joska DeBabary's orch. 7:30, program from KYW's studio; 8, Ann Kelly, soprano; George D. Horne, baritone; Harold O'Brien, violinist; The Four Legionnaires (Male Quartette); 8:30, stage review; 8:45, musical program continued; 9:45, midnight revue; W. Remington Welch at the organ.

**WGY, Schenectady, N. Y., 380 (E. S. T.)**—11:55 A. M., time; 12:30 P. M., stock report; 12:40, produce report; 12:45, weather; 6, produce and stock market; news; 6:30, "Adventure Story."

**KDKA, E. Pittsburgh, 326 (E. S. T.)**—7:30 A. M., calisthenics; 9:45, stock market reports; 11:55, time; 12, weather; stock market reports; 12:15 P. M., Daugherty's Orch. 3:30, quotations on hay, grain and feed; 6:30, Pittsburgh A. A. Orch.; Gregorio Scalzo, conductor; 7:15, storytime; 7:30, news; 8, feature; 8:15, "Evolution and Heredity"; "General Evolution," Prof. H. D. Fish; 8:30, Airbrake Electric Quartet, John C. Richard and W. B. Harvey, tenors; P. C. Brooks and J. Ren Love, basses; Mrs. W. B. Harvey, accompanist and Mrs. Jessie R. Yarnall, reader; 9:55, time; weather.

**KSD, St. Louis, 546 (C. S. T.)**—6:45 P. M., Abergh's Concert Ensemble; Arne Arnesen, violinist; 9, program to be announced.

**WEAF, New York City, 492 (E. S. T.)**—11 A. M., mothers' program; talk on Child Training from Columbia University; 12, chapel services from Columbia University; 4 P. M., musical program; 6, dinner music from Hotel Waldorf-Astoria; synagogue services; U. S. Army Band; mixed quartette; Waldorf-Astoria Orch.; Joseph Knecht, director; Charles Magnante, accordion; talk by Bishop Thomas Frank Gailor; dance program by Nicholas Orlando and his orch.; Green Brothers, xylophonists.

**WOO, Philadelphia, 509 (E. S. T.)**—11 A. M., organ; 11:30, weather; 11:55, time; 12, Tea Room Orch. 5:10 P. M., sports results and police reports; 5:15, organ and trumpets; 7:30, sports results and police reports; A. Candelori and Hotel Adelphia Orch. 8:15, J. W. C. I. Band, Arthur A. Rosander, director; 8:45, address, "The Story of the Oyster," Joseph Fowler; 9, WOO Orch.; Robert E. Golden, director; Blanche Brook-Haley, soprano; Hans Schlegel, flutist; Oscar R. Meyer, accompanist; 9:55, time; 10:02, weather; 10:03, organ, Mary E. Vogt.

**WQJ, Chicago, 448 (C. S. T.)**—11 A. M., Mrs. W. E. Fribley, "What Is the Proper Proportion for Recreation and Education?"; Harvey E. Larson, "Care of Flowers and Flower Vogue"; Leona A. Krag, "Parliamentary Law." 3 P. M., Helen Harrington Downing, "A Rice-A-Fuel for the Body"; Martha Logan, "An Old Fashioned Feast in a New Fashioned Way"; Julia Bottomley, talk on styles; 7, Williams and Rainbo Garden Orch.; Lancaster Smith, basso; Mrs. Lancaster Smith, accompanist; Maxine Mordy, violinist; 10, Williams and Rainbo Skylarks; Sandy Meek, Scotch tenor; the Melodians, Laurie, Eddie and Bennie; Clarence Theders, tenor; Rita McFawn, soprano; other artists to be announced.

**WOC, Davenport, Ia., 484 (C. S. T.)**—10 A. M., market quotations; 10:05, household hints; 10:55, time; 11, weather and river forecast; 11:05, market quotations; 12, chimes concert; 12:15 P. M., weather; 2, stocks and markets; 6:45, sport news, weather; 7, sandman's visit; 8, musical program.

**WJY, New York City, 405 (E. S. T.)**—10 A. M., Housewives Menu, Mrs. Julian Heath; 10:20, "Measles and Pneumonia," 10:30, Garden Planting, by Edith Loring Fullerton; 10:40, "Be Your Own Decorator," by Amy Mali Hicks; 10:50, Eleanor Gunns fashion talk; 1 P. M., Hubert Belmont Music; 4, Dorothy Biese, soprano; Hubert Hendrie, baritone; 4:30, Hotel Belmont Tea Music; 5:30, State and Federal agricultural reports; farm and home reports; New York Stock Exchange; foreign exchange; News; 7, Hotel Commodore Orch.; Bernhard Levitow, director; 8, Wall Street Journal review; 8:10, N. Y. U. Air College; "Geology," Prof. J. Edmund Woodman; 8:30, Marguerite Warncke, contralto; 9, Gordon Grant, "Old Ships," 9:15, Miriam Hoffman, violinist; Phillip Svigals, accompanist; 9:30, "Modern Tree Surgery," Francis A. Bartlet; 9:45, The Radio Franks; Wright and Bessinger; 10, "Philosophy of Nutrition," Alfred W. McCann; 10:30, Billy Wynne's Greenwich Village Inn Orch.

**KFI, Los Angeles, 469 (P. S. T.)**—5 P. M., news; 5:30, news; 6:45, Nick Harris Detective Stories & Orch.; 7:30, vocal recital; 8, program from Herald Studio; 9, program from Examiner Studio; 10, special dramatic program; 11, Ambassador Hotel Coconut Grove Orch.

**WRC, Washington, 469 (E. S. T.)**—3 P. M., women's wear; 3:10, song recital; 3:25, report of National Conference Board; 3:30, song recital; 3:45, piano recital; 3:50, sports for women; 4, song recital; 6, stories for children.

**WIP, Philadelphia, 509 (E. S. T.)**—1 P. M., Gim-

bel Tea Room Orch.; Ray Steen, director; 1:30, weather; 3, artists from the School of Music of Temple University; 6, weather; 6:05, Art Coogan and Club Madrid Orch.; 6:45, Department of Agriculture, livestock and produce market; 7, Uncle Wip's bedtime stories.

**KHJ, Los Angeles, 395 (P. S. T.)**—12:30 P. M., program presenting Abe Perluss and his Rose Room Orchestra playing through the courtesy of the Rose Room, William Leder, manager; Fred C. McNabb of Aggeler & Musser Seed Company; 2:30, matinee musicale; 6, Art Hickman's Concert Orchestra from the Biltmore Hotel, Edward Fitzpatrick, director; 6:30, program presenting Prof. Walter Sylvester Hertzog telling stories of American history; Dick Winslow, screen juvenile and yodeler; Baby Muriel MacCormac, screen juvenile; Billy Jane Webb, 12-year-old singer and yodeler; bedtime story by Uncle John; 8, Dr. Mars Baumgardt, lecturer; program presented through the courtesy of the Pacific Mutual Life Insurance Company, arranged by E. S. Nelson; 10, Art Hickman's dance orchestra from the Biltmore Hotel, Earl Burnett, director.

**WGBS, New York City, 316 (E. S. T.)**—10 A. M., "Timely Talks with Terese." 10:10, Christine Thompson, pianist; 10:20, Anna Barrows, on "Your Thanksgiving Dinner." 10:30, Christine Thompson, pianist; 10:40, Gertrude Tucker, in book review; 10:50, Christine Thompson, pianist; 1:30 P. M., J. B. Caronia and His Pirates Den Quartet; 3, interview by Terese Rose Nagel with "Tony Sarg." 3:10, Adele Abrams, soprano; 3:20, Inez Haynes Irwin; 3:30, Adele Abrams, soprano; 3:40, J. W. Faust, Playground and Recreation Association of America, "Home Play." 3:50, Adele Abrams, soprano; 6, Uncle Geebee; 6:25, Elsie Jean, Children's stories; 6:35, Abner J. Gelula, of Radio World, "Radio Technicalities." 6:45, Fred Ruzicka, violin; accompanist, Teresa Lefkowitz; 7, Uncle Robert, talking to the family; 7:15, violin.

**WHN, New York City, 360 (E. S. T.)**—6:30 P. M., Vincent Cananese's Alamac orch. 7, Harry Richman and his tententainers; 7:30, chat with Emily; 7:40, Cantor B. Steinberg, songs; 7:50, Rabbi Jos. H. Lookstein, talk, "Preventing Religion." 8, Yorkville radio trio; 8:30, Arnold F. Ferrotta, baritone; 8:45, T. Clifford, tenor; 9, Quinn piano trio; 9:30, news; 9:37, Rose-Dance-land orch.; 10:07, Clover Gardens dance orch.

**WOR, Newark, N. J., 495 (E. S. T.)**—7 A. M., gym class, Arthur E. Bagley, director; 2:30 P. M., Sonoma Talley, pianist, and Lillian J. Gwynne, soprano; 3, "The Origin of Silk," by Albert N. Lincoln; 3:15, pianist and soprano; 3:45, Leon Moses, Ph.D., on "Message of Wagner—The Rhinegold." 6:15, Howard Oliver's Famous Log Cabin orch.; 6:50, resume of sports by "Jolly Bill" Steinke; 8, Gene Ingraham's orch.; 8:30, musical program direction of Harold Flammer; 8:40, Walter Mills, baritone, and Harriet Ware, composer and pianist; 8:50, Ernesto Berumen, pianist; 9, Karolyn Wells Bassett, composer, pianist and soprano; 9:10, Elizabeth Thorn Boutelle, composer, pianist, and Grace Devine, soprano; 9:15, Dr. Frank H. Vizetelly, "Slangue and Slovenly Speech." 9:30, musical program; 10:30, "Isle of Sunshine"—a musical comedy by Jim Fitzhain.

## Thursday, November 20

**KYW, Chicago, 536 (E. S. T.)**—6:30 A. M., calisthenics; also at 7 and 8; 9:30, news and comment of the financial and commercial markets; 10:30, farm and home service; 11:35, table talk by Mrs. Anna J. Peterson; 2:35 P. M., "Afternoon Frolic"; 6:02, news, financial, and final markets; 6:35, children's bedtime story; 7, Joska DeBabary's orch.; 7:10, Coon-Sanders Nighthawks; 7:20, Joska DeBabary's orch.; 8, "Twenty Minutes of Good Reading," by Rev. C. J. Pernin, S. J.; 8:20, artists and program announced; 9:20, "Safety First" by Mr. Z. C. Elkin; 10, "At Home"; Coon-Sanders Nighthawks.

**KDKA, E. Pittsburgh, 326 (E. S. T.)**—9:45 A. M., stock market reports; general market review and agricultural items; 11:55, time; 12, weather; stock market reports; 12:15 P. M., concert by Scalzo's Orch. 3:30, quotations on hay, grain and feed from the Stockman Studio; 6:30, KDKA Little Symphony Orch., Victor Saudek, conductor; 7:15, Uncle Ed; 7:30, address by a representative of the Pittsburgh Automobile Club; 7:40, stockman reports; 8, program by National Stockman and Farmer; 8:30, KDKA Little Symphony Orch.; direction of Victor Saudek; 9:55, time; weather; 11, Pittsburgh Post Studio.

**KSD, St. Louis, 546 (C. S. T.)**—4 P. M., The Home Hour.

**WEAF, New York City, 492 (E. S. T.)**—11 A. M., talks to housewives' musical program; 4 P. M., musical program; lecture direct from Columbia University; 6, Hotel Waldorf-Astoria Orch.; services New York Federation of Churches; Melo Club Dance Orch.; talk by Bank of America; "Touring"; Hohner Harmony Hour; Marjorie Candee, soprano; Mary Lackland, violinist; The Three Peasants; Milton Rettenberg and Edgar Russell, piano duets; Vincent Lopez and His Orch.

**WOO, Philadelphia, 509 (E. S. T.)**—11 A. M., organ; 11:30, weather; 11:55, time; 12, Tea Room Orch. 5:10 P. M., sports results and police reports; 5:15, organ and trumpets; 9:55, time; 10:02, weather.

**WQJ, Chicago, 448 (C. S. T.)**—11 A. M., Miss Erna Bertrams, "Tempting Thanksgiving Pies." Miss Eleanor Chalmers, "Advice to Home Sewers." 3 P. M., Cora Beeman, "Planning Thanksgiving Menus and Marketing List"; Agnes May Allen, Dietitian, "Some Unusual Thanksgiving Suggestions"; Charles T. Wolf, "Colors." 7, Williams and Rainbo Garden Orch.; Sheppard Levine, tenor; Kathryn Snyder, reader; Manual Rodriguez, Spanish tenor; Mrs. Lydia Lochner, contralto; Marion Henry, accompanist; 10, Williams

and Rainbo Skylarks; Axel Christensen, pianologues; Hill, Hirsch and Gorny, Harmony Singers; Rosemary Hughes, soprano; Ed Bandell, contralto; Grace Wilson, contralto; Edna Solomon, soprano; Will Rossiter, "The Daddy of Them All"; Fred Hughes and Bill Axman, record artists.

**CKAC, Montreal, 425 (E. S. T.)**—4 P. M., weather and stock reports; 8:30, Canadian National Railways concert.

**WOC, Davenport, Ia., 484 (E. S. T.)**—10 A. M., market quotations; 10:05, household hints; 10:55, time; 11, weather and river forecast; 11:05, market quotations; 11:10, agricultural bulletins; 12, chimes concert; 12:15 P. M., weather; 2, closing stocks and markets; weekly report of wool market; 6:45, sport news and weather; 7, sandman's visit; 9, orch. program; Ralph W. Fuller, baritone soloist.

**WJY, New York City, 405 (E. S. T.)**—7:30 P. M., Berlitz French lesson; 8, Mildred Emerson, soprano; 8:15, Time Pop Question game; 8:30, Wanamaker organ recital; 9:30, Outlook literary talk; 9:45, "Illiteracy Day," Prof. Geo. E. Payne, American Education Week; 10, Al Reiser's Corinthians.

**WDAR, Philadelphia, 395 (E. S. T.)**—11:45 A. M., almanac; 12:02 P. M., organ; features; Arcadia Concert Orch.; Feri Sarkozy, director; 2, Arcadia Orch.; artist recital; 4:30, artist recital; 5, question period in the educational talks; 5:45, sporting results and special announcements; 7:30, Dream Daddy.

**WJZ, New York City, 455 (E. S. T.)**—10 A. M., Housewives Menu, Mrs. Julian Heath; 10:20, The Progress of the World; 10:30, Household Equipment; Ethel R. Peyser; 10:40, Dress Embroideries, by Editor of Needle Art; 10:50, Eleanor Gunn's fashion talk; 1 P. M., Nathan Abas' Hotel Pennsylvania Orch.; 4, Madam Gisela Amati, soprano; 4:15, Albert R. Eache, tenor; 4:30, Bernhard Levitow's Hotel Commodore Tea Music; 5:30, State and Federal agricultural reports; farm and home reports; New York Stock Exchange; foreign exchange; News; 7, Bernhard Levitow's Hotel Commodore Orchestra; 7:55, Collier's Weekly, John B. Kennedy; 8, Wall Street Journal review; 8:10, N. Y. U. Air College; "Geology," Prof. J. Edmund Woodman; 8:30, George I. Everett, baritone; Everett Harris, pianist; 9, "Golden Rule Dinner" of Near East Relief from Waldorf-Astoria; addresses by Secretary of State Chas. E. Hughes, Chief Justice Wm. H. Taft, Senator Elihu Root, Cleveland H. Dodge, Henry Morgenthau; 10:30, Waldorf-Astoria Dance Orch.

**KFI, Los Angeles, 469 (P. S. T.)**—5 P. M., Herald news; 5:30, Examiner news; 6:45, Y. M. C. A. lecture; 7, Don's Melody Makers; 8, Hotel Ambassador Concert Orch.; 9, program from Examiner Studio; 10, light opera program; Eileen Hutton, lyric soprano; Wilfrid Cushing, baritone; others.

**WGBS, New York City, 316 (E. S. T.)**—10 A. M., timely talks with Terese; 10:10, Estelle Llebbling program; 10:20, Ruth Mason Rice, "Is your home attractive?"; 10:30, Estelle Liebling program; 10:40, Humorous Household readings, by Hattie Morse Hamburger; 10:50, Estelle Liebling program; 1:30 P. M., Bob Schafer, composer and singer; Mrs. Bob Schafer, soprano; Peter de Rose, pianist; Harry Olson, banjo solo; 3, interview by Terese Rose Nagel with Louis John Bartels, of "The Show Off." 3:10, Nanette Marchand Stevenson, soprano; 3:20, Bella N. Zilberman, "Playette." 3:30, Nanette Marchand Stevenson, soprano; 3:40, Wolff Henius, in "German Movie Stars." 3:50, Nanette Marchand Stevenson, soprano; 6, Uncle Geebee; 6:30, story telling; 6:45, Lulu Jones Downing, composer pianist; Virginia Howell, reader and singer; 8:30, Oliver Saylor, "Footlight and Lamplight" play and book reviews; 9, Jean Spitzer, violinist; Nat Sander's Hotel Hargrave Trio; Louise Vaupel, soprano; talker, Captain Bartlett, Polar explorer; 11, musical program.

**WRC, Washington, 469 (E. S. T.)**—6 P. M., children's hour; 7:30, talk on motoring; 7:45, Interstate Commerce Commission Band; 8:30, talk by Smithsonian Institute; 8:45, song recital by Florence Sindall, soprano; Thelma Smith, contralto; Horace Lake, baritone; and Floyd Williams, tenor; 9:30, concert by the Lee House Trio; 9:55, time; 10, concert by the Harmonious Quartet; 10:30, dance program.

**WIP, Philadelphia, 509 (E. S. T.)**—1 P. M., Gimbel Tea Room Orch.; Ray Steen, director; 1:30, weather; 3, "Bureau of Part Time Work," by George P. Joline; 3:15, Estella Mayer, pianist; Dorothy V. K. Anderson, soprano; Maurice Freedman, violinist; 6, weather; 6:05, Art Coogan and Club Madrid Orch.; 7, Uncle Wip's Roll Call and Birthday List; 8, Wip Magazine of the Air.

**KHJ, Los Angeles, 395 (P. S. T.)**—12:30 P. M., the Piggy Wiggy Girls; 2:30, musicale; 6, Art Hickman's Concert Orch.; 6:30, children's program; 7:30, "Art" talk by Harold Swartz; 8, program through John Wright, "The Right Tailor." 10, Art Hickman's dance orch.

**WGY, Schenectady, N. Y., 380 (E. S. T.)**—11:55 A. M., time; 12:30 P. M., stock market; 12:40, produce market; 12:45, weather; 2, music and talk, "Meal Planning and Nutrition," New York State College; 6, produce and stock market; news; 6:15, report on New York State Highways; 6:30, Hotel Ten Eyck Orch.; Albany, N. Y.; 7:45, "A Few Moments with New Books," 8, one hour studio program; 9, Near East Relief Golden Rule Dinner at New York; the following speakers are expected: Charles Evans Hughes, Chief Justice William H. Taft, Elihu Root, Cleveland M. Dodge, Henry Morgenthau; 11:30, organ recital by Stephen E. Boisclair.

**WOR, Newark, N. J., 495 (E. S. T.)**—7 A. M., gym class, Arthur E. Bagley, director; 2:30 P. M., Emma E. Senger, lyric soprano; 2:45, Bessie Etkin, violinist; 3, lyric soprano; 3:15, Pathe

star, Madge Kennedy. 3:30, Bessie Etkin, violinist. 3:45, Winifred Moses, talk, "Making of Fondant." 6:15, Albert E. Sonn, Newark, N. J., Sunday Call, in "Radio for the Layman." 6:30, Tom Cooper's Country Club orch. 7:15, the day's sports by "Jolly Bill" tSeinke.

**WHN, New York City, 360 (E. S. T.)—12:30 P. M.**, Chas. Strickland's Palais D'Or orch. 6:30, Vincent Catanese's Alamac orch. 7:10, WHN employment broadcasting. 9:30, news. 9:37, Harry Harris, tenor. 9:45, Vladimir Tobachnik, baritone; Harry Moody, accompanist. 10, Spear's dance orch. 10:30, Harry Fox and Club Madrid orch. 10:45, Healey and Camp, piano and song. 11, Judith Roth and Al. Wilson, popular songs. 11:15, Bob Schaefer, songwriter and composer. 11:30, Lou Gold's orch., with Loretta McDermott, Herman, Adler and Weil. 12, Ted Lewis and his Symphonic Clowns, Revue Intime.

**Friday, November 21**

**WEEL, Boston, 303 (E. S. T.)—6:30 P. M.**, Dok-Eisenbourg and his Sinfonians. 7, Big Brother Club. 7:30, musicale. 8, musicale. 8:30, musicale. 9, program from New York Studio. 10, musicale.

**WGY, Schenectady, N. Y., 389 (E. S. T.)—11:55 A. M.**, time. 12:30 P. M., stock market. 12:40, produce market. 12:45, weather. 2, music and talk; "Lighting Fixtures Giving Best Service." Walter A. Bowe. 6, produce and stock market; news. 6:30, stories. 7, International Sunday School Lesson. 7:45, health talk; selection, "Melody"; farce, "Thirty Days."

**KDKA, E. Pittsburgh, 326 (E. S. T.)—7:30 A. M.**, calisthenics. 8:45, stockman reports; general market review and agricultural items. 11:55, time. 12, weather; stockman reports. 12:20 P. M., Sunday School lesson. 3:30, closing quotations on hay, grain and feed. 6:30, organ by Samuel Winters Ettelson. 7:15, Daddy Winkum, the Radio Rhymster. 7:30, Business Review, S. F. Fannon. 7:40, stockman reports. 8, Sunday School lesson. 8:15, "Some Recent Poetry," Frederick P. Mayer. 8:30, concert by Universal Quartet. 9:55, time; weather.

**KSD, St. Louis, 546 (C. S. T.)—8 P. M.**, concert by Sixth U. S. Infantry Band.

**WEAF, New York City, 492 (E. S. T.)—11 A. M.**, musical program and talk on "The Uses of Honey"; market and weather. 4 P. M., moonlight instrumental trio; children's stories. 6, Waldorf-Astoria music; stories for children by Blanche Elizabeth Wade; Maria Samuell, pianist; The Happiness Candy Boys; United States Navy Band.

**WOO, Philadelphia, 509 (E. S. T.)—11 A. M.**, organ. 11:30, weather. 11:55, time. 12, Tea Room Orch. 5:10 P. M., sports results and police reports. 5:15, organ and trumpets. 7:30, sports results and police reports; A. Candelori and Hotel Adelphia Orch. 8:30, program from Fox Theater. 9:10, Josephine McCulloch, soprano; Harry Snelson, tenor; Evelyn White, pianist; Kathryn Corey, pianist; Alma Wilson, accompanist. 9:55, time. 10:02, weather. 10:03, organ, Harriette C. Ridley. 10:30, Vincent Rizzo and his Hotel Sylvia Orch.

**WQJ, Chicago, 448 (C. S. T.)—11 A. M.**, Fred Mann and his Sunday dinner. 3 P. M., Miss S. Place, of the Infant Welfare Society; Mrs. Harry T. Sanger, Travelogue. 7, Williams and Rainbo Garden Orch.; Anton Deschermeier, tenor; Dorothe Schubert, soprano; Maridene Borresen, baritone; Fern Denicke, accompanist. 10, Williams and Rainbo Skylarks; the Verdi Trio, Mandolin, Guitar and Accordion; Nubs Allen, contralto; Lew Butler, the Giant of Radio; O'Flannigan and O'Hara, the two Frenchmen; Chicago Players, playlet; other artists.

**CKAC, Montreal, 425 (E. S. T.)—1:45 P. M.**, Mount Royal Hotel concert. 4, weather and stock reports. 4:30, lo lessons.

**WOC, Davenport, Ia., 484 (E. S. T.)—10 A. M.**, opening market quotations. 10:05, household hints. 10:55, time. 11, weather and river forecast. 11:05, market quotations. 12, chimes concert. 12:15 P. M., weather. 2, closing stocks and markets. 6:45, sport news and weather. 7, sandman's visit. 7:20, educational lecture—"Wool—From Producer to Consumer," by B. J. Stewart. 8, Orch of the Students' Auxiliary.

**WJY, New York City, 405 (E. S. T.)—7:30 P. M.**, Billy Wynne's Greenwich Village Orch. 8:15, "Chats With the Editor," Ernest A. Zadig. 8:25, Arthur Ball, tenor. 8:45, current topics, Wm. H. Allen. 9, Millstead and Sanchez, popular songs. 9:15, "Taxes," Frank Shevit. 9:25, Attilio Martini, violinist; Keith McLeod, accompanist. 9:45, Sara Lee, soprano; Keith McLeod, accompanist.

**WDAR, Philadelphia, 395 (E. S. T.)—11:45 A. M.**, almanac. 12:02 P. M., organ recital from Stanley Theatre; Arcadia Concert Orch., Feri Sarkozi, director; playlet. 4:30, dance program. 5:45, sporting results. 7:30, Dream Daddy. 8, "Turning the Pages," 10, meeting of the "Morning Glory Club"; Arcadia Dance Orch.; features from the Studio.

**WJZ, New York City, 455 (E. S. T.)—10 A. M.**, Housewives Menu, Mrs. Julian Heath. 10:20, book review. 10:40, arts and decorations. 10:50, Eleanor Gunn's fashion talk. 1 P. M., Hotel Ambassador Trio; Henry Vander Zanden, director. 5, Sara V. TuRits, soprano. 5:15, Briggs Hubbell, banjo and songs. 5:30, State and Federal agricultural reports; farm and home reports; New York Stock Exchange; foreign exchange; News. 7, Savarin Ensemble. 8, Wall Street Journal review. 8:10, N. Y. U. Air College; "Geology," Prof. J. Edmund Woodman. 8:30, Yale-Harvard Glee Club Concert.

**KFI, Los Angeles, 469 (P. S. T.)—5 P. M.**, Herald news. 5:30, Examiner news. 6:45, organ recital. 8, Herald program. 9, Examiner Studio.



**THREE STARS OF WLW**—At the left and center are the well-known Henry J. Lange and Marion McKay, of Lange-McKay Castle Farm Orchestra fame. Fred Smith, at the right, is showing them a letter from an enthusiastic admirer. WLW is the Crosley station at Cincinnati.

10, Swartz Sisters Trio. 11, Ambassador Hotel Orch.

**WGBS, New York City, 316 (E. S. T.)—10 A. M.**, timely talks by Terese. 10:10, Estelle Lieblich program. 10:20, Real Romance of America, "Gertrude B. Tucker." 10:30, Estelle Lieblich program. 10:40, Living Age Digest of News. 10:50, Estelle Lieblich program. 1:30 P. M., dance program, Parodi's Orch. 3, interview by Terese Rose Nagel with William Kent of "Rosemarie," and Richard Dix, movie star. 3:10, Dorothy Virginia Sutton, soprano. 3:20, Maybelle A. Burbridge, in "Beauty Talk." 3:30, Dorothy Virginia Sutton, soprano. 3:40, Harold Fields of the League of Foreign Born Citizens. 3:50, Dorothy Virginia Sutton, soprano. 6, Uncle Geebee. 6:30, Nat Martin's "I'll Say She Is" Orch.

**WRC, Washington, 469 (E. S. T.)—3 P. M.**, "Women's Wear." 3:10, song recital. 3:20, "Beauty and Personality," by Elsie Pierce. 3:25, current topics. 3:35, piano recital. 3:50, the Magazine of Wall Street. 4, song recital. 6, stories for children.

**KHJ, Los Angeles, 395 (P. S. T.)—12:30 P. M.**, program of news items and music. 2:30, matinee musicale. 6, Art Hickman's dance orch. 6:30, children's program. 8, Los Angeles Flute Club. 10, Art Hickman's dance orch.

**WOR, Newark, N. J., 405 (E. S. T.)—7 A. M.**, gym class, Arthur E. Bagley. 2:30 P. M., Sara Dunn, mezzo soprano. 2:45, Queenie Smith and Jack Donahue in humor and song. 3:15, Richard Duffy, on "The Conquest of Happiness." 3:30, Sara Dunn. 3:45, "The Trend of Etiquette in United States," Emily Post. 6:15, Clifford Lodge orch. 6:30, "Man-in-the-Moon" stories by Josephine Lawrence. 7, Lodge orch. 7:15, day's sports by "Jolly Bill" tSeinke.

**WHN, New York City, 360 (E. S. T.)—6:30 P. M.**, Vincent Catanese's Alamac orch. 7, Harry Riheman and his orch.; Eddie Elkins and his orch. 9:30, news. 9:37, Dan Gregory and Palace orch. 10, fashion chats by Mme. Bello. 10:10, Bob Miller and Ira Schuster, popular songs. 10:25, "Storage Baatteries," by H. W. Shontz. 10:30, Sam Lannin and his Roseland dance orch. 11, Arthur Ball, lyric tenor. 11:15, Irving Mills and Sammy Fain, songs. 11:30, Sam Wooding and Club Alabama orch. 12, Ted Lewis and his Symphonic clowns.

**Saturday, November 22**

**KDKA, E. Pittsburgh, 326 (E. S. T.)—9:45 A. M.**, stockman reports. 11:55, time; weather. 12, stockman reports. 1:30 P. M., concert by Daugherty's Orch. 2:30, Carnegie Tech-Quantic Marines football game from Forbes Field, Pittsburgh. 6, Westinghouse Band, under the direction of T. J. Yastine. 7, Wimple, the Wanderer. 7:30, sport review by James J. Long. 7:45, features. 8:30, Westinghouse Band. 9:55, time; weather.

**KSD, St. Louis, 546 (C. S. T.)—8 P. M.**, For the housewife. 8, St. Louis Symphony Orch., Rudolph Ganz, conductor; 11, Varsity Club Orch.

**WEAF, New York City, 492 (E. S. T.)—1:45 P. M.**, play by play description of the Harvard-Yale football game, direct from the Yale Bowl at New Haven, Graham McNamee announcing. 4:00, Clifford Lodge Orch. 6, music Hotel Waldorf-Astoria; boys' stories by Fred J. Turner; Genevieve McKenna, dramatic soprano; Anna Daly, violinist, and Anita Fontaine, pianist; Waldorf-Astoria Orch.; Vincent Lopez and his Orch.

**WOO, Philadelphia, 509 (E. S. T.)—11 A. M.**, organ. 11:30, weather. 11:55, time. 12, Tea Room Orch. 5:10 P. M., sports results and police reports. 5:15, grand organ, trumpets, J. W. C. I. Band, Arthur A. Rosander, director. 9:55, time. 10:02, weather.

**WOJ, Chicago, 448 (C. S. T.)—11 A. M.**, Mrs. Frank Nichols, talk; H. F. West. "Pressure Cookers." 7 P. M., Williams and His Rainbo Garden Orch.; Mme. Johanna Young, soprano;

Carl G. Linner, pianist. 10, Williams and His Rainbo Skylarks; Jerry Sullivan, song writer; Sandy Meek, Scotch tenor; Clarence Theders, tenor; Lew Butler, the Giant of Radio; The Melodians, Laurie, Eddie and Bennie; other radio artists to be announced.

**CKAC, Montreal, 425 (E. S. T.)—7 P. M.**, Kiddies' stories in French and English. 7:30, Rex Battle and his Mount Royal Hotel Orch. 8:30, La Presse Studio concert. 10:30, Joseph C. Smith and his Mount Royal Hotel Dance Orch.

**WGBS, New York City, 316 (E. S. T.)—10 A. M.**, timely talks by Terese. 10:10, Helen Carner, pianist. 10:20, Bella N. Zilberman, "Education of Children." 10:30, Helen Carner, pianist. 10:40, Susan Salt, Talk on Rugs. 10:50, Helen Carner, pianist. 1:30 P. M., Gertrude Casrial, pianist; Charles C. Hohmann, bass. 3, club woman's period. 3:10, Richard Brown, pianist. 3:20, Lucy Stone, symposium. 3:30, Richard Brown, pianist. 3:40, shopping talk. 3:50, Richard Brown, pianist. 6, Uncle Geebee. 6:30, Pearl Smith, barnyard imitations. 6:40, Edna Frandini, soprano. 7, Mary Beaton, swimming talk. 7:15, Edna Frandini, soprano. 9:30, movie chats, by Sam Comly. 9:40, Vaughn DeLeath, original Radio Girl. 10:10, Hotel Empire, Concert Trio. 11, special musical program.

**WOC, Davenport, Ia., 484 (E. S. T.)—10 A. M.**, market. 10:05, household hints. 10:55, time. 11, weather and river forecast. 11:05, market quotations. 11:10, agricultural bulletins. 12, chimes concert. 12:15 P. M., weather. 12:17, closing markets. 6:45, sport news and weather. 7, sandman's visit. 7:30, discussion of the International Sunday School Lesson. 9, The Palmer School Radio Orch., Ralph W. Fuller, baritone soloist.

**WDAR, Philadelphia, 395 (E. S. T.)—11:45 A. M.**, almanac. 12:02 P. M., organ; features from the Studio; Arcadia Concert Orch. 2, Arcadia Orch.; artist recital. 4:30, dance program by the Cotton Pickers. 5:45, sporting results. 7:30, Dream Day.

**WJZ, New York City, 455 (E. S. T.)—2 P. M.**, play by play description of the Harvard-Yale game direct from New Haven by Ennis Brown, noted football authority, and J. Andrew White, famous sport announcer. 7, Waldorf-Astoria Dance Orch. 8, talk by Mr. W. J. L. Banham. 8:15, Radio Franks; Wright and Bessinger. 8:30, harp concert. 10:15, "Community Day," Prof. Walter Pettit. 10:30, Hotel Astor Dance Orch.

**KFI, Los Angeles, 469 (P. S. T.)—5 P. M.**, Herald news. 5:30, Examiner news. 6:45, dance orch. and vocalist. 8, Althea Oliver, mezzo-soprano, and assisting artists. 9, Examiner Studio. 10, Packard Radio Club. 11, Ambassador Hotel orch.

**WRC, Washington, 469 (E. S. T.)—6 P. M.**, children's hour. 7:45, bible talk. 8, song recital by Albert Sterns, baritone. 8:15, to be announced. 8:30, Viola Harper, soprano. 8:45, Sue Hays, mezzo-soprano. 9, concert by Elena De Sene string quartet. 9:20, Roosevelt Hotel Trio. 9:55, time. 10:30, dance program.

**KHJ, Los Angeles, 395 (P. S. T.)—12:30 P. M.**, Greater Pico Street Association. 2:30, matinee musicale. 6, Art Hickman's Concert Orch. 6:30, children's program. 8, program through Union Oil Company. 10, Art Hickman's dance orch.

**WIP, Philadelphia, 509 (E. S. T.)—1 P. M.**, organ recital by Karl Bonawitz. 1:30, weather. 1:45, "Canned Food Week," by Mrs. Anna B. Scott. 2, play by play description of the football game between Rutgers and Bucknell, broadcast direct from Franklin Field. 6, weather. 6:05, dinner music by the Hotel St. James Orch. 6:45, live stock and produce market reports. 7, Uncle Wip's bedtime stories and roll call for the children. 8, a talk, "Successfully Rehabilitated," under the auspices of the U. S. Veteran Bureau. 8:15, a program of Negro music, by distinguished Negro composers and Negro artists, under the direction of Carl Diton, chairman of the National Association of Negro Musicians. 9:15, Colonial Glee Club, under the direction of Thelma Melrose Davies. 10:05, Art Coogan and his Club Madrid Orch. 11:05, organ, Karl Bonawitz.

**WOR, Newark, N. J., 405 (E. S. T.)—7 A. M.**, gym class, Arthur E. Bagley. 2:30 P. M., recital by Argyle trio. 2:45, Adelaide Gescheidt and artists—Anne Tindale at the piano. 3, "Mysticism of Marie Corelli," by John Romiser. 3:15, Argyle trio. 3:30, Adelaide Gescheidt and artists; soprano solos, Marian Vandersall; baritone solos, Bentley Ford; duet. 6:15, Harry Lafferty's Canary Cottage Inn orch. 7:15, day's sports by "Jolly Bill" tSeinke. 8, Broadway Baptist Church choir. 8:45, Dr. Harvey W. Wiley, former chief chemist of the United States, talking on "How You Can Add Years to Your Life." 9, joint recital by Ottilie Winn, soprano, and Frederick Vettel, tenor. 9:20, program by the South Side High School. 10, joint recital. 10:15, "Who's New in the Electrical Field," by eGorge M. Ogle. 10:20, Corson Commandery band of Asbury Park.

**WHN, New York City, 360 (E. S. T.)—6:30 P. M.**, Vincent Catanese's Alamac orch. 7:30, Hotel Carlton terrace orch. 8, Arthur Stone, famous blind pianist. 8:15, "Goodnight Children." 8:30, Metropolis trio, popular songs. 8:45, Alfred Dulin, concert pianist. 9, Original Frisco Jazz Kings. 9:30, "Has the Constitution Failed," by Jos. T. Cashman. 9:40, Ida Romaner, soprano, with Alex Ermoloff, pianist, Mrs. T. Ermoloff, soprano. 9:50, Jimmy Flynn, dramatic tenor. 10, Jack Wehrien with Ed. Besches, pianists. 10:15, Clarence Wil-

(Concluded on page 18)

**Index to Radio World**

Issues from Jan. 5 to Sept. 20, 1924, thoroughly indexed and cross-indexed. Send 15 cents for copy of Oct. 18 issue to Radio World, 1493 Broadway, New York City.

# Studio on Broad Highway



**B R O A DCASTING** done right before the public gaze has its fascination, but when the business of having one's picture taken is before the house, even exploited broadcasting is relegated to the background. WJZ, whose aerial towers atop the Aeolian Building in East Forty-second Street are one of the sights of New York City, utilized the show-window on the street floor to exhibit their latest style of broadcasters. Arthur Kraft, lyric tenor, and Frank La Forge, pianist, are pictured. (Kadel & Herbert)



**AT RIGHT**, the joy of getting a DX station, say 2,000 miles away, is one of the radio thrills bound to bring a smile to any fan's face. Hence the beaming countenance.



**UP IN THE ATTIC**, Edward Davidson, 396 Friendship Street, Providence, R. I., armed with a jimmy pipe, is engaged on a DX hunting expedition, aided by RADIO WORLD, whose accurate list of stations enables him to identify distant announcers who seem to have a sore throat. An alarm clock before him serves to remind him when breakfast time arrives. On the wall hangs a map.



**EARL SANDE**, famous jockey, badly injured in a spill when the Saratoga racing season opened last Summer, is back home from the hospital, his convalescence speeded up by the joy of radio. He is shown at his home with his wife. Sande, who rode Zev to victory against Papyrus, says he'll be back in the saddle next Spring, if he can spare the time from his set. (United).

# Elected



**WM. HOWARD TAFT**, only living ex-President, now Chief Justice of the United States Supreme Court, was photographed just after being elected Chief Judge of DX receivers. He carried all States (to his ears) except Wisconsin and the Southern Tier, where the Static Party won an unpopular majority. (Henry Miller).

# Ches



**THE CITY COLLEGE** campaign. This cities, the competitor. Photo shows reception over a merry time of its radio apparatus. discussed at reception as work but as a notion that



**THE RECORD** for the farthest reception is claimed by William Choat, operator of the S.S. Arctic (Canadian). Anybody who desires to challenge his claim—and the challenge is perilous—may write him at P. O. Box 390, Montreal, Canada.



**THE RETURNS** moment's delay. then only on Sunday. Here we see a selective agency and The signals came

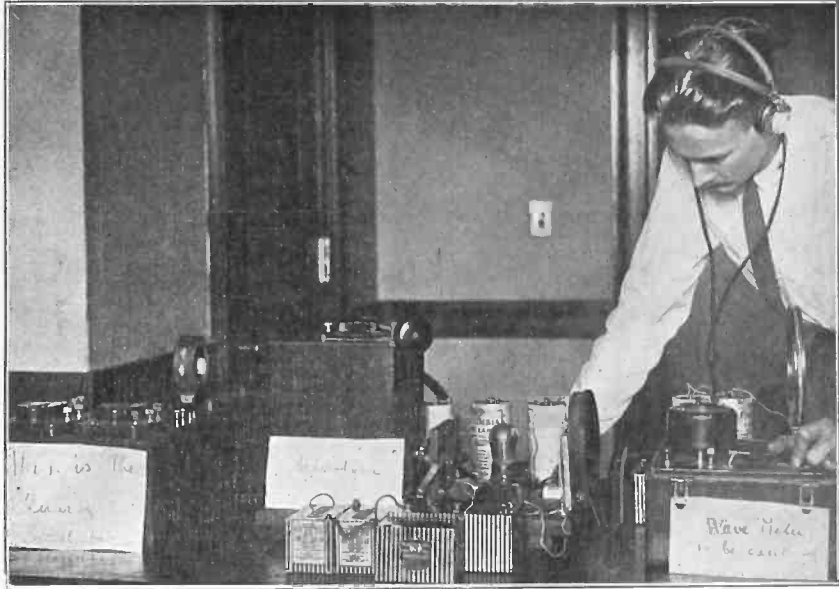


# Match Radioed



**RADIO CLUB** is preparing for an active winter chess matches between contestants in distant places flashing their moves to their opponents via the test match. Besides code, phone transmission and telegraph is undertaken and, all told, the boys have a busy time. Their quarters are equipped with the latest and best radio apparatus. Experiments are conducted and reports read at their meetings. This the student members do not figure out. And some of the fathers of to-day have the mistaken idea that the boys would rather play than work. Never!

# Crystals Tested as Oscillators



**CRYSTALS** as radio-frequency amplifiers are being tested by the Bureau of Standards in Washington, D. C. H. DeGroot is shown engaged in research work. At left is the quartz oscillator, next the Heterodyne and at right the wavemeter to be calibrated. The arrangement is used for frequency standardization. (Henry Miller).



**AT RIGHT**—A 1-dial set that operates a loudspeaker is the proud possession of this fan.



...the thing and they must be obtained without a football results come second only to S.O.S. calls, and holidays, in the estimation of the football fans. ...ged up in the street, with a loop used as the coil and the loudspeaker erected on the top of an automobile. ...strong and clear and assembled fans were overjoyed.



**WHEN** there's a radio show in town you may be sure that the younger element can't be kept away from it. And why should they?

# Programs

## Saturday, November 22

(Concluded from page 15)

Williams radio trio. 10:45, George Natanson, popular songs with piano and ukulele accompaniment. 1, Jimmy Clarke and entertainers. 11:30, Sam Lannin and his Roseland dance orch.

## Sunday, November 23

**WEEL, Boston, 363 (E. S. T.)**—3:45 P. M., program from New York Studio. 7:20, Mark Strand Theatre program, N. Y. City.

**WCAE, Pittsburgh, 462 (E. S. T.)**—10:45 A. M., services from Rodef Shalom temple. 3, People's Radio church services. 4, piano recital by Prof. Otto Kalteis. 6:30, concert from William Penn hotel.

**WHO, Des Moines, Ia., 526 (E. S. T.)**—7:30 P. M., The Bankers' Life Radio artists.

**WOO, Philadelphia, 509 (E. S. T.)**—10:30 A. M., morning services from Bethany Presbyterian Church; Rev. A. Gordon MacLennan, pastor. 2:30 P. M., musical exercises opening Sunday school. 6, old-time hymns and melodies and sacred chimes recital.

**CKAC, Montreal, 425 (E. S. T.)**—4:30 P. M., sacred concert.

**WDAF, Kansas City, Mo., 411 (C. S. T.)**—4 P. M., program by the Mu Phi Epsilon Musical Society.

**WLW, Cincinnati, 423 (C. S. T.)**—9:30 A. M., school by staff of Sunday school publications. 11, services of Church of Covenant, Dr. Frank Stevenson, minister. 7:45 P. M., services of the First Presbyterian Church, Dr. Frederick McMillan, minister. 8:45, concert by the Western and Southern orch., William Kopp, director; soloist, Dan Beddoe, tenor.

**WCBD, Zion, Ill., 345 (C. S. T.)**—8 P. M., Mrs. Mayfield and Mrs. Faassen, soprano and alto; Miss Ida Peterson and Mrs. Evelyn Uhlrik Dewey, soprano and alto; Mrs. Mayfield, soprano; Mr. M. P. Barton, tenor; Mr. E. B. Paxton, baritone; Miss Edith Teeple, reader; Mrs. Lillia Albrant Leech, piano; Mr. Herman Becker, cello.

**WIP, Philadelphia, 509 (E. S. T.)**—4 P. M., services under the auspices of the Germantown Y. M. C. A. 7:15, evening service, broadcast direct from Holy Trinity Church. 9:30, Ben Stad and his WIP Symphony orch.



**KATHERINE SPENCER**, noted stage beauty, who broadcast from WOR, discussing censorship.

**WBZ, Springfield, Mass., 337 (E. S. T.)**—10:45 A. M., church services transmitted from Church of the Unity, Reverend Charles A. Wing, pastor. 8 P. M., "The Larger Americanism," by James T. Williams, Jr., editor in chief of the Boston Transcript. 8:30, Estey organ, E. Rupert Sicrom, organist. 9:30, Ethel Cury, soprano; Alma Gerish, accompanist; Matthew J. Dickinson, baritone; C. Edward Eaton, accompanist.

## Monday, November 24

**WCBD, Zion, Ill., 345 (C. S. T.)**—8 P. M., Thomas, Mrs. Thomas, Mrs. Larose and Barton, mixed quartet; Mrs. Thomas, Mr. Barton and Mr. Thomas, trio; J. D. Thomas, baritone; Grace Windle, contralto; L. J. Hire, viola; Miriam Hollingshead, flute; Mrs. Mary Oakes Bagg, reader; Bessie Wiedman, piano.

**KGO, Oakland, Cal., 312 (P. S. T.)**—1:30 P. M., N. Y. stock reports. 1:40, S. F. stock reports. 1:45, weather. 3, studio musical program. 4,

Henry Halstead and dance orch. 5:30, Aunt Betty stories. 6:45, N. Y. stock reports. 6:55, S. F. stock reports. 7, weather. 7:05, S. F. produce. 7:10, baseball scores. 7:15, news items. 8, educational program.

**WWJ, Detroit, 517 (E. S. T.)**—8 A. M., calisthenics. 9:30, "Tonight's Dinner" and a special talk. 9:45, Public Health Service. 10:25, weather. 11:55, time. 3 P. M., The Detroit News orch. 3:50, weather. 3:55, market reports. 7, News orch.; T. Stanley Perry, tenor.

**WFAA, Dallas, Tex., 476 (C. S. T.)**—12:30 P. M., address, Epps G. Knight. 8:30, musical recital by Mrs. R. H. Morton.

**WCAE, Pittsburgh, 462 (E. S. T.)**—12:30 P. M., news; weather. 3:30, news; library news. 4:30, stock market reports. 6:30, dinner concert from William Penn Hotel. 7:30, Uncle Kaybee. 7:45, special feature. 8, music chat by Mrs. Ethel Davis. 8:15, radio dancing lesson by Arthur Murray. 8:30, concert by artist-pupils. 9, concert by the A. & P. Gypsy string ensemble. 10:30, Flight of The Mythical Dirigible; Miller's Original orch.

**WHO, Des Moines, Ia., 526 (E. S. T.)**—7:30 P. M., talk on "Care of Teeth" by Emma Weisgerber; Mr. J. E. Scovel, baritone. 8, talent, under direction of Dean Holmes Cowper. 11:15, organ recital, L. Carlos Merz.

**CKAC, Montreal, 425 (E. S. T.)**—1:45 P. M., Mount Royal Hotel concert, 4, weather and stock market. 4:30, Ho lessons.

**WLW, Cincinnati, 423 (C. S. T.)**—10:45 A. M., weather; business reports. 1:30 P. M., business reports. 3, market reports. 4, lesson in "Ho"; Babson reports. 8, popular program, Alvin Roehr's Music Makers; Copley Theatrical Review. 9, special program, Wendell Hall, Cooper Corporation orch. and male quartet.

**KGO, Oakland, Cal., 312 (P. S. T.)**—1:30 P. M., N. Y. and S. F. stock reports and weather. 4, orch. of the Hotel St. Francis. 6:45, stock reports, weather, S. F. produce news, baseball scores and news items. 8, Aahmes Shrine band; address, Franklin R. Heley, Potentate; French horn solo, Herman Trutner, Jr.; Elise Banta Crane, contralto; Nonsense Philosophy, "A Dog's Life," Otto Riehl; Aahmes band saxophone concert; violin solos, Herman Trutner, Jr. 10, Henry Halstead's orch. and soloists.

**WWJ, Detroit, 517 (E. S. T.)**—8 A. M., calisthenics. 9:30, "Tonight's Dinner" and a special talk. 9:45, Fred Shaw, pianist and songster. 10:25, weather. 11:55, time. 3:50 P. M., weather. 3:55, market reports. 7, Wronski mixed quartet.

**WBZ, Springfield, Mass., 337 (E. S. T.)**—11:55 A. M., time, weather, Springfield market report. 6 P. M., Westinghouse Philharmonic trio. 7, market report. 7:05, bedtime story. 7:15, "Bringing the World to America," by Our World; news from the National Industrial Conference Board. 7:30, lesson of a course in modern American literature. piano recital by Elmer F. Orne. 8:15, soprano recital by Mrs. Effie Lundin. 8:25, "Wallie" eSitz. 8:35, talk by George Paatterson on "Starlore." 9, concert by the Aleppo Drum Corps. 9:30, Westinghouse trio. 9:55, time, weather. 10:01, musical program continued. 10:30, McEnelly's singing orch.

**WMAQ, Chicago, 447.5 (C. S. T.)**—4 P. M., Mothers in Council. 4:30, one of the series of talks on English, Mrs. Alexandra Jenkins. 6, Chicago theatre organ. 6:30, Hotel LaSalle orch.

## Tuesday, November 25

**WLW, Cincinnati, 423 (E. S. T.)**—10:45 A. M., forecast and business reports. 1:30 P. M., business reports. 3, market reports. 4, lesson in "Ho"; Thanksgiving dinner talk by Miss Eleanor Ahearn; recital by pupils of William Kyle. 9, Wendell Hall, concert by the Ohio Rubber quartet; entertainment from Goodwin's Palm Gardens. 11, program continued.

**CKAC, Montreal, 425 (E. S. T.)**—4 P. M., weather and stock reports. 7, kiddies' stories in French and English. 7:30, Rex Battle and his Mount Royal orch. 8:30, La Presse variety entertainment. 10:30, Joseph C. Smith and Mount Royal orch.

**WCAE, Pittsburgh, 462 (E. S. T.)**—12:30 P. M., news; weather. 3:30, news. 4:30, stock market. 6:30, concert from William Penn Hotel. 7:30, Uncle Kaybee. 7:45, concert by the Mellow Moon serenaders. 9, concert by the Eveready entertainers. 10:30, entertainment by "Sid" and Loew's Aldine theatre gang.

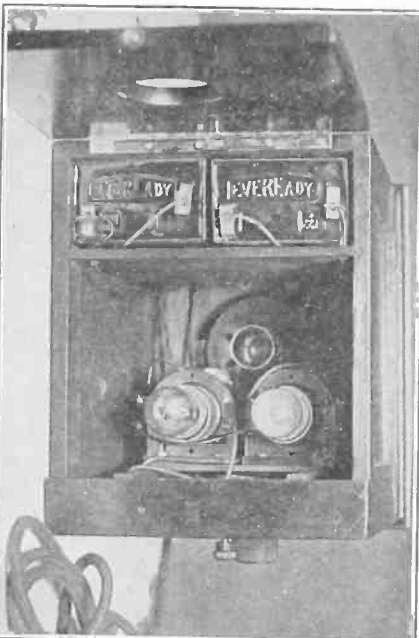
**WFAA, Dallas, Tex., 476 (E. S. T.)**—12:30 P. M., music by the Red-head Girl and Count Rubinoffsky, Russian pianist. 8:30, Mrs. D. A. Little and Mrs. Sam R. Harwell, solo and duet, and Victoria Howard, pianist. 11, organ recital by Dwight Brown.

**WBZ, Springfield, Mass., 337 (E. S. T.)**—11:55 A. M., time, weather, Springfield market report. 6 P. M., Leo Reisman Hotel Lenox ensemble. 6:30, Copley-Plaza orch. 7, market report. 7:05, bedtime story. 7:15, world market survey. 7:30, Leo Reisman and Hotel Brunswick orch. 8:30, John A. Scott, tenor and cornetist, and mixed quartet. 9:30, Marjorie Posselt, violinist and soprano. 9:55, time, weather. 10, special international radio week program in the international language, "Esperanto."

**WMAQ, Chicago, 447.5 (C. S. T.)**—12 M., program under Illinois Manufacturers' Association. 4 P. M., American Red Cross nursing talk, Estelle Weltman. 4:30, musical program by pupils of Chicago Philharmonic conservatory. 6, Chicago theatre organ. 6:30, Hotel LaSalle orch. 8, The Daily News' book review. 8:20, travel talk, by Clara E. Laughlin. 8:40, talk from Chicago Association of Commerce. 8:50, U. of Chicago semi-weekly lecture. 9:15, program by the Gunn school.

## Election Returns Heard Aboard a Train

RADIO election returns were served to passengers aboard speeding passenger trains successfully for the first time in history the night of the Presidential election, marking an epoch in the progress of wireless transmission. Approximately 1,000 passengers traveling between New York and Chicago aboard the Twentieth Century Limited on the New York Central Railroad heard the news reports of the counting of the national voting continuously from 7:15 p. m. until 1 o'clock next morning. The receiving sets were placed on the book-case shelves at the forward end of the observation cars at the rear of the trains, each one manned by an engineer of the Western Electric.



A COMPACT SET is this 2-tube reflex, the two B batteries side by side, the two 4 1/2-volt A batteries underneath.

## Literature Wanted

THE names of readers of RADIO WORLD who desire literature from radio jobbers and dealers, are published in RADIO WORLD on request of the reader. The blank below may be used, or a post card or letter will do instead.

Service Editor,  
Radio World,  
1493 Broadway, New York City.

I desire to receive radio literature.

Name .....

City or town .....

State .....

Dealer ? .....

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- Iran M. Carlson, New York City.
- W. C. W. Haslam, 1313 Earl St., Philadelphia, Pa.
- 9HP; R. A. Gerrard, 308 Birchwood Ave., Louisville, Ky.
- O. M. Burrows, Exeter, N. H.
- Joseph D. Mirault, 168 Sargent St., Holyoke, Mass.
- Fred Zimmerman, 205 E. 10th St., N. Y. C.
- Jno. A. Rose, 32 W. 40th St., N. Y. C.
- Edw. Carman, 514 W. 168th St., N. Y. C.
- Clifton Andrews, Syracuse, Neb.
- Joe W. Smith, Box 12, Rockport, Ind.

## RESULTS

**WHAT Results Did You Obtain from Constructing Sets or Parts Following Data Published in Radio World? Write to Results Editor, Radio World, 1493 Broadway, New York City**

# Storm Raised Over Hayden's Set

### RESULTS EDITOR:

THE illustrated description of the supposedly Radiola III circuit by Herbert E. Hayden in the Oct. 4 issue of RADIO WORLD will not work as shown, because the most important feature of this alleged 1-tube DX circuit is omitted, possibly purposely; as I have never seen a correct published diagram of this circuit. The circuit as shown will be correct if the plate rotor is wound in a reverse direction from all the other windings. The writer uses this circuit with two stages of audio, with an inside antenna and hears most of the 500-watt stations in the United States and Canada, all the 1000-watt stations and many others.

I use 199 tubes and Type E Baldwin phones. After trying numerous circuits this was selected as the best for distance, volume, selectivity and quality. The antenna is composed of 6 wires (No. 14), 42 feet long, spaced 4½ feet apart, and connected together at both ends. The wires are supported by porcelain insulators on the under side of the roof, which is covered with slate. H. B.

\* \* \*

### RESULTS EDITOR:

I HOOKED up the 1-tube DX set described by Herbert E. Hayden in RADIO WORLD, issue of October 4, and the results were far greater than what you promised. I have four good sets on hand, giving entire satisfaction, but from now your 1-tube DX set will be my exclusive pet. My coil for the set was a home-made affair, wound on a cardboard tube as per your specifications. Fixed condensers are of Freshman and Dullier make. The set is very easy to assemble, inexpensive and gives excellent results on local and DX reception. It is selective and very sensitive, which qualities give such remarkable long-distance results. Please accept my sincere thanks for publishing the 1-tube DX set, and in the future RADIO WORLD will be my weekly companion.

WM. A. GODLEWSKI,  
449 Wallace Ave.,  
St. Louis, Mo.

\* \* \*

Sta. B, R-1,  
Columbus, O.,  
Oct. 11, 1924

### RESULTS EDITOR:

THE 1-tube set by Herbert E. Hayden, Oct. 4 issue, is great. I have been using this set with 201A tubes, 30 ohm rheostat in detector, and a 6 ohm rheostat in amplifier. Instead of the fixed condensers in aerial I use a good 23-plate variable, with a Freshman verner dial. I use a few turns less on the stationary coils AB, P & L, and a few more turns on the rotors. The substitution of the variable condenser will make it the best 3-tube set I know of. My AFT are high-ratio Acme.

ELMER R. COE.

\* \* \*

### RESULTS EDITOR:

I NOTE that you invite correspondence from makers of any of the circuits described in RADIO WORLD. It might interest your readers to know how I made a coil for the 1-tube set described by Herbert E. Hayden in the Oct. 4 issue. Not having a tubing of the right size at hand and being too busy to make one I wound the coils, both stator and rotor, in basket weave fashion by drawing circles on a 1" board, putting in 15 dowels 3/16" for stator and 13 for rotor. I

cemented the wire at crossings between dowels with collodion. Then I cut a piece of 3/16 hard rubber panel to 1" x 8" and clamped it to panel and drilled two 3/16 holes where the rotor shafts would come and a hole in each end for No. 8 brass machine screws, then remove the strip from panel and enlarge the rotor holes in panel to ¼". I then drilled ¼" holes in the 1" x 8" strip exactly where the coils would come and countersunk these holes on the side next to panel. I then melted up some composition from top of an old dry cell and, holding the coils exactly in place, I poured enough of the composition through the countersunk holes in the panel strip to hold the coils firmly in place. I further reinforced the coils by running a piece of 3/16 rubber rod through the dowel holes in the coils at the fifth hole from where they were cemented to the strip and another in the 10th series of holes.

I then turned down two pieces of ¼" rubber rod to 3/16 just far enough to make a shoulder at the 1" x 8" strip, drilled a small pin hole through the 3/16" part of rod 3/16 from the shoulder and threaded the end. I then cut two pieces of the 3/16 in. panel stuff ¾" wide and as long as the rotor coils were wide. In exact center I drilled and tapped hole for rotor shaft and each side of this hole drilled and counter sunk ¼" holes. The rotor coils were now mounted on these pieces, pigtail connections-soldered on and other connections of coil soldered.

The coil was then mounted on panel with No. 8 machine screws and 1" rubber tubing for bushings, the rotor shaft run in the holes and pinned and then screwed into the tapped holes in the rotor mountings. The set was then completed along the lines as given by Mr. Hayden, except that I mounted the panel upright and used a larger cabinet. It is, without exception, the most powerful 1-tube set I ever tested. I tried it out last night and could bring in about every station on the map within 1,500 miles with a volume and quality of tone that is surprising.

CHAS. W. GRAY,  
Brisben, N. Y.

\* \* \*

### RESULTS EDITOR:

I HAVE been a reader of your wonderful magazine for about two years and have often wished information concerning the circuit you publish in Oct. 4 issue and now I have it the 1-tube DX set. I am anxious to tell you and the readers of RADIO WORLD how I appreciate this information. I have constructed this circuit as per Herbert E. Hayden's instructions and it is a perfect receiver. I constructed this circuit at a cost of \$8.90, winding and making the tuner myself. I completed it Oct. 9 and have heard all the stations I am used to hearing, ranging in distance up to 1,500 miles, with more volume than ever before.

JOE BOYD,  
Box 167, Wyona, Okla.

### USE 125 FEET FOR AERIAL

FOR an aerial use a single copper wire about 125 feet long, including the lead-in. The higher the wire the better will be the results. If you wish to favor reception from the west, point the antenna toward the west and take the lead-in off the western end of the wire. Keep the antenna and lead-in free from touching any objects such as trees, wires or the house.



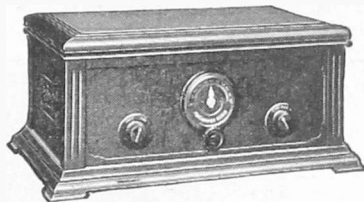
Patented in U. S. A. and Foreign Countries

## Receivers

THE Magnavox circuit is a highly perfected form of tuned radio frequency with Unit Tuner, characterized by exceptional selectivity, clearness and volume.



TRF-50 (as illustrated)—is a 5-tube tuned radio frequency receiver with built-in Magnavox Reproducer unit . . . . . \$150.00



TRF-5 (as illustrated)—is identical with the above but encased in smaller cabinet without built-in Reproducer . . . . . \$125.00

With the development of these Magnavox Receivers, radio has entered the stage of permanent design.

From simplicity of control to reliability of performance, the Magnavox cabinet sets offer the utmost value in their field.

Magnavox Radio Products are sold by good dealers everywhere. Catalog on request.

THE  
**MAGNAVOX**  
COMPANY

New York: 350 West 31st Street  
San Francisco: 274 Brannan St.  
Canadian Distributors: Perkins Electric Limited,  
Toronto, Montreal, Winnipeg

## A THOUGHT FOR THE WEEK

**E**LECTIONS may come and elections may go but Radio will run on forever—or at least as long as the ether lasts.

# RADIO WORLD

Take Along U.S. Plus One



TELEPHONE: LACKAWANNA 8978, 2063

PUBLISHED EVERY WEDNESDAY

(Dated Saturday of same week)

FROM PUBLICATION OFFICE

HENNESSY RADIO PUBLICATIONS CORPORATION

ROLAND BURKE HENNESSY, President

M. B. HENNESSY, Vice-President

FRED S. CLARK, Secretary and Manager

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TECHNICAL EDITOR, Abner J. Gelula

## SUBSCRIPTION RATES

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Receipt by new subscribers of the first copy of RADIO WORLD mailed to them after sending in their order, is automatic acknowledgment of their subscription order. Changes of address should be received at this office two weeks before date of publication. Always give old address also. State whether subscription is new or a renewal.

## ADVERTISING RATES

BATES—Page, 7 1/4 x 11", \$200.00; half page, 3 1/4 D. C. or 3 1/2 x 3 1/2" col., \$100.00; quarter page, 4 1/2 D. C., \$50.00; one col., 2 1/4 x 11", \$25.00; \$7.00 per inch. Per space line, 50c. Times Discounts: 5% Consecutive Issues, 20%; 26 Times Consecutively, or E. O. W. One Year, 15%; 4 Consecutive Issues, 10%.

## CLASSIFIED ADVERTISEMENTS

Ten cents per word. Minimum, 10 words. Cash with order.

Entered as second-class matter, March 28, 1923, at the Post Office at New York, New York, under the act of March 3, 1879.

NOVEMBER 22, 1924

## The Pointed Program

**A** FELLOW who had little jack and who wanted to open a broadcasting station found out that it required a pair of jacks or better.

\* \* \*

**T**O determine the efficiency of your set, divided the distance of the farthest station you have received by the number of tubes and add one stage of audio-frequency.

\* \* \*

**B**ODY capacity is often determined at the dinner table.

\* \* \*

**S**OME democratic persons with Super-Heterodynes even bid the time of the day to crystal set owners.

\* \* \*

**A** GOOD way to cut out interference is to turn the rheostat knob until the indicator points to the "off" side.

\* \* \*

**S**TRONG signals burden the antenna so much that it is a common sight to see aerial masts at the Neutrodyne angle—57.3 degrees.

## Too Much DX for Fido



## The Ignorant Treachery of Some Dealers Hurts Radio

**Y**OU would not expect to have electric washing machine salesmen going from house to house saying: "Madam, these machines are an awful nuisance; they do no good; won't you please buy one?" Perhaps some feminine humorist, with money to spare, would buy one—and, lo and behold, she would find it excellent. She would tell her neighbors about its wonders. And meanwhile the salesman would still be making the rounds, telling the good women of the community that his wares were next to worthless, while the comparatively few customers, all of them well satisfied, were doing their philanthropic best to live down the salesman's strange assertions.

It would indeed be a topsy-turvy world in which such things happened. Yet they are happening in the radio trade, every day, every week, year in, year out. Dealers permit fierce barking and heinous noises to be emitted from distorting amplifying devices attached to demonstration receivers. Everybody is familiar with this capital offense against the ear. One walks faster, to get out of hearing of the program as it is being butchered with the dealer's delighted sanction.

Meanwhile thousands on thousands of persons who would have radio sets do not buy any because they think that quality reception is something not yet attained by radio and that the offending dealer's example of audible savagery is all one can get for one's money. And you may tell these folks that their verdict is based on perjured evidence and promise to prove to them in your own home that their verdict is wrong, but it is an enormous task. Besides, the fans of the nation can not undertake any such socialized salesmanship to atone for the crimes of dealers who are foisting this fallacy upon untold thousands. Of 21,000,000 homes in the United States, only 3,500,000 are equipped with radio. While we may be proud of the great growth in three short years we must not forget that radio is now a well-perfected industry, that it is a science of such popular possibilities as are without parallel in history, and that it is NOT ENOUGH that only one-third of the homes should have radios. Today, right now, two-thirds should be on the favorable side, with the other third ready and willing to participate in this great source of inexpensive enjoyment and education.

Why let offending dealers with their distorting devices keep up their pinchpenny yet unintentional propaganda against radio? Make them do radio a good turn. If they have not the brains to do so, lend them your brains. If there is a dealer whose offenses have come to your ears, report him. Write to Trade Editor, RADIO WORLD, 1493 Broadway, New York City, and steps will be taken at once to remedy the deplorable condition.

**He must use a non-distorting amplifier or get out of the game.**



# THE RADIO SHOW

(Concluded from page 11)

grams from London, Paris and Berlin may be easily heard in America are being carefully considered. When such a plan is put into practice the value of broadcasting will be greatly increased and one more link of friendship and understanding will be forged between the Old World and the New."

He pointed out that it will soon be possible to carry on two-way telephone conversation between a passenger on board a ship in midocean and any point on land where an ordinary telephone is available. "At present," he went on, "transoceanic as well as marine radio messages are dispatched by means of telegraph code signals, but the transoceanic radio telephone, now under development, through the joint efforts of the American Telephone and Telegraph Company and the Radio Corporation of America, bids us to expect that before many years it will be possible and convenient for any one of us to pick up his telephone and in a short time be connected with his party in Europe or with his stateroom on some liner in midocean."

## RADIO SETS FOR THE BLIND

THE American Radio Association has started a campaign for funds for equipping all homes of blind persons with radio. Radio fans are asked to contribute toward the fund through local newspapers or directly to the American Foundation for the Blind, 41 Union Square, New York City. Old sets and spare parts are not desired, as it is believed best to purchase new equipment, which will be done with the approval of an advisory committee on which government radio experts will be represented.

# S-U-P-E-R-D-Y-N-E Specialists

WE ARE HELPING HUNDREDS OF FANS IN THE SATISFACTORY CONSTRUCTION AND OPERATION OF THE SUPERDYNE, so successfully featured by RADIO WORLD

WE CAN HELP YOU!

READ OUR GUARANTEE

- OUR OWN COILS FOR SUPERDYNE \$6.50  
Our engineers have developed the coils for this circuit to its highest perfection. Coils for superdyne (complete with diagram). (Note—These Coils have been developed by and are distributed solely through us and should not be confused with inferior coils.)
- SUPERDYNE KITS \$18.00  
Kits consisting of two Flowelling Condensers and complete set of coils (with diagram) SPECIAL PRICE FOR THE MONTH OF NOVEMBER
- COMPLETE PARTS FOR SUPERDYNE \$55.00  
Easily recognized as the products of leading manufacturers assembled on engraved Radion front panel, and base panel with necessary bus bar ready to wire (technical and schematic diagram furnished). Schematic diagram drawn to actual size in minutest detail showing wiring above and below base panel. Using this diagram you can build a set equal to the best expert, particularly as to appearance and results. Contrary to usual practice, all parts included in this kit are the very best quality on the market, and workmanship first class.

**GUARANTEE**

We guarantee everything you buy from us to be satisfactory to you in every detail.

You take no risk whatever in sending us your order, for unless you are completely satisfied with the article you may return anything you buy from us within 10 days and we will promptly refund your money.

We want you to know the kind of a house you are trading with. We want you to know our principles of honest dealing and honest merchandise.

Wallace Radio Company for Good Standard Radio Equipment at reasonable prices with service—that means something.

**WALLACE RADIO COMPANY, INC.**

Complete Parts for RADIO WORLD'S Superdyne in this issue.

### HEADQUARTERS FOR

**RADIOLA**  
RADIOLA SUPER VIII.  
SUPER-HETERODYNES  
REGENOFLEX  
RADIOLA X  
RADIOLA IIIA  
RADIOLA III  
FULL LINE IN STOCK

**De FOREST**  
D-12 Wonder Loop \$136  
Set .....

De Forest Tubes —  
the tube which made  
Radio what it is.

**AMRAD**  
Inductrol Cabinet  
Jewel  
The Supreme of  
Induction Tuned Radio  
Amrad "S" Tubes  
Marathon Condensers  
Amrad Low Loss Basket Ball  
Varlometer Covers Entire  
Broadcast Range.

## WALLACE RADIO COMPANY, Inc.

135 LIBERTY STREET

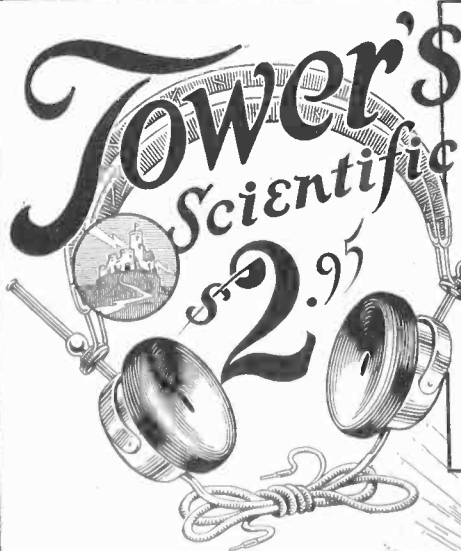
NEW YORK

WE CAN SUPPLY ANYTHING IN RADIO

RESULTS GUARANTEED MAIL ORDERS FILLED

RADIO TELEG. & TELEPHONE RECEIVERS FOR BEGINNERS—Mailed on receipt of 75c. The Columbia Print, 1493 Broadway, N. Y. C.

"ADDING ONE STAGE OF AF" explained in Radio World, issue of Oct. 18. Send 15 cents. Radio World, 1493 Broadway, N. Y. C.



## AIN'T WE GOT FUN!

Tower's Scientifics bring joy and happiness into more than a million homes every day. All the quality of phones selling at much higher prices.

Only Government Licensed Radio Operators are allowed to test and approve TOWER'S Scientific Headsets, thus guaranteeing uniform tone quality.

If your dealer cannot supply you, order direct by post card, and we will ship immediately Parcel Post, C. O. D., plus a few cents postage.

**THE TOWER MFG. CORP.** WORLD'S GREATEST  
98 BROOKLINE AVE. HEADSET  
Dept. B BOSTON, MASS. VALUE



# MR. DX HOUND

A Character Created  
by RADIO WORLD Artist

By HAL SINCLAIR



## The Radio Trade

### \$67,000 Summer Export Drop Explained

WASHINGTON.

WHILE it is acknowledged that the manufacture and sale of radio apparatus this summer far exceeded that of any previous similar period, it is a curious fact that exports of radio apparatus during the summer months this year were around \$67,000 less than those of last year.

However, the fact that radio exports were larger last summer than this was due to a large shipment to Sweden, amounting to \$443,599, during July, 1923. This figure established a high record for shipments of radio apparatus to any one country during a single month which has never been beaten.

Here are the exports for the summer months of 1924 compared to those of 1923:

| 1924 | Pounds    | Value     | 1923 | Pounds    | Value     |
|------|-----------|-----------|------|-----------|-----------|
| June | ..164,589 | \$307,884 | June | ..102,660 | \$223,589 |
| July | ..160,993 | 297,586   | July | ..618,512 | 682,885   |
| Aug. | ..291,229 | 541,238   | Aug. | ..141,564 | 307,127   |

Total. 616,811 \$1,146,708 Total. 862,736 \$1,213,601

### Wisconsin Dealers Adopt Rules

MILWAUKEE.

THE following is an extract of the rules adopted by the Wisconsin Radio Association, applicable to dealers:

1. No radio receiver sent out on approval except on payment of a delivery charge of \$10 and purchase of antenna equipment if needed. Delivery charge will be refunded if receiver is purchased.
2. Sets on approval will be considered sold if not returned within three days. Antenna equipment is not returnable.
3. Any material on trial not returned in good condition must be paid for.
4. A charge of 1 per cent. per month is made on all time payment sales. One-third of the total price must be paid in cash.
5. No free instruction service on receivers after thirty days. Any service after that period will be charged for at \$1.50 per hour and expenses; minimum charge 75 cents.
6. All batteries and tubes are tested before delivery. No exchange will be made except for manufacturing defects and after factory inspection.
7. Extra charge of special testing of tubes to meet exacting specifications, \$1 per tube.
8. Don't ask us for discounts. Our goods and our service are worth the price we ask.
9. No radio merchandise is returnable for credit.

### Co-operative Corporation Formed in New York

RADIO OWNERS, INC., has been formed as "The Fans' Own Company," incorporated in New York with \$2,000,000 shares of preferred stock, to be issued to the customers by the Liberty National Bank. Clarence Worden, vice-president of the company, said:

"We have an organization which will ultimately be owned by the radio fans themselves. We decided that the great need of the potential fans was a company which would share its profits with its customers. Accordingly we worked out a plan whereby each customer of Radio Owners, Inc., will receive one share of preferred, non-assessable dividend-paying stock in the company

with every ten-dollar purchase. We interested the Liberty National Bank of New York in the proposition and that organization made a contract with us whereby they will issue our stock to our customers upon the payment by us of \$1 in cash for every share issued. This payment is kept in a segregated fund by the Liberty National Bank, and is not available to Radio Owners, Inc., for promotion. The \$1 payment against every share of stock issued belongs to the stock and gives it a par value of \$1 at once. Any standard receiver on the market can be purchased at standard prices. The stock offer applies to any purchase. A \$100 purchase entitles the purchaser to 10 shares of stock."

Most of the business is being done through the mails, but a showroom has been equipped for the New York fans at the company's offices, 331 Madison Avenue. The officers are: E. Lester Barnes, president; Frederick R. Mather, vice-president; Clarence Worden, vice-president; Edward B. Kelly, treasurer; Harry R. Perley, secretary; E. Lester Barnes, Jacob I. Goodstein, Edward B. Kelly, Edward Staats Luther, Frederick R. Mather, Ralph K. Wadsworth, Clarence Worden, directors.

### Coming Events

- NOV. 17-22—Buffalo Radio Show.
- NOV. 18-22—Chicago Radio Fair. They advertise "all space sold."
- NOV. 24 TO 30, INCLUSIVE—International Radio Week.
- DEC. 1-7—Newark Radio Fair.
- DEC. 1 TO 8, INCLUSIVE—Boston Radio Exposition, Mechanics Building, Boston.

### S. HAMMER RADIO CO.

303 Atkins Ave., Brooklyn, N. Y.  
Please send me FREE, Your NEW RADIO CATALOG

Name .....  
Address .....  
City ..... State .....  
FILL OUT AND MAIL

### Business Opportunities Radio and Electrical

Rates: 40c a line; Minimum, 3 lines.

SALES RIGHTS on radio log can be purchased. Box A1, Radio World.

ELECTRICAL AND MACHINE work wanted; models and special machines completely constructed; also light drilling, assembling. Leo F. Robertson, Inc., 540 West 22nd St., N. Y. C. Watkins 8563.

RADIO MANUFACTURER—Low-loss condenser, seeking national distribution, desires to communicate with reputable jobbers or distributors. Box A2, Radio World.

INVENTORS—Have your models made at Herman's. 64 Lafayette St., N. Y. C. Phone Franklin 1485.

RADIO—Established business, located on Broadway, Washington Heights, for sale; low for cash. Address Gatens, 290 Broadway, N. Y. C.

CRAM'S LATEST SHEET MAP in 3 colors, flat in tube, 35c, with log 40c. The Columbia Print, 1493 Broadway, N. Y. C.

## HARP TUBES \$1.50

6 Volt, 1/4 Amp. Detector  
Regular price \$3.75  
Every tube guaranteed new and perfect.

6 V. AMPLIFIER \$1.75

Royal Mfg. Co.  
200 BROADWAY  
Dept. 3, cor. Fulton St., N. Y.

There's CONSTANT SATISFACTION in CONSTANT SERVICE

## PETER J. CONSTANT, Inc.

91 SEVENTH AVE., NEW YORK CITY  
~ CHELSEA 0665 ~

Exclusive Distributors for HANSEN "BIRD-CAGE" RADIO SETS  
Featuring for the First Time

GOLDFINCH 5 TUBE.....\$75.00  
Bobolink, 2 Tube Set.....\$25.00  
Nightingale, 4 Tube, Series II.....\$32.50  
Nightingale, 4 Tube, Series III.....\$37.50

and Other Unique Receivers  
MURDOCK NEUTRODYNE—DONEYUE ADAPTO CONSOLE RADIO CABINETS

DEALERS, the "Bird-Cage" is a high grade and profitable line, selling at prices that bring radio within the reach of every home.

STANDARD nationally advertised radio merchandise always on hand.

## RADIO Buyers' GUIDE

For Consumers Get it now—before you buy any set or parts to build one. It's yours in all kinds of complete Sets, Parts and Accessories! (Will you be so kind as to add the name of one or more friends you believe will soon want radio goods? Thank you!)

100 Pages sent FREE your name.

Liberty M. O. House, Dept. U-681 106 Liberty St., N. Y.

## - RADIO - TUBES REPAIRED

SAME AS NEW  
NO DELAY - ALL TUBES \$2.25

MACHINE TESTED AND CERTIFIED TYPE OF TUBES EXCHANGED 25' EXTRA MAIL ORDERS SHIPPED PARCEL POST LOD ALL REPAIRS GUARANTEED HIGHLAND RADIO CO.

PHONE MONROSE 2030—HIGHLAND BLDG. PITTSBURGH, PA.

### Arcoe Hydrometer

AN excellent hydrometer is marketed by the Arcoe Thermometer Co., 250 Fifth Avenue, New York City, manufacturers and importers of technical instruments of precision. An outstanding feature of this hydrometer is the three-colored, easily-read float, reading half charge, full charge and dead battery, making it as easy for the novice to get accurate battery reading as for the professional. This float also has four prongs on top and four prongs or feet on bottom to prevent its sticking to sides of the glass tube, which insures absolute accuracy. Tested

for durability, this hydrometer stood the severest tests for rough usage as the bulb and spout are of the heaviest reinforced rubber, the glass tube also being protected by a casing of rubber.  
(Tested and approved by RADIO WORLD)

politan territory, and reaching out into New Jersey as well as the New England states. They are now representing Heteroplex Mfg. Co., Gardner & Hepburn, Inc., Peak Products, C. & C. Midget Receiver and Electron Tubes.

### WM. N. CLEVERLY GOES INTO BUSINESS FOR HIMSELF

WILLIAM N. CLEVERLY, formerly sales manager of Electrad, Inc., and Gerson R. Cross, sales manager of the Burton Specialties Co., have organized a factory sales agency with offices at 321 Broadway, New York City, to cover the Metro-

### FREE! Complete RADIO CATALOG FREE!

Just send your name. No postage. Let us surprise you with our amazing values of all the up-to-date radio apparatus.

WE specialize in all COCKADAY hook-ups. Our kits are made up of the parts exactly as specified by Mr. Cockaday. We carry in stock the Cockaday Improved four-circuit tuner with resistance coupled amplifier, one, three and five tube kits.

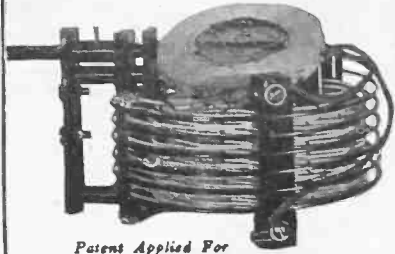
Also Super-Heterodyne, Neutrodyne, Reinartz, Vra, Asmo, Rolles and other circuits.

Complete Parts for RADIO WORLD'S SUPERDYNE KITS

Wholesale Radio Service Co.  
9 Church St., Dept. R.W., New York City

BRAINARD FOOTE, noted radio authority, describes his favorite receiver in Radio World, issue of Oct. 18. One stage of impedance RF, one transformer RF stage, crystal detector and two audio stages. Four tubes. Great quality set. Send 15 cents for copy of issue or start subscription with that number. Radio World, 1493 Broadway, N. Y.

### LOW-LOSS TUNERS



Patent Applied For

The Globe Low-Loss Tuner is designed to give maximum efficiency. All metal parts entirely eliminated. Less than 1 1/2 ozs. of insulating material. Anti-capacity windings. Suitable for use in all standard hook-ups. Special unit for the SUPERDYNE circuit.

PRICES:  
Standard Tuner (Broadcast Range)...\$7.00  
Short Wave (70-250 Meters).....\$7.00  
For Superdyne Circuit .....\$8.50

Circular on request.  
Dealers and jobbers write.

Globe Radio Equipment Co.  
Distributing Division:  
162 West 34th Street, New York City

### The New Type 54

# Sleeper MONOTROL

Reg. U. S. Pat. Off.

### Grimes Inverse Duplex System

The only set that has 3 stages of tuned radio frequency ON ONE TUNING DIAL.

23 Other Important Improvements.

Write for booklet "W." It's FREE.

### SLEEPER RADIO CORPORATION

434 Washington Street Long Island City, N. Y.

# FRESHMAN MASTERPIECE

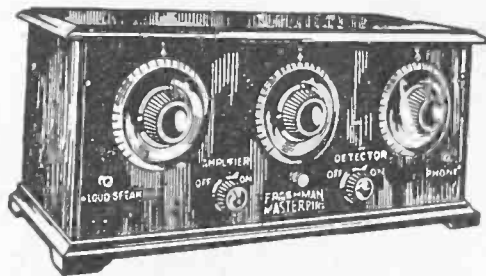
YOU CAN USE

## DRY BATTERY TUBES

equally as well as storage battery tubes because the FRESHMAN MASTERPIECE is balanced within itself and

Does Not Require Neutralizing or Balancing Condensers

We have made the great discovery that U. V. 199 and other dry battery tubes give practically the same marvelous results as are obtained with storage battery tubes.



No Distortion—No Squealing

Real enjoyable radio with plenty of volume and great distance.

The Greatest Value Ever Offered



A 5-tube tuned radio frequency set, costing only sixty dollars,

that is the equal, if not the superior, to any 5-tube set in existence, regardless of price. Not only the simplest set in the world to operate, but so selective that stations once logged can be brought in night after night at the same dial settings.

All genuine Freshman Masterpiece Sets have a serial number and trademark riveted on the sub-panel. The Receiver is not guaranteed if number has been removed or tampered with.

CHAS. FRESHMAN CO., INC., 106 Seventh Ave., New York



## Metallic DURHAM Grid Leaks

Fixed or Variable

### Grid Leaks

At dealers or postpaid

#### Prices

Fixed Metallics

Over 1/4 meg. 50c

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DURHAM & CO., Inc.  
1936 Market St., Philadelphia

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# How the Volume Set Is Tuned

(Continued from page 9)

ground, which goes direct to the plate. If the connections are reversed, so that the ground goes to the mid-point of the variometer and the grid return is direct to the plate, the set will not work.

The variable condenser in Fig. 1 therefore tunes the aerial in conjunction with the plate and the ground. The grid return short-circuits the radio-frequency currents in half

- LIST OF PARTS**
- One 7x12 in. radion panel.
  - One cabinet to match.
  - One 6½x11 in. baseboard.
  - Two 4 in. dials.
  - One 12 type tube.
  - One socket to match.
  - One 1½-volt dry cell.
  - One 6-ohm rheostat.
  - One 45-volt B battery.
  - One single-circuit jack.
  - One terminal strip.
  - One .0005 mfd. variable condenser.
  - One 50-turn honeycomb coil.
  - 100 feet of braided enamelled aerial wire, 50 feet of No. 14 insulated lead-in wire, woodscrews, solder, hardware.

the variometer, hence the regeneration is approximately cut in half, and no squealing, howling or whistles will be heard. The set virtually does not radiate at all. The variometer, too, is tuning the ground and aerial in conjunction with the plate. As the aerial goes direct to grid, the best system for getting strongest signals, and the grid return is to the plate, the best return for greatest volume, the net result is wonderful volume.

**Wiring Directions**

1. Connect the A+direct from battery to the F+post of the socket. Join the A—post of the battery to one side of the rheostat, the other side of the rheostat going to the F—post of the socket. Connect the A+ and B—. That completes the battery wiring.
2. Connect the aerial (a) to the beginning of the primary coil, L1, (b) to the stator plates of the variable condenser C1 and (c) to the grid condenser, the other side of which goes to the grid post of the socket. If a honeycomb or duolateral coil is used the beginning may be distinguished as that lead which emerges from under the winding. Connect the end of L1 (a) to the rotor plates of C1, and (b) to the tap on the variometer. The ground is connected directly to the plate. The remaining unconnected lead of the variometer goes to one side of the jack S and the other side of the jack goes to B+22½ volts. Higher B battery voltage should be tried. The part of the variometer to which ground is connected is beginning of the stator. That part between

the grid return and the phone is the rotor. Either by examining your variometer or by reversing these end connections of the variometer you will arrive at the correct order.

## If Your Neut Won't "Neut"

Here's the missing link. Uses same panel, same layout, same (but fewer) parts. Selective, deep, resonant volume from "Coast to Coast." Hundreds have bought this kit—nary a kick, but scores of enthusiastic testimonials. For \$5.00 we will send prepaid the only extra part, 22 feet gold sheathed bus wire, lithographed circuit and complete, simple instructions, with unlimited privilege of mail consultation. Nothing else to buy. Satisfaction guaranteed. Data about circuit—10c. 48 page radio catalog—2c. Stamps taken same as cash.

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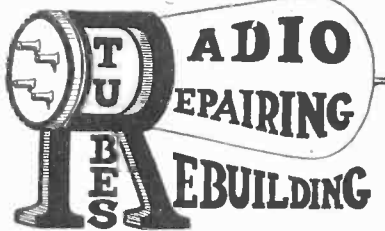
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Kodak Receivers, completely wired, in cabinet. Picks up stations 1,000 miles away on one tube and no antenna. When conditions are right. Add tubes and increase distance and volume to 3,000 miles on loud speaker. Operates on storage or dry batteries—

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# 3 Big Cities Prove Obstacles to Wavelength Solution

## Boston Wants Two Exclusive Waves

WASHINGTON.

IN the big cities the radio supervisors of the Department of Commerce are having their chief wavelength troubles with stations, exclusive wavelengths being demanded for the city as a whole. This adds a new complication to the settlement of the wavelength difficulty. Boston, for instance, wants two exclusive channels, and Secretary Hoover has received 3,000 telegrams from Boston fans backing up the idea. They want to make Boston safe for non-interference.

Boston is in the First District, comprising New England, and it has two stations, both in Class B. They are WNAC, operated by Shepard Stores, and now 278 meters, and WEEL, operated by the Boston Edison Co., now 303 meters. But there are Class B stations also in South Dartmouth, Mass.; Springfield, Mass.; Hartford, Conn., and Providence, R. I., the last named having two. That makes seven Class B stations for the district.

Another difficulty exists in the Second District, which includes New York City and its environs, where eleven B stations are situated. Two more are proposed in New York; one for the Freed-Eisemann Co., the other a hotel. Now the second district has five wavelengths, and may get six. But the distribution on a basis of equity and efficient service is a problem which is vexing Supervisor E. A. Beane as well as the department. Chicago has nearly as many Class B stations as New York, and a satisfactory distribution there, with the necessary time splitting is causing delays.

On the Pacific Coast fewer difficulties are arising. The Northwest is satisfied.

**RADIO** MONEY SAVING CATALOG SENT FREE  
**TIMES SQUARE AUTO SUPPLY CO. INC.**  
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THE TWITCHELL PRE-AMPLIFIER is a Powerful Radio Frequency Amplifier attachable to any make of receiving set. It brings in many distant stations which you cannot hear without it. Brings in with tremendous volume those you now hear only faintly. Make your set selective. Prevents re-radiation.

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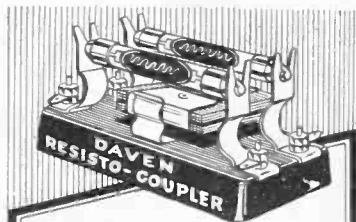
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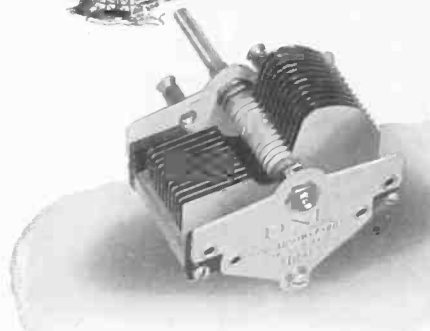
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Opinions do not answer, facts do. That is why you cannot afford to borrow the jaundiced ideas of your neighbor when choosing your condenser. Buy a D. X. L. and save being disappointed. This condenser is a straight-line-low-loss type designed especially for super Heterodyne and all super sensitive sets. With grounded rotor plates of brass construction and aluminum end plates. Body capacity entirely eliminated. Approved by the University of Michigan and found absolutely accurate with the U. S. Bureau of Standards.

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WHAT is the best radio joke you ever heard? For the one best joke submitted RADIO WORLD will pay \$25.

The test closes November 25. Your submission must be received at our office by that time. The judges will be S. A. Rothafel, (Roxy), WEA, New York City; Ben Garetson, station director, WGN, Chicago; N. T. Granlund, station director, WHN, New York City; Arthur T. Nelson, Commissioner, State Marketing Bu-

reau, WOS, Jefferson City, Mo., and George D. Hay, assistant station director, WLS, Chicago.

Send in your jokes NOW! Send in as many as you want. Be sure to write only on one side of the paper and to give your name and address. Send jokes to Best Joke Editor, RADIO WORLD, 1493 Broadway, New York City.

The judges will decide the winner. As it is possible several readers will submit

the same joke, the one having his joke published first will be entitled to it as his or her entry.

## Keep Your Set Clean

A CLEAN joint isn't always a good connection. A ground connection, for instance, on a freshly painted water-pipe is certainly clean, but far from a good electrical connection. The pipe must be scraped until the metal shines, and a firm connection made by means of a ground clamp.

Always solder the lead-in connection from the aerial. If this isn't done the weather will soon corrode it, placing a film of insulation over it that chokes the feeble energies that the aerial collects. If soldering is impossible the next best thing is to tin-foil the connection well, then taping, so that the air is excluded.

Cleanliness is synonymous with satisfaction in radio reception. Keep your set clean, and the results will be as efficient as the circuit allows.



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If there is only one pair of ear phones for the crystal set and the family is large, keep the key in your vest pocket.

\* \* \*

If a neighbor's aerial is so close to yours as to impair your re-

## Right of the Landlord to Prohibit Aerial Puzzles Court

MRS. GRACE W. PARKS, owner of the apartment house at 28 Argyle Road, Brooklyn, N. Y., in Flathush Court answered a complaint by one of her tenants, Maurice B. Lieberman, who charged her with destroying his radio aerial, which he had erected on the roof of the house. Mrs. Parks had announced to Lieberman that she would remove any other aerial fixture he may put up on the roof of her property.

The question of the right of tenants to put up aerials against the wishes of landlords may carry this case to the higher courts for a final decision, as Magistrate O'Neill pronounced it without precedent.

Lieberman, who got a summons for Mrs. Parks after he had consulted District Attorney Dodd, said there were thirty-seven aerials on the roof of Mrs. Parks's house which she had left undisturbed when she chopped his down. Lieberman contended that a decision he got in a Municipal Court to prevent Mrs. Parks raising his rent may account for the fate of his aerial. Milton Herz, attorney for Mrs. Parks, said he had advised her to remove all the aerials of tenants.

14 B. & S. gauge, in case he should happen to catch you.

\* \* \*

If your set won't work, denounce it for the lazy thing it is.

\* \* \*

She'll appreciate a crystal set—in platinum.

THOUSANDS OF BARGAINS  
FACTORY GUARANTEED MDSE. BY MAIL  
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BE SURE IT'S A GENUINE SUPERTRON  
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**The One Best Circuit FOR 199 TUBES \$1.00**  
Super Selective—DX—Great Volume  
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**THE FIXED DETECTOR MARVEL**  
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Note the difference.  
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ception, do not cut down his aerial with any shears less than number

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| Amertran Transformer .....                         | 5.45    |
| Thordarson Transformer 3-1.....                    | 3.25    |
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**RADIO GIFTS NUMBER**  
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Issued at a time when the American Radio Buying Public is spending its money lavishly for radio gifts. RADIO WORLD'S HOLIDAY GIFTS NUMBER will have a list of notable contributors, a special Holiday Cover in colors, and many special features, and will have a larger sale than usual, as there will be no advance in the price per copy.  
A really great advertising medium for those having anything to sell to RADIO WORLD'S tremendous army of readers throughout the North American continent.  
For Special Positions, Wire or Phone Immediately  
Advertising Manager, Radio World, 1493 Broadway, N. Y. C.  
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# How Set Is Reflexed for AF

(Concluded from page 7)  
windings for this distance are side by side and are wound with one motion, in and out of succeeding arms. Continue winding the secondary alone until within 5" of the end, then loop as before. Now, using linen

### LIST OF PARTS

- 1/2 lb. No. 22 double cotton covered wire.
- Two low-loss D. X. L. variable condensers, each .0005 mfd., normally 23 plates. Vernier not necessary. (C1 and C4.)
- Two audio-frequency transformers, Federal No. 65. (AFT.)
- Two 12 type tubes.
- Two sockets to match.
- Two 6-ohm rheostats.
- Two 1 1/2-volt dry cells, to be connected minus to minus and plus to plus.
- Two Freshman fixed condensers, each .001 mfd (C2 and C3).
- Two 45-volt Eveready B batteries, to be connected minus to plus.
- One single-circuit jack.
- One Ambrose Vernier crystal detector. (D).
- One 7x18" panel.
- One cabinet to match.
- One 7x16" baseboard.
- One loud speaker.
- 100 feet Talking Tape for aerial, 50 feet No. 14 insulated lead-in wire, solder, screws, hardware.

thread, cut 18 lengths, 5" long. Thread two lengths through the winding, where a spoke is, one length to be looped around the winding to one side and the other looped to the other side. Tighten each of the two tie-strings and knot at the circumference of the winding. The reason for using two pieces of string at each of the nine points where the arms are will become obvious as you make the coil. After all the tie-strings are attached the form may be cut away, leaving the coil a low-loss, self-supporting inductance.

Repeat the operation to make the second RFT. The terminals of the primaries are readily distinguishable from those of the secondaries, for the beginning of the primary is about 3/4" from the inside of the coil and the end is about in the middle of the coil, whereas the secondary terminals are at the external circumference. Also, the beginnings are those terminals of both coils nearer the center, the ends being nearer the outer circumference.

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The reflexing of the first RF stage is easy. The output of the detector, which without any audio amplification would go to the phones, goes instead to the primary of the first audio transformer. These leads are one side of the crystal and the end of the secondary coil L4 whose beginning goes to the other side of the crystal. Now, as with AFT circuits, the G post or S1 goes to the

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This circuit may be logged. Tuning is very simple.

### Make \$100 Weekly-sell RADIO

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"Popular Wherever Radio Is Used"

14 Sizes in Beautiful Display Case

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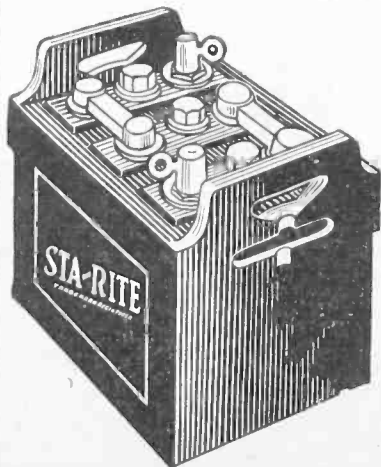
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is crammed with thousands of wonderful radio bargains. That's why we GUARANTEE to save you money.

Write for your FREE copy today!



## New Station Soon in Oklahoma

OKLAHOMA CITY.

RADIO fans soon will be tuning in a new 500-watt station from Oklahoma the Etherical Radio Company, of Bristow, announced. The station is expected to be on the air sometime in December, E. H. Rolleston, president of the company stated. The exact location of the station is yet unsettled.



**Save 1/2 Cost of New Tube**

**Guaranteed Vacuum Tube Repairs at Popular Prices**

We try to maintain 24-hour service.  
All repairs guaranteed.  
Tubes satisfactory or money refunded.  
Special discounts to dealers.  
Send broken and burned out tubes parcel post.  
Repaired tubes returned parcel post, C.O.D.

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30. BOSTON, MASS.

TUBES at One-Half Cost

## New York has 12 Stations; Philadelphia Second With Total of 11

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| St. Louis         | 5       | 1       | 2       | 8     |
| New Orleans       | 8       | 0       | 0       | 8     |
| Denver            | 7       | 0       | 0       | 7     |
| Minneapolis       | 4       | 1       | 0       | 5     |
| Cincinnati        | 1       | 3       | 1       | 5     |
| Pittsburgh        | 2       | 2       | 0       | 4     |
| Cleveland         | 2       | 2       | 0       | 4     |
| Salt Lake City    | 3       | 0       | 1       | 4     |
| Boston            | 3       | 1       | 0       | 4     |
| San Francisco     | 2       | 1       | 1       | 4     |
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### INCOGNITO PROGRAM TRIED

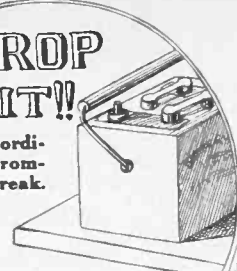
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**DROP IT!!**

And nine times out of ten the ordinary Hydrometer will break.



**ARCOE HYDROMETERS**

**Will Stand Abuse!**

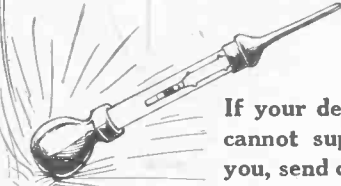
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BY MAIL ONLY  
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Postpaid

## QUARTER AMPERE AMPLIFIER-DETECTOR RADIO TUBE

### GUARANTEED SATISFACTORY

All "GOODE" Tubes Sold Direct to the Consumer—No Dealer Profits

ONE—"Goode" Detector-Amplifier... **\$2.39**

THREE—"Goode" Detector-Amplifiers... **\$6.42**

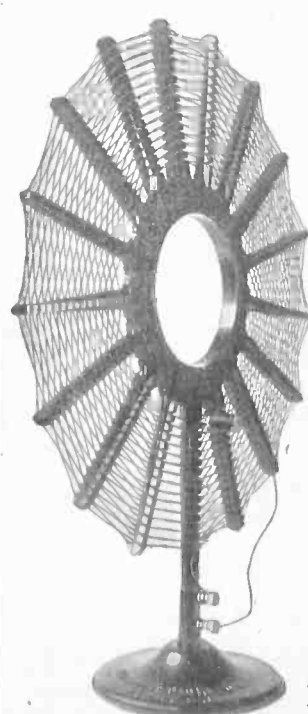
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The "Goode" Two-o-One A Tube amplifies or detects. It is a quarter ampere, five volts, standard base silvered tube.

Send express or postal money order or New York draft to—

**The Goode Tube Corporation**

Incorporated in Kentucky  
**OWENSBORO KENTUCKY**



Patent Pending

## A Marvelous New Invention

# The PARAMOUNT LOOP

Latest master-product of the Paramount Radio Corporation.

Spider-web wound with silk over phosphor-bronze wire, mounted on a genuine Bakelite frame (lowest in dielectric losses) the PARAMOUNT LOOP gathers and sends direct to the receiver every electron of current, giving, to a surprising extent:

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**Greater Receivability!**  
**Greater Directional Effect!**

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*"A Loop Eventually—Why not the Best?"*

**PARAMOUNT RADIO CORPORATION**  
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*Jobbers and Dealers, Get In On This!*

AN ALL-AROUND PORTABLE for Home or Outdoor Use, by Herbert E. Hayden. Three tubes. Send 15 cents for copy of Aug. 16 issue. Radio World, 1493 Broadway, New York City.

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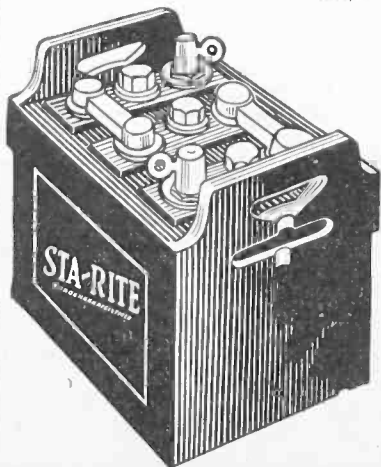
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Make big money in this new field!  
Learn quickly, at home, in spare time.  
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IN ALL RUBBER CONTAINERS

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**ARCOE**

**HYDROMETERS**

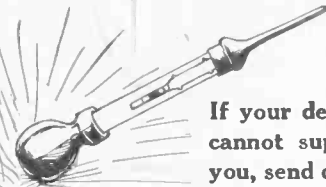
**Will Stand Abuse!**

Bulb and Spout are of heavy rubber, giving greater security in case of accident.

Combined with the easy reading float arranged in three colors, the glass studded top and bottom to prevent sticking to the sides, giving a true and accurate reading. Absolutely guaranteed to be the best in the market.

**PRICE \$1.00**

AT ALL GOOD DEALERS!



If your dealer cannot supply you, send dollar bill to

**ARCOE Thermometer Co.**

290 FIFTH AVENUE  
NEW YORK CITY

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# A

*Le Ton d'argent*

Guaranteed



BY MAIL ONLY

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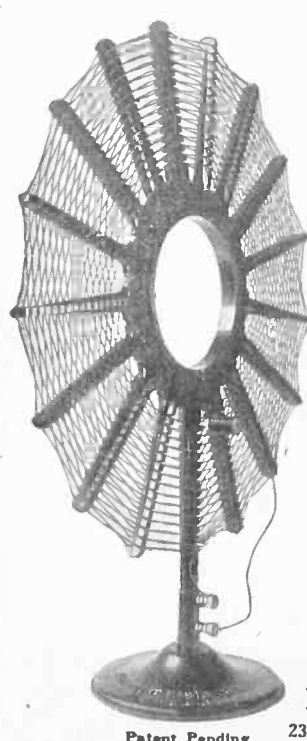
(All Postage Prepaid)

The "Goode" Two-o-One A Tube amplifies or detects. It is a quarter ampere, five volts, standard base silvered tube.

Send express or postal money order or New York draft to—

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Incorporated Dept. B  
**OWENSBORO KENTUCKY**



Patent Pending

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# 'Super-Het' Selfish with Neighbors

There is little truth in the popular belief that operation of a Super-

Heterodyne improves the reception of other receivers in the neighborhood. It is often said that the receiving range of other sets is increased when a "super" is operated in the vicinity. This belief is only natural, as the "super" is looked upon as a powerful and sensitive outfit. But a 1-tube regenerative set is capable of decidedly more improving effect than the usual eight-tube Super-Heterodyne.

So that a receiving set may increase the volume or apparent range of other sets nearby it is necessary, first of all, that the receiver amplify the initial received frequency, and, secondly, that this amplified energy be coupled in some way to the antenna system and thus increase the energy in the antenna and cause greater radiation than would be the case without the transference of amplified energy at the same frequency.

### Oscillation Not Vital

A plain regenerative set does both of these things, as the initial energy is amplified and the amplified energy is coupled, while still at the same frequency, to the antenna circuit, so the energy in the antenna is re-enforced. The receiver need not be oscillating to accomplish this, though the effect will be greater the nearer the receiver is operated to the point of maximum regeneration.

But with a Super-Heterodyne the original frequency is seldom amplified. The only radio-frequency energy present of any appreciable value is that at the frequency of the oscillator and that at the intermediate frequency. The oscillator frequency is not in tune with the receiver frequency, and in any case is not modulated; so even though energy be radiated at the oscillator frequency it will be of no advantage to nearby receivers.

### Not In Resonance

The amplified intermediate frequency is not in resonance with any of the broadcast receivers, nor even in resonance with the antenna of the super. Besides, the amplified intermediate frequency is almost completely isolated from the antenna circuit, so even if energy at the intermediate frequency were radiated, it would have a negligible effect not only as it is completely out of resonance with the super's antenna and neighboring receivers but also because the value of radiated energy would be absurdly small.

CRYSTALS successfully used as Oscillators and Amplifiers for the First Time. A two-part article, with diagrams of six hook-ups, in Radio World, issues of Aug. 9 and 16. Send 30 cents. Radio World, 1493 Broadway, New York City.

Therefore, unless regeneration is employed in the tuning section of the super, the radiation will be no greater than would be the case were all the tubes removed.

### Why No Help Is Given

And even if regeneration were used radiation would not be in excess of any regenerative 1-tube set, and possibly even less so because of the smaller antenna generally employed with the super.

Remembering that the sensitivity and amplification of a Super-Heterodyne comes after the second or third tube, and even then at a different frequency from that of either the Super-Heterodyne antenna or nearby broadcast receivers, it can be seen that this belief is unfounded.

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# U. S. Plans Suit to Compel Reflex Manufacturers to Get License

WASHINGTON.

THE courts soon may be called upon to decide who has a right to manufacture radio sets employing the reflex circuit as a result of the recent decision of the Attorney General, that the Navy Department can grant non-transferable,

revocable and non-exclusive licenses to private concerns to manufacture under seized German patents. These patents were acquired by the navy from the Alien Property Custodian who seized them from Germans when this country entered the World War. The most important of these patents, of which there were around 70, was the Schloemich-Von Bronk reflex circuit, granted Feb. 17, 1914. Experts of the Navy Department consider it the basic reflex patent. They believe all other reflex patents, even including the Harkness, to be derived from it.

The Schloemich-Von Bronk patent was purchased by the Navy Department from the Alien Property Custodian. Many requests have been received by the Secretary of the Navy from private concerns for permission to manufacture under this patent. To this end, the Secretary of the Navy asked the Attorney

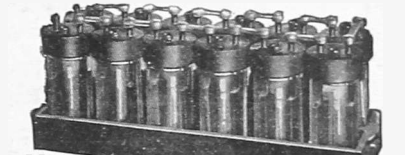
General for an opinion as to whether licenses could be granted to private concern to manufacture under it. The opinion of the Attorney General was that it could be done.

As a result, the Navy Department may undertake to compel concerns now manufacturing reflex circuits to take out licenses under the Schloemich-Von Bronk patent.

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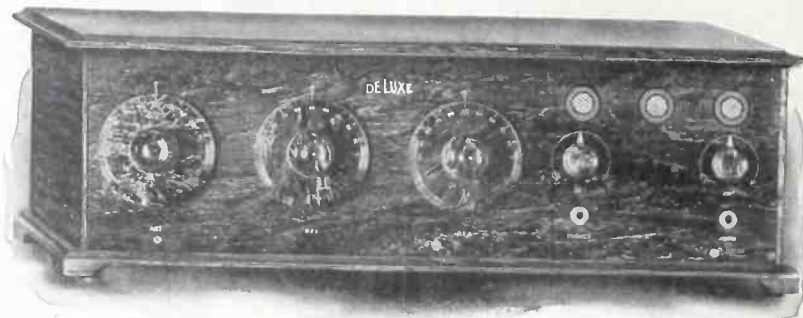
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