

A 1-TUBE, LOW-LOSS DX CIRCUIT, TOTAL COST TO BUILD, \$30

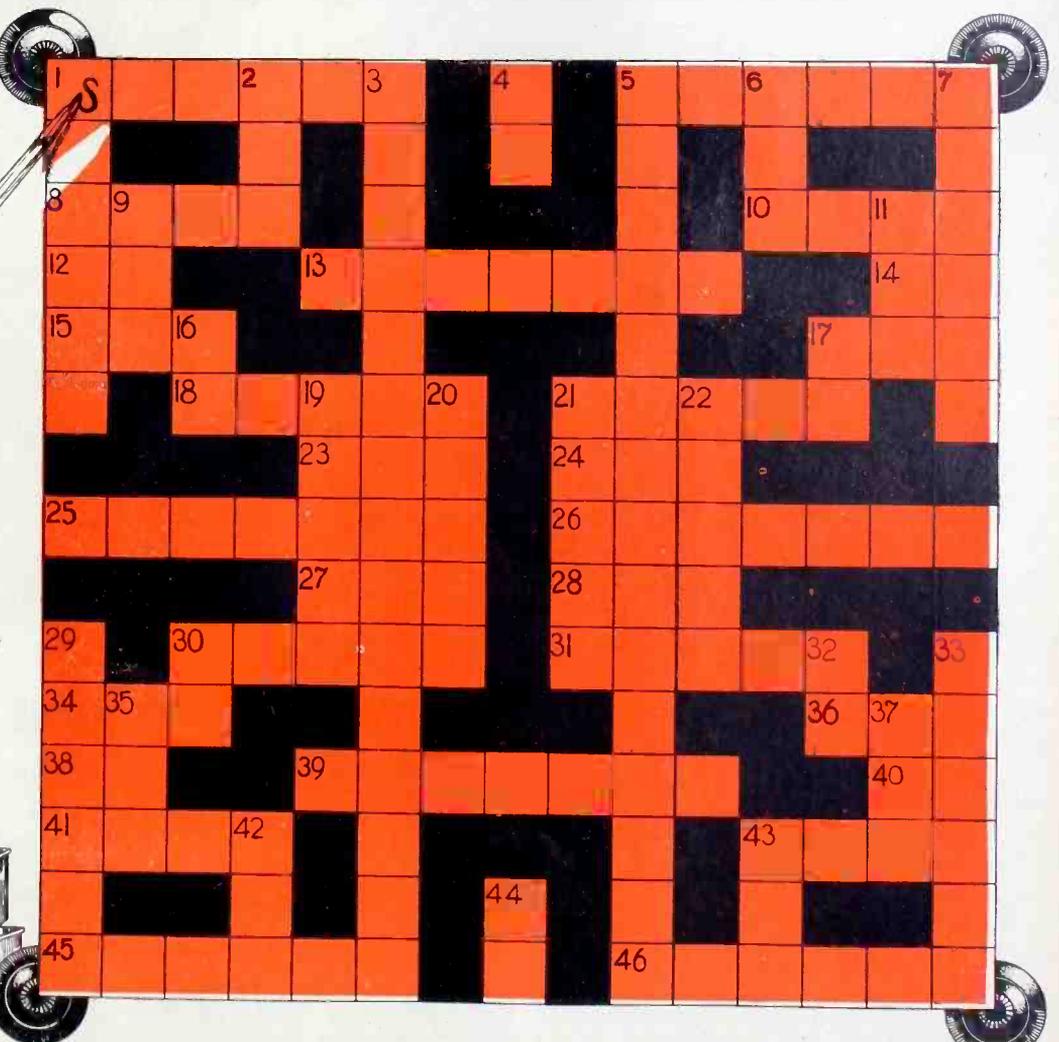
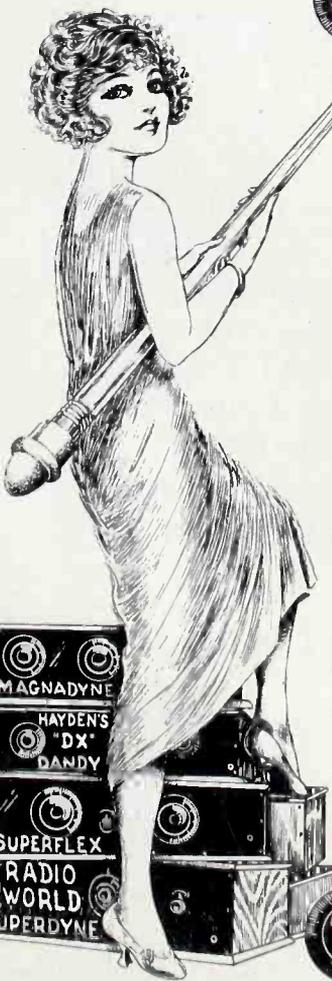
How to Wire the 4-Tube 1925 Superdyne

# RADIO WORLD

Title Reg. U. S. Pat. Off

VOL. 6. NO. 18. ILLUSTRATED EVERY WEEK

1. Tube container.
  5. Contact ends of tubes.
  8. — accumulates in the acid in the storage battery.
  10. Dielectric of a fixed condenser.
  12. Section of United States in which WNAC is located (abbrev.).
  13. Antonym of creating a vacuum in a tube.
  14. Audio transformer (abbrev.).
  15. "Much — About Nothing."
  17. Call letters of a station in San Francisco, 423 meters.
  18. The Super-Heterodyne's selectivity is as sharp as a —.
  21. One reads a diagram by the processes of the — nerve.
  23. A set that does not feed back the plate current to the grid is said to be — regenerative.
  24. Canadian Radio Operators (abbrev.).
  25. Music lovers enjoy most the pleasure afforded by a radio —.
  26. An open circuit makes a sound like the buzz of — (Synonym of wasps).
  27. Radio Magazine Editors (abbrev.).
  28. Radio Salesmen's Club (abbrev.).
  30. Five letters of a 6-letter word meaning describing the variable plates of a condenser.
  31. The broad highway of the radio.
  34. Covering on busbar.
  36. Three of call letters of a New York City station, 492 meters.
  38. Same as 14.
  39. Twice daily.
  40. For example.
  41. Object to which insulators are often attached in the suburbs.
  43. The insulation on the wire of a coil supplies the dielectric for each —.
  45. Farm duties.
  46. A crystal set usually — get DX.
- VERTICAL
1. Heard via radio; 2. Knockdown sets; 3. Voltage changes; 4. Distance; 5. Plate paralyzes; 6. Resistance unit; 7. Ether noises; 8. A color; 9. Capacity; 10. 1,000 cycles; 11. Come in; 12. Yellow; 13. For soldering; 14. Same as 7; 15. Royal Navy; 16. Radio World; 17. It makes phones work; 18. Interfrequency transformer; 19. Ever (poetical); 20. Same as 37; 21. Bind; 22. Wavelength.
- \* Abbreviations.





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interference, fine tone and consistently good results—these are the performance qualities of the *Amerex Ace*. Once a station is brought in you can always find it at the same points on the dial.

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# RADIO WORLD

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## A \$30 1-Tube Set That Gets DX Clearly

By Lieut. Peter V. O'Rourke

A SIMPLE 1-tube set that gets DX and still produces signals of good tonal quality, so that one may amply enjoy the broadcasts by opera stars and symphonic orchestras, if one is so minded, is shown in Fig. 1. This is a regenerative set with the grid coil conductively coupled to the antenna-ground. Regeneration is obtained by putting a coil in the plate circuit and tuning this coil with a variable condenser. The tuning of the plate to resonance with the grid supplies the regeneration through the internal capacities of the tube, which are just like the plates of a condenser and transfer energy.

The set can well be made for \$30, including everything, even earphones. Under tests it has brought in stations as far as 1,200 miles away, but this only occasionally and not with the best of quality. However, up to 500 miles stations came in clearly.

### Tube 11 on the Set

Dry-cell tubes work well in this circuit. The 11 or 12 type is to be preferred, as either may be operated on a single 1½-volt dry cell. The 199 and 299 tubes also function satisfactorily but it is harder to strike a tube of this type that is as good a detector. Of course the storage battery tubes will work very well.

The panel layout and assembly plan are shown in Figs. 2 and 3 and the dimensions given in those diagrams should be followed. It will be noticed that a fixed gridleak is shown. Its value is .00025 mfd. and it has clips for mounting a fixed or variable leak. How-

ever, I advise a variable leak, as previously explained, and it is also a good thing to have a variable grid condenser instead of a fixed one. As soon as the exact capacity is found, by rotating a knob on the variable grid condenser, that setting forever remains the same. To those who have not tried a variable grid condenser the improved results sometimes made possible by its inclusion will prove startling. The volume goes up considerably when the right capacity setting is found and the signals come in more clearly, too. The fixed grid condenser is usually recommended, perhaps for simplicity's sake, and because .00025 mfd. is the right capacity in nine cases out of ten. But as to that tenth case, which may be your own, the advantage is so great that the slight extra expense is well worth while from the viewpoint of insurance.

### Radiation Reduced

The radiation is reduced to a minimum by the coupling to the antenna circuit, because the outgoing or radiated waves must suffer detuning during their course into the antenna. If a station is tuned in, as it should be, by the voice or music and not by the whistle, there will be no radiation. The trick is to keep the regeneration dial setting at a point under that which causes oscillation for a given wavelength. This works all right for locals or semi-distant stations, but to get DX it is necessary with any regenerative set to tune in by the whistle. Therefore as soon as the carrier wave is caught, which is determined by the whistle in the phones, the rheostat should be lowered immediately. The station may then be tuned in accurately, yet without disturbing the neighbors.

To get DX and selectivity on a 1-tube set it is necessary to use regeneration, which is a form of radio-frequency amplification equal to 1½ or 2 stages of RF ahead of a non-regenerative detector.

The wiring diagram is shown schematically in Fig. 1 and repeated in Fig. 4 in picture form. The assembly of the set is simple, as shown in Fig. 3.

### How to Improve DX

It is highly advisable to use a variable gridleak for R3, Fig. 1, for by adjusting it when a distant station is heard the signal may be tuned in so that voice and music are heard clearly and distinctly. Otherwise mushiness may accompany the reception, and this becomes particularly annoying if two audio stages are added for loud-speaker operation. How to get the

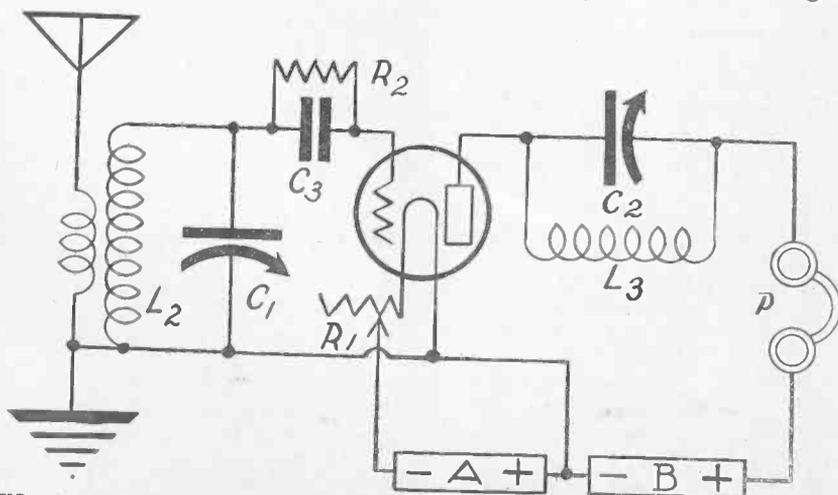


FIG. 1, schematic wiring diagram of Lieut. Peter V. O'Rourke's 1-tube DX set which may be logged and on which the tuning may even be done in step, with any given station coming in at the same dial readings for each of the two controls. Low-loss coils and condensers are used. The condensers are .0005 mfd., normally 23 plates. The arrows indicate the rotary plates of the condensers. The L1 designation fell off the aerial-ground coil. L1, L2 are really one coil, tapped. The coils are home-made.

# Picture Diagram of Wiring

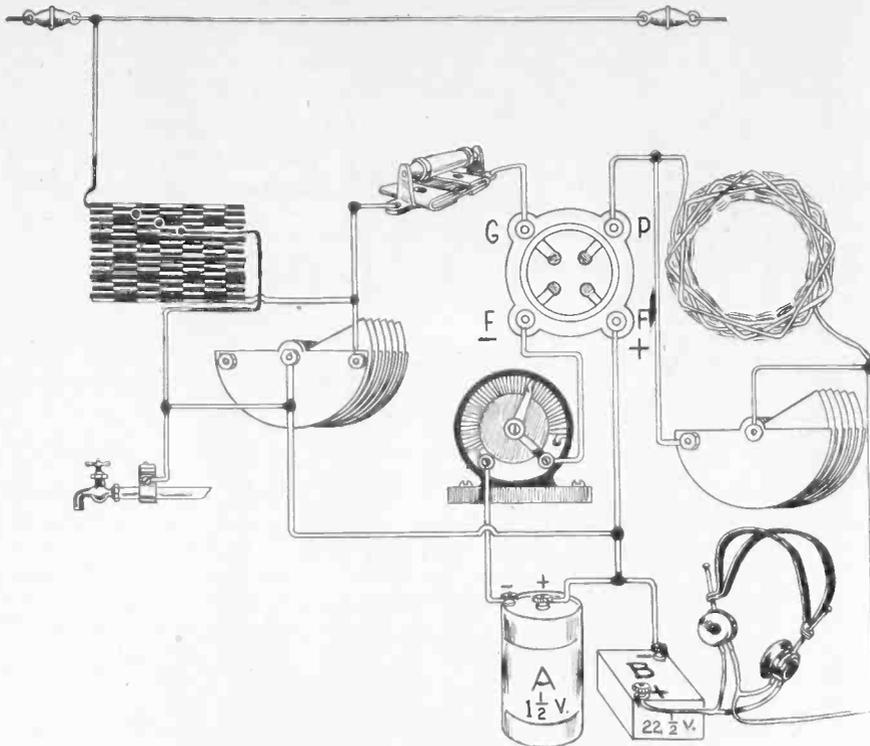


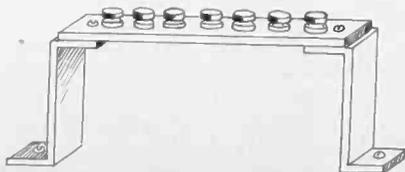
FIG. 4, wiring diagram of Lieut. O'Rourke's set shown in picture form. This diagram simply presents in another form the same wiring shown schematically in Fig. 1.

"fuzz" out of the reception then becomes a problem for the solution of which variable high resistances and the like are sometimes recommended, but the trouble lies mainly in the detector stage in these cases. Any time the detector operates clearly but the AF output is distorted attention should be paid to the AF parts and wiring, rather than extraneous parts introduced to solve an inherent difficulty that should not develop in audio stages.

## C1 Must Have Vernier

A variable condenser with vernier **MUST** be used to tune the grid coil L2. This condenser is C1 in Fig. 1 and is shown with the rotor plates (designated by the arrow) connected to the filament. This is grid return. No vernier is necessary for the other variable condenser, C2, which tunes the plate, but it sometimes helps to have vernier here, especially for those not experienced in tuning regenerative sets. Therefore anybody having a vernier condenser handy for this instrument may employ it, but those desiring to preserve every possible economical advantage without sacrificing results may safely use a plain condenser here.

As intimated, the rheostat plays an important part in this circuit. This is true in any regenerative stage. The tube oscillations may be controlled by the rheostat to a large extent, although this is not the best way. The tickler or condenser tuning the plate should be used for this purpose, except, as stated, when a DX whistle is heard, and you may want to get your set quickly stabilized for the benefit of neighbors and



DETAIL (Fig. 4) of how to mount the terminal block, using high right angles, secured to base-board.

## LIST OF PARTS

Two .0005 mfd. variable condensers (C1 must have vernier, C2 need not have vernier).

One variable grid leak (Turnit) R2.

One variable grid condenser (Amplex Grid-denser) C3.

One Fil-ko-Stat, with switch (R1). This is the rheostat.

One gridleak mounting.

½ lb. No. 20 double cotton covered wire.

One wooden base, 4x4" for accommodating dowel sticks. Two 3 ft. lengths of ¼" dowel rod.

One WD 11 or WD 12 tube.

One socket to match.

One terminal block.

One 7x14" panel.

One cabinet to match.

One pair of earphones.

Two dials (unless supplied with the condensers).

One ½-volt dry cell.

Two silver Eureka dial pointers.

One 22½-volt B battery.

Two phone-tip jacks.

100 ft. 7-strand aerial wire, 50 ft. No. 24 insulated leadin wire, six lengths of round busbar, lugs, solder, hardware.

yourself. If the set is radiating the signal quality is poor.

In the aerial-grid circuit it is important to have low-loss apparatus, both coils and condenser, although in the plate circuit this is not so important. However, in the laboratory model low-loss inductances and variable condensers were used throughout.

The form of coil used was the basket-weave. In the January 10 issue of RADIO WORLD was published an article that textually and photographically showed the details of constructing such a coil. Anybody entertaining any doubts as to the best manner to proceed in winding such a coil should refer to that number.

Use No. 20 double cotton covered wire throughout. It is better than single cotton covered wire because of the extra spacing between turns afforded by the thicker insulation. It is better than any silk-covered wire. Describe a 3" circle on a 4x4" wood block and divide that circle into fifteen equal parts. This would prove a hard job if you did not know that the straight-line distance between points is about ⅝". That is the arc subtended by the 24 degrees represented by one-fifteenth of the circumference. Drill ¼" holes to accommodate ¼" diameter dowel sticks. Several dowel rods may be purchased in 3 ft. lengths in almost any hardware store for about a quarter. They are then cut into 4" lengths and fastened in the fifteen holes. Usually pressure will make them sufficiently secure. Otherwise use glue. They should be exactly upright, to prevent making an unsightly coil.

Although two coils are shown in the aerial-grid circuit, L1, L2, (L1 is not lettered in Fig. 1) they are really one coil, tapped. Therefore wind fifteen turns in either direction most pleasant to you, make a small loop, twist the end of the loop one turn, then proceed with the winding until fifty more turns, a total of 65, are put on. It is preferable to wind "under and over two," rather than "under one, over one," for a more presentable coil results and a little more firmness, too. The coil may be secured by passing linen twine through the apertures in the coils, the length of the winding (at right angles to the direction in which you were

# The Assembly of the Set

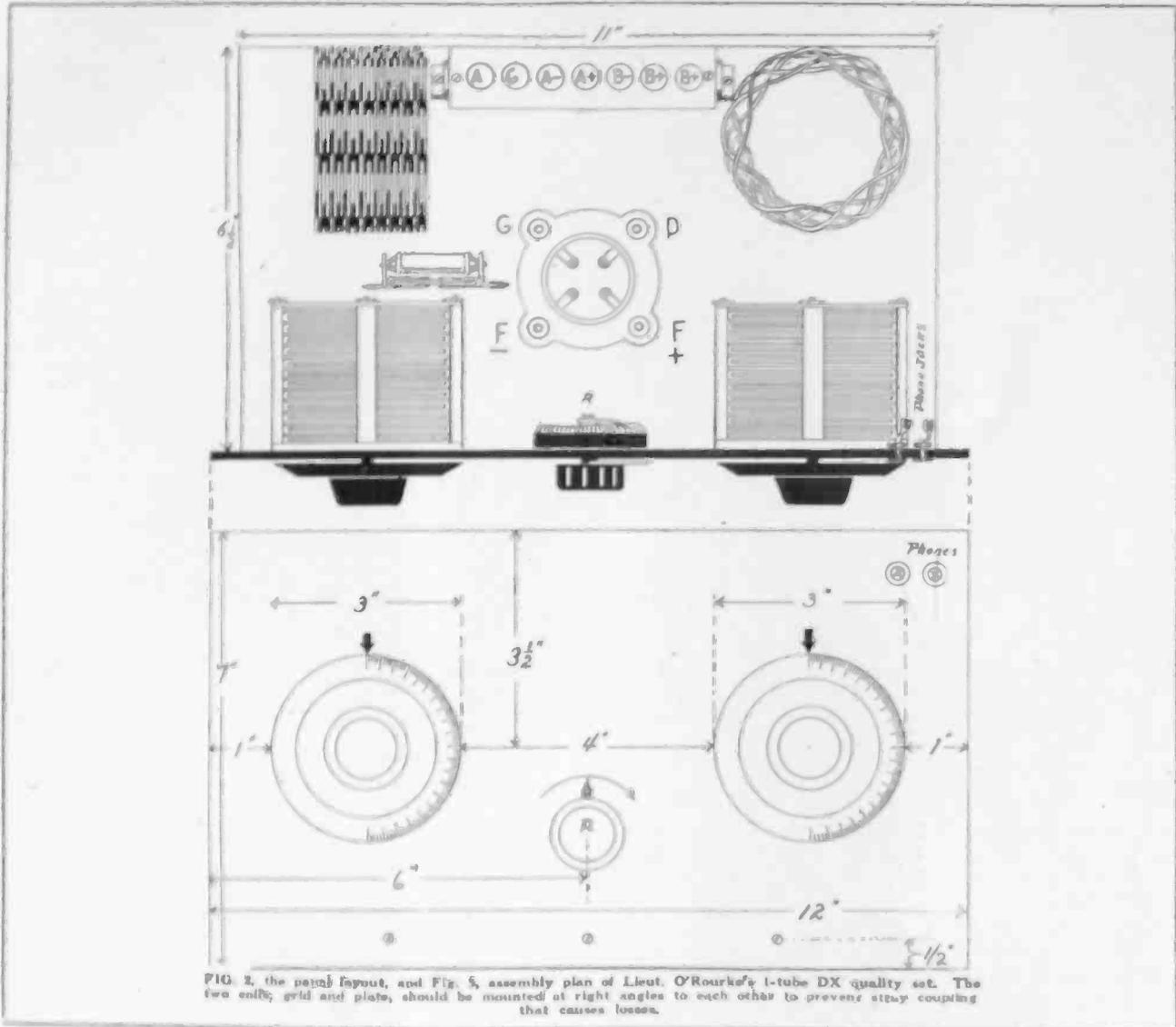


FIG. 2, the panel layout, and Fig. 3, assembly plan of Lieut. O'Rourke's 1-tube DX quality set. The two coils, grid and plate, should be mounted at right angles to each other to prevent stray coupling that causes losses.

winding the wire). The twine goes down one side, at the angle created by succeeding turns, then comes up the adjoining side, when a knot is tied. Without breaking the twine repeat this process at each of the remaining fourteen points, making 30 perpendicular stretches of twine (two at each peg), with a carry-string going around the circumference either on top or on bottom, depending on what way you were working. Obviously it is easier to put on the tie-string after removing the coil from the form, but care should be exercised in the removal process, otherwise the coil may get squashed. If the coil is lifted about 1" from the bottom, without being removed, the tie-string may be conveniently passed through the apertures and the coil removed from the form after it is secured with twine. A knitting needle facilitates passing the twine in and out.

For the plate coil a separate 35-turn coil may be used, made the same way, on the same form, with the same kind of wire.

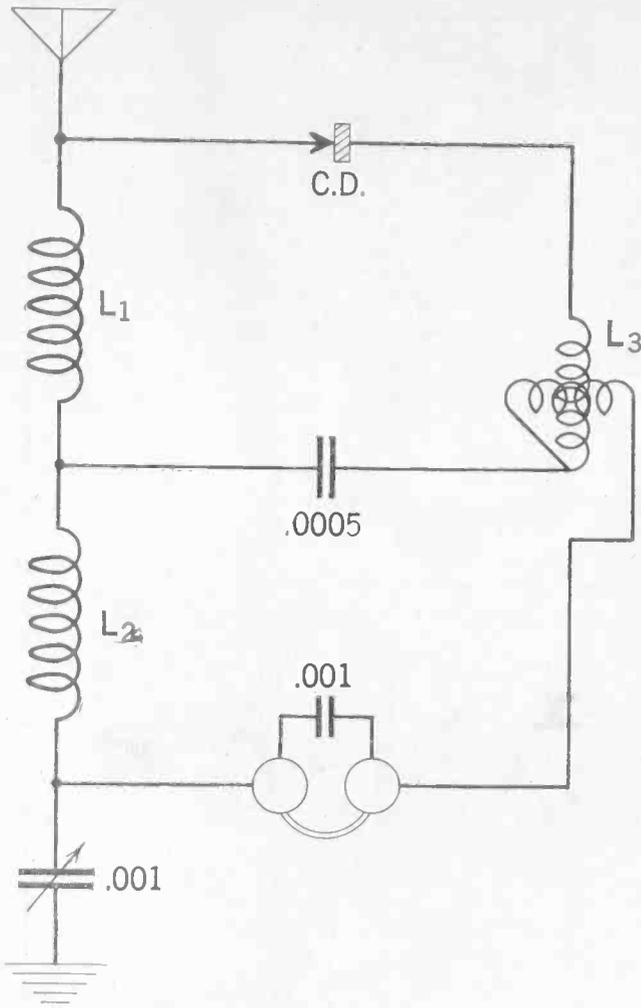
## Wiring Directions

Connect the aerial (a) to the beginning of the coil L1, L2, that is, that terminal fifteen turns removed from the tap. The tap is connected (a) to the ground end (b) to the A plus and (c) to the rotary plates of the variable condenser C1 post of the battery. The tap connection is made by scraping off the insulation at the

tap loop and soldering the lead to it. The remaining terminal of the coil is connected (a) to the stator plates of C1, (b) to one side of the grid condenser C3, and (c) to one side of the gridleak. The other side of the grid condenser connects (a) to the remaining free side of the leak and (b) to the grid post of the tube socket, marked G. If a Turnit variable gridleak is used it is advisable to get a separate leak mounting. If a variable grid condenser is used the Turnit leak can not handily be used without this mounting.

The A— is connected to one side of rheostat, the other side of the rheostat to the F— post on the socket. The plate or P on socket goes (a) to one side of the plate coil L3 and (b) to the stator plates of the variable condenser C2. The other terminal of L3 goes (a) to the rotor plates of C2 and (b) to one of the phone tips. The other phone tip connects to B+ 22½ volts. The phone connections may be made to phone tip jacks, easily mounted on the panel, and the tips inserted in these inexpensive jacks from the panel side. The phone tip jacks accommodate only the phone tips, hence require no plug. Do not confuse them with the regular run of jacks, which require plugs in which the phone cord tips are inserted. If two or more phones are to be used the phone tip jacks present no difficulty. Take two pairs of phones, for example. Connect one phone cord tip of one pair of phones to one of the jacks, and

# A Selective \$15 Crystal Set



A FAIRLY SELECTIVE crystal set (Fig. 1), constituting an improvement on most crystal hookups. A variocoupler L1 L2 and a variometer L3 are the only inductances used. The third tuning control is the variable condenser C1, .001 mfd., 43 plates. C2 and C3 are fixed condensers. This set may be made for \$15, including earphones.

By Brewster Lee

ANYONE who has used crystal circuits realizes how extremely difficult it is to get proper selectivity. Obviously the crystal circuit is of little steady value to the man living at a greater distance than twenty miles from a broadcasting station, and when he is within this radius if there are more than one broadcasting station the possibility is that more than one station will be heard at the same setting.

The crystal is by far the best detector for tone. Of

course its sensitivity cannot approach that of the tube, but for clarity the crystal is yet supreme.

The crystal circuit (Fig. 1) is an improvement along the lines of selectivity.

Referring to the circuit, L1 and L2 are two coils, L1 being variable. L1 is composed of 35 turns wound on a form 2" in diameter. L2, the stator, is 40 turns. L1 and L2 may be any standard variocoupler. Both coils are in inductive relationship. L3 is a standard variometer. See that the wavelengths range of the variometer is 200 to 600 meters otherwise this instrument will not cover the entire waveband effectively.

A fixed condenser (.0005 mfd.) is joined at the connection point of L1 and L2 and the other side of this condenser goes to the midpoint of the variometer. This condenser is very important for obtaining increased sensitivity and volume.

A .002 (43-plates) variable condenser is in series with the ground and a .001 fixed condenser is shunted across the phones.

In every receiver, the aerial ground system is very important, but especially so for crystal sets. As the efficiency of the detector is not high every bit of energy absorbed by the aerial and ground is required. The ideal aerial for this set would be 100 feet long, well insulated at the ends, the lead-in soldered or well taped. The lead-in should not be longer than 20 feet. The ground should be securely fastened on the cold water pipe. Scrape the pipe well so that the electrical connection will be good.

In wiring the set connect the aerial to the beginning of L1 and to one side of the crystal detector. The end of L1 connects to the beginning of L2 as well as to one side of the .0005 fixed condenser. The end of L2 goes to the stator of the 43-plate variable condenser and to one side of the .001 fixed condenser and one side of the phones. The other side or rotor of the variable condenser goes to the ground. The other side of the crystal detector connects with one side of the variometer, the other side of the variometer to the other side of the phones and to the open side of the .001 fixed condenser. The unconnected side of the .0005 fixed condenser goes to the joint connecting the rotor with the stator of the variometer.

## LIST OF PARTS

One Freshman crystal detector.	one .001 mfd.; one .0005 mfd.
One Amrad variometer.	One 7x14" radion panel.
One Shamrock variocoupler.	Two 4" dials.
One 43-plate Acme plain variable condenser.	One 6½x13" baseboard.
One pair Brandes 2,000-ohm phones.	100 feet of aerial wire.
Dubilier fixed condensers:	Two glass insulators.
	One lightning arrester.
	50 feet No. 14 insulated lead-in wire.
	Hardware.

## O'ROURKE'S DX SET

(Concluded from preceding page)

a cord tip of the other phone to the other jack. Then join the two remaining free cord tips to each other, using a clip. This is the best way to make multi-connection of phones and is known as series-connection.

Before attempting to listen in, turn on the rheostat. It should light the tube. If it does not, check back on your wiring, using both the wiring directions and the diagrams (Figs. 1 and 4) for this purpose. When the tube lights connect A+ and B—. Now tune in.

You will find that the set covers the entire band of broadcast wavelengths, present and contemplated, and works so satisfactorily that you will be glad to invite friends to your home so you can show them the kind

of set they'd like to have. Also, when you compare results with those obtained from some multi-tube sets you will find that this simple little 1-tuber not only holds its own but often exceeds in results what the other sets accomplish.

Another favorable comparison you will find true is that this set can be logged. The same stations will come in at the same dial settings. By removing turns to obtain higher readings on the plate dial or adding turns to obtain lower readings, the two dials may be synchronized so that not only may the set be logged but the tuning may be done in step. You will find 492 meters coming in, say, at 76, and by making the plate dial read 76 you will have to log only one number for the two dials all along the scale.

If regeneration is not sufficient, place a .001 mfd. fixed condenser across the phone tip jacks.

# Solving Mounting Problems

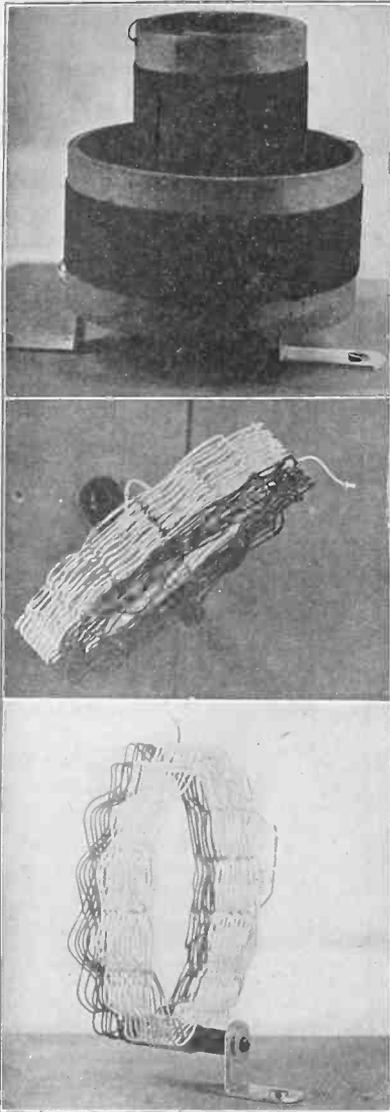


FIG. 1 (top) represents a manner of mounting two inductances that constitute a radio-frequency transformer, when the primary is on a separate form, inside the secondary. Two brass angles are used. One is fastened to the baseboard and its longer upright arm extends to the bottom of the primary form, hidden from view by the secondary form. The secondary is mounted in the same manner, only the two arms of the right angle used here are the same length, one fastened to the baseboard, the other to the bottom of the secondary form. The middle photo, Fig. 2, shows how a low-loss basketweave RF transformer may be mounted at an angle, as in the Neutrodyne, by being affixed to a bendable angle support. Fig. 3 represents the same low-loss RFT mounted, with a hard rubber shaft inserted where one of the dowel rods had been when the coil was wound. This shaft is secured to a brass angle, which is fastened to the baseboard. Whenever possible insulated material, such as radon, bakelite, Pyrex, etc., should be used, as the introduction of metal within the magnetic fields causes eddy current losses.

By Herbert E. Hayden  
Illustrations by the author.

**I**N constructing sets the coil problem is always a big one, in that its solution governs to a large extent the success of the set. Interwoven with the coil problem is that of mounting the coil. If a low-loss inductance is used and it is placed so near the condenser that their two fields interplay, losses are piled up. It is well to keep all coils at least 1½" away from the nearest

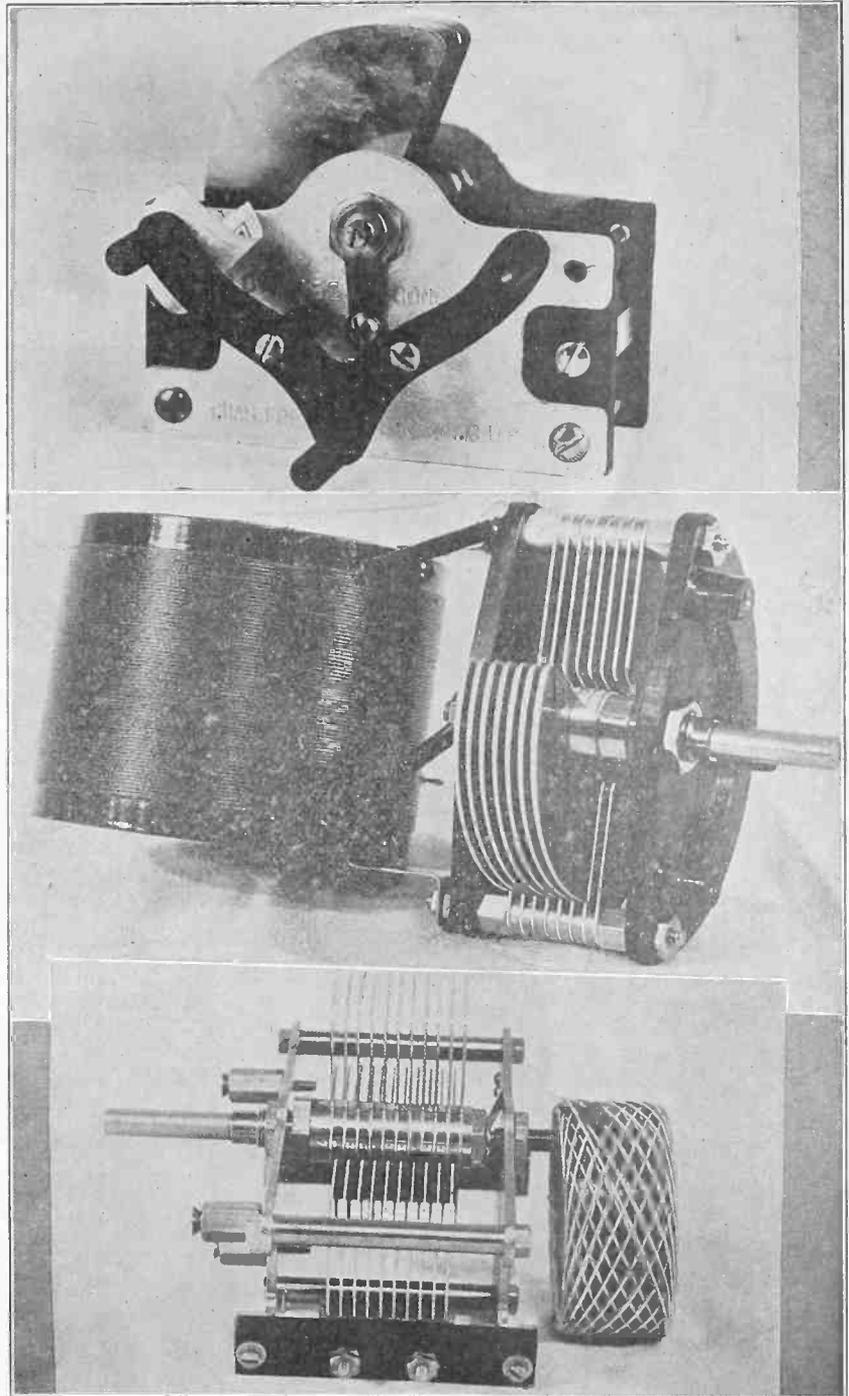


FIG. 4 (top) shows an insulation support secured to the back of the condenser, three short shafts extending from the triangular support so that they will fit into corresponding apertures in low-loss basketweave coils. This is the method of coil mounting used in the construction of the Freshman Masterpiece. The short shafts occupy spaces formerly filled by dowel rods when the coils were wound. Fig. 5, center photo, shows the method most popular in the regulation Neutrodyne, where Z-angle supports are used, one side of each being secured to the condenser endplate, the other side to the form on which the coil is wound. Fig. 6 is a photo containing advice to be cautious. In mounting any coil, honeycomb or otherwise, it should not be placed so close to the back of the condenser, whose electro-static field is thus introduced into the electro-magnetic field of the coil. A distance of 1½" should be maintained. The honeycomb is a low-loss coil.

point of the condenser. If possible, greater distance should be preserved. Coils mounted as shown in Figs. 1, 2 and 3 could easily be made to conform to this rule. In some instances the coil may be put purposely close to the condenser, to effect losses so that oscillation in multi-stage RF will be prevented. In somewhat the same way a poten-

tiometer stabilizes the tubes, at the price of high losses. Novices should not attempt the purposeful introduction of losses for stabilizing benefits except under expert guidance.

The market does not seem to be up to the demand for devices for mounting. Although they are manufactured, they seem hard to procure.

# The Completion of the Superdyne

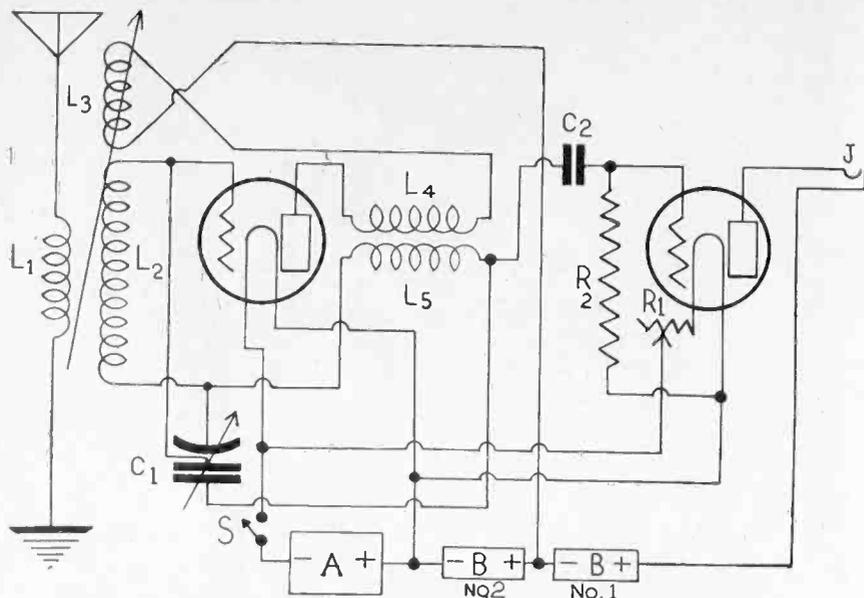


FIG. 14, the 1925 model Superdyne, without the audio stages. This affords only earphone service. To operate a loudspeaker, often on stations thousands of miles away, the two audio stages are vital. The tone quality of this circuit is unsurpassed by that of any other tube set.

[Part 1 of the article on constructing RADIO WORLD'S 1925 model 4-Tube DX Superdyne was published in the January 10 issue, Part III was published last week, in the January 17 issue, and the following installment completes the article. In the preceding issues 13 illustrations were printed, including the schematic wiring diagram, Fig. 1, January 10, and the same wiring shown in picture form, Fig. 13, issue of January 17].

## PART III.

By Herman Bernard

**B**EFORE the baseboard is fastened to the panel it is well to connect together the F+ posts of all four sockets. The F- posts of the three amplifier sockets also are connected together, but not to the F+ leads. In wiring, if you like bus bar, select the round kind, as it offers an easier path for the high-frequency currents, due to the larger surface. Radio currents travel virtually on the surface of the wire, not through the center. This phenomenon is known as the skin effect. Be sure in all your wiring to run the leads in as straight a line as possible. While angular wiring looks prettier and has an imposing effect on the uninitiated, it is not as efficient as the bee line method, for it simply compels the inclusion of unnecessary wire in the circuit, thus building up harmful resistance and causing condenser effects and eddy current losses.

The three amplifier sockets referred to above are Nos. 1, 3 and 4. See Fig. 9, p. 7, November 17 issue. They are the radio-frequency amplifier tube socket and the two audio tube sockets. As shown in the assembly plan, Fig. 3, p. 7, issue of January 10, the F post of the first audio socket, next to the P post of the second audio transformer, is in the rear, near the back of the baseboard. Thus it will appear on your assembly. As the other F+ posts are in front, slip a Morsing busbar union joint on the lead connecting the F+ posts of detector and last audio tube sockets, for this facilitates a right-angle soldered connection to the lead that parallels the panel. If busbar is used, it may be bent with round-nosed pliers, the end in the form of a loop for connection at the socket posts, or lugs may be soldered to the connecting ends

and the lugs fastened to the socket posts by screwing down the nuts. No. 18 double cotton covered wire may be used for this wiring all the way through. It doesn't look as well as busbar but it is equally efficient.

### Placing Coupler and Condenser

Now notice how the coupler is made. If the coupler terminals are at left, mount the coupler upside down, to bring them at right. Some couplers have left-handed leads because manufacturers had in view the placement of the coupler in another circuit to the right of the variable condenser, but the opposite method is used in the present case. With the coupler properly adjusted—if such adjustment is necessary—see to it that the variable condenser is mounted upside down. This precaution, as well as that concerning the coupler, while having nothing to do with the wiring being done on the baseboard parts, completes the correct preparation of the panel, so that difficulties will not be encountered later. The connecting leads are made shorter by the upside-down method of mounting the condenser, although the connections to the condenser stator posts are thus made a little difficult, because there isn't room between the lower part of the condenser and the baseboard to get your fingers through. If the condenser posts have not been connected as shown in Fig. 2, p. 6, issue of January 10, this work should be done now. Viewing the condenser with the shaft at right and the stator posts on top, you will see four such posts. Left to right these may be regarded as B, C, D and E. With a wired lead join B and C. Also join D and E, but not to B and C. As there are 44 stator plates (four sets of 11), two sets of 11 plates are thus joined, making two 22-plate condensers, each slightly in excess of .0005 mfd. maximum capacity. If a lead is wired to B, the left-hand post, and another to D, the post second from right, with 6" of slack, there will be no cramped efforts at making connections later from these stators, and the nuts will be securely fastened. If lugs are used and it is thus necessary to remove these binding post nuts, hand pressure will suffice to get them off. The screws are purposely slightly distended at top to keep the nuts on, but they may be forced off without injury and easily replaced. The post at extreme left,

### List of Parts for Superdyne

- One certified Superdyne coupler (L1L2L3).
- One certified matched radio-frequency transformer (L4L5).
- One Bruno Ultra Vario Condenser, No. 19 (C1).
- Two Federal (Nos. 65 and 65A) or two No. 3-A Stromberg-Carlson audio-frequency transformers.
- Three UV201A tubes.
- One UV200 tube.
- Four Federal sockets.
- One .00025 mfd. Dubilier grid condenser (C2).
- One variable Bradleyleak (R2).
- One Bradleystat (R1).
- One Bradley push-pull battery switch (S).
- One Tri-Jack or single-circuit jack (J).
- One 120-ampere-hour Exide storage battery.
- Two 45-volt Eveready B batteries (No. 1 and No. 2 in Fig. 1).
- One 4½-volt Eveready C battery.
- One 7x24" black Radion panel.
- One mahogany cabinet, size to match.
- Two silver Eureka dial pointers.
- Two ½" diameter hard rubber bushings.
- Ten feet of vari-colored Columbia battery cable.
- Two lengths of spaghetti.
- No. 20 double cotton covered wire or round bus bar for internal set wiring.
- One pair of Tower's earphones.
- One Western Electric loudspeaker.
- One Eby terminal block.
- 100 feet 7-strand aerial wire, 50 feet No. 14 insulated lead-in wire, ground clamp, one double Fahnestock clip, screws, U-angle, right angles, two dozen solderless lugs, half-dozen Morsing union joints, ground clamp, lightning arrestor, hardware.

on a line with the shaft, and regarded as A, is the connecting point to the common rotor, which goes to battery A—and thus enables the tuning of two coils—the secondaries of the coupler and of the RF transformer—with one motion.

### Which is Beginning and End

Now look at the RF transformer, the inductance mounted at right angles to the panel length, about in the middle of the baseboard. Look at the terminals. See which way they point. Draw the direction as an arrow on a piece of paper. Thus at top of the sheet will be an arrow pointing to the left, let us suppose, designating the terminal wire whose end-piece points in that direction. Of course the other and lower arrow you will draw will point in the opposite direction. Let there be a mistake, mark the word "top" at the top of the sheet. Now look at the coupler (not the RFT). See how the terminals point there. In all the couplers for this circuit all windings are in the same direction. Turn the tickler so that its winding is parallel with that of the stator windings of the coupler. Using the stator, either secondary of primary, as your guide, mark two more arrows on the same sheet of paper. Be sure to remember which arrow refers to which terminal. Pick out two terminals of the coupler and the RFT that point in the same direction. Tie a piece of thread around both terminals, temporarily, for these will be regarded each as the be-

# Why Condenser Is Upside-Down

ginning of the particular coil. It does not make any difference which are selected, so long as both terminals selected from the two coils point in the same direction. Now, inspect the tickler or rotary coil in the coupler. Find the terminal which is the beginning. This is the terminal which points in the same direction as does the beginning of the stator, either primary or secondary. Some care may be necessary here, for a few couplers have pigtail connections not easy to follow. However, if you will push the pigtail inside a fraction of an inch it will cause a movement inside that makes this pigtail or flexible wire lead readily discernible. Now follow the lead through, seeking the point where that pigtail is soldered to the winding. At this stage you will not find it difficult to determine the direction of the winding. Once it is found, pick out the beginning of the tickler, identify its external lead or binding post on the coil—depending on the type of coupler used—and then tie a piece of thread on the OTHER tickler terminal. In other words, the beginning of this the tickler is not to be identified, but the end of the tickler is. This is because the primary of the RFT is to be connected to the end of the tickler and the beginning of the tickler to the B+ high voltage (amplifier) post on the second terminal block.

### The Superdyne Principle

This method of reversing the connections, rather than reversing the windings and making connections in standard fashion, is an easier way of gaining the superdyne effect of reversely feedback current. If a coupler is being used that rotates completely around a circle, that is, has an actual 180-degree variation, no attention need be paid to these directions for determining the beginning and the end of the tickler, as the Superdyne effect is obtained then by rotating the coupler until the magnetic fields oppose, and the manner of connection is therefore immaterial.

The action of the magnetic fields when the Superdyne method is used is shown in Fig. 15. Take the stator coil, L2, secondary of the variocoupler. The field AB moves up the inside of the tubing and down the outside, then up the inside again, etc., round and round. But the tickler field CD moves up the outside and down the inside. Thus the two fields oppose each other. This is called counter-electromotive force (counter E. M. F.). The result of the reverse feedback is a suppression of oscillations within the set, although not a prevention of radiation. The lettered designations may also be regarded as showing the terminal connections of the windings, C and A being the beginnings, D and B the ends.

Now to resume the wiring. The P post of the detector tube socket, the one behind the rheostat, is joined to the P or P1 post of the audio transformer beside it. The G or S1 post of that audio transformer, which is for the first stage, by the way, goes to the G post of the first audio tube, the one right behind the transformer under discussion. The P post or plate of the first audio socket, the one second from the right, at rear, goes to the P or P1 post of the other audio transformer, whose G or S1 post is then connected to the G post on the last socket, extreme right.

Now, on the panel, one side of the battery switch may be wired at this point to one side of the rheostat, usually the right-hand side, looking from the panel front.

Before fastening the baseboard to the panel drill a 1/2" hole for the introduction of the battery cable and also a hole, somewhat smaller, if you prefer, for bringing in the aerial and ground leads.

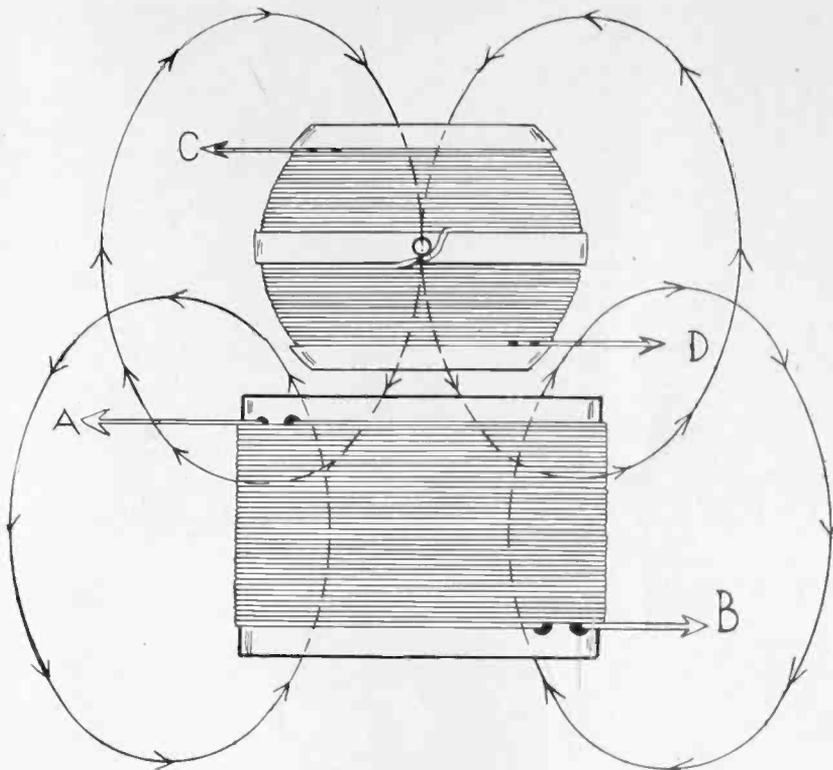


FIG. 15, the magnetic fields when the Superdyne method is used. The field of the tickler of the variocoupler is made to oppose those of the stator windings. The result is suppression of oscillations within the set itself. C shows the beginning of the rotor, D the end of the rotor, A the beginning of the stator and B the end of the stator. The tickler connection is reversed in the actual wiring, the lead from the end of the RFT primary going to the END of the tickler and the beginning of the tickler to the B+ amplifier. (No. 1.)

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FIG. 2, p. 6, photo of the variable condenser, with connections marked.

FIG. 3, p. 7, combined panel and assembly layout.

FIG. 4, p. 8, the set in a cabinet.

FIG. 5, p. 9, side view of the interior, looking from the audio end.

FIG. 6, p. 9, template for drilling panel holes to mount the condenser.

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FIG. 9A, p. 6, close-up of the mounted dials and dial pointers.

FIG. 9, p. 7, detail of the filament wiring.

FIG. 10, p. 8, how to connect the C battery.

FIG. 11, p. 8, three ways of connecting the grid leak.

FIG. 12, p. 7, graph of the condenser dial settings plotted against wavelength.

FIG. 13, p. 9, an asymmetrical or picture diagram for wiring the 4-tube set.

this can easily be determined by the "feel" of it when working. Then do the rest of the drilling from the back or outside toward the inside. In this way the wood will not be torn off in jagged fashion.

Stain may be applied to the holes to improve the appearance of the cabinet, otherwise the holes would show up in violent contrast with the mahogany or walnut finish. A better way, however, is to insert a 1/2" hard rubber bushing in each hole. This gives the added advantage of an insulated protection.

### Completing the Wiring

Now fasten the baseboard to the panel. The screwholes are 4" apart, 1/2" from bottom, thus providing four points for fastening, which are sufficient. Counter-sink the holes so that the screwheads do not protrude above the panel surface.

### Coupler Wiring

The rest of the wiring will be done from left to right. The aerial post on the first terminal block is connected to the beginning of the primary or small winding on the stator of the coupler (L1 in Fig. 1, p. 5, January 10). This terminal corresponds to the one on the stator that has a thread tied to it. The ground binding post on the block is connected to the other terminal of the primary. If previous advice was followed, wires already were affixed to the block and need only be connected to the corresponding leads on the coupler. In some cases these coil leads are so long that the slack wire previously connected to the block lugs will now be cut to a length of perhaps only 1". Anyway, the sole object is to join them without duplicated leads or including unnecessary wire lengths being in the circuit.

The beginning of the stator, secondary, (L2) with the thread on it, is connected to the lead already joined to the rearmost

These hole sare drilled in the back wall of the cabinet. The position of the holes is easily determined by placing the baseboard in the cabinet and marking the points nearest the two blocks, and right behind them, preferably equi-distant from top and bottom of the rear cabinet wall. In drilling, start from the inside, until the drillpoint just emerges through the back;

# Wiring Bernard's 2-Dial Set

post of the condenser stator, (BC) and is joined also to the grid or G post of the first tube, extreme left. The P post of this socket, representing the RF tube plate, goes to the beginning of the primary of the RFT. The end of the primary (small winding on the RFT) goes to the END of the tickler on the variocoupler, the lead previously identified with tie-string. If a 180-degree coupler is used, at either tickler terminal may be joined to the end of the RFT primary. The tie-strings are removed. The remaining free terminal of the tickler goes to B+ high voltage (amplifier). This is B+ No. 1 in Fig. 1. This post is on the still unmounted terminal block which later is to be fastened upright. But before fastening it finish the soldered connections to the lugs thereon. Therefore solder this lead from the beginning of the tickler to B+ amp. on the block and carry the lead right on, past the terminal block, joining it to the B or P2 post of the second audio transformer, second from right, and to the right-angle of the single-circuit jack. The battery side of the rheostat is now connected to the end of the coupler secondary (L2), still free, and to the rotor of the condenser, the accessible post at rear of the condenser, in line with the shaft, and to the end of the secondary or large coil of the RFT, (L5).

The remaining free terminal of the RFT secondary, L5, is connected to the other free stator binding post of the variable condenser C1 and to one side of the grid condenser (C2). The other side of the grid condenser connects to the G post of the detector tube socket. A variable grid-leak (R2) is mounted on a special leak clip mounting clip and the two ends of this mounting are connected respectively to the G post of this same detector tube and the F+ post of the socket. Do not connect one side of the leak to the coil side of the grid condenser. Be sure to connect it to the socket side. This has proven the best way of connecting the leak for this circuit, although the leak may also be mounted right across the grid condenser, especially if a grid condenser with mounting clips attached is the kind used. (See Fig. 11, p. 8, January 17).

This open side of the switch S is now joined to the A- post of the terminal block, the lead being soldered to the lug on this block. The other side of the rheostat, still unconnected, goes to the F- post of the detector tube socket right behind the rheostat. The A+ lead is now connected from the most convenient point to the lug on the A+ post of the terminal block. This completes the A battery wiring; in fact, nearly all the wiring.

The F or S2 posts of the two audio transformers are joined and this lead is

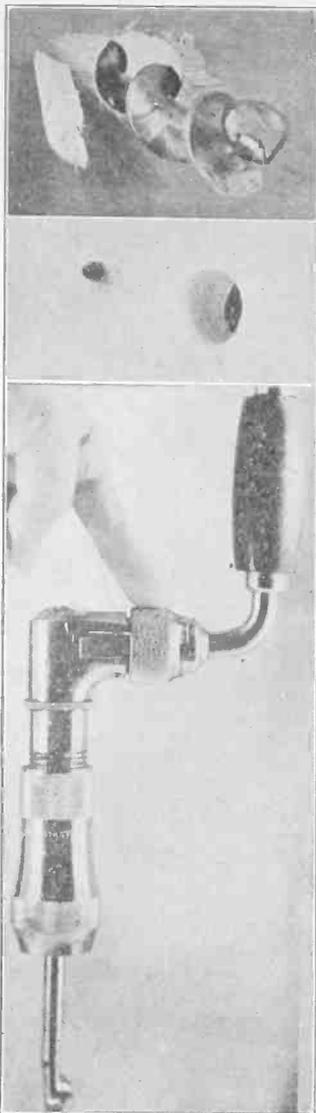


FIG. 16, showing what happens when the drill or bit is carried through the rear cabinet wall un-interrupted. A drill with a ratchet on (Fig. 17, lower photo) enables one to work with an up and down motion in close quarters inside the cabinet. When the tip of the drill emerges through the outside the drilling is finished in reverse fashion.

brought to the minus post of the 4½-volt C battery, the plus post of this C battery going to A- at the most convenient place. The B+ post of the first

AFT goes to the B+ low voltage (B+ det.) post of the terminal block (No. 2 in Fig. 1). Now join the P post of the last socket to the remaining unconnected side of the jack.

Connect the battery cable from batteries to binding posts on the terminal block. Connect aerial and ground to their posts.

## Ready to Tune In

Before attempting to tune in, however, turn up the rheostat, pull out or push in the filament switch, depending on how you wired it, and see if the tubes light. One of them may not. That will be the detector. Turn up the rheostat and that tube ought to light. If you find that the rheostat makes the tube burn brighter at first, and the more you keep turning the rheostat the dimmer the light becomes, reverse the leads at the rheostat terminals. Rheostats should be wired so that maximum resistance is in use when the first contact is made between the arm and the resistance and the resistance is lowered the more the rheostat is turned. If none of the tubes lights, check back for wiring errors. Consult the wiring diagrams, Figs. 1 and 13. The vital diagrams were published in previous installments so that reference might be made to them while the textual directions were being followed, thus minimizing the interruption of work.

After you have the satisfaction of seeing your tubes light, then connect aerial and ground to their respective posts and join the A+ and B-. Provision for this joining is made on the terminal block, and a lead may be soldered between the two, but it is perhaps preferable to make this connection from B- to A+ on the batteries themselves.

## Tubes to Use

The tubes to use are UV200 or C200 for the detector, and UV201A or C301A for the amplifiers. The UV and C tubes are the same. The detector plate voltage should be from 20 to 40. The amplifier voltage may be from 45 to 90 or even 110. Try the different voltages for best results, as the particular tubes you have may work remarkably better at certain plate voltages. These tubes require a storage A battery. The results, however, are better than if dry cell tubes are used, both as to volume and distance. The set will work well even if dry cell tubes are used throughout. These should be WD 12 or WD11. One slight handicap here is that the grid return of the detector tube must be to the minus A, since both RF and detector stages necessarily have the same grid return. The dry cell tubes do not work quite so well on a negative grid return, whereas a negative grid return is just the thing for the 200 and 300 type tubes. These soft detector tubes, however, draw 1 whole ampere per hour, a heavy drain indeed, while the amplifiers draw only a quarter of an ampere. Those desiring to cut the drain on the A battery may use the new storage battery Sodian tube, which is exclusively a detector and operates best on a negative grid return. Grid-brasing the detector tube doesn't seem to work very well in this circuit. In that case no gridleak or condenser is used. The voltage for 11 or 12 type tubes is about 12 to 14. For storage battery tubes it is 16 or more volts. In either case the amplifier plate voltage is used on the detector.

[This completes the article on the construction of RADIO WORLD'S 4-Tube Super-dyne, 1925 model. The issues in which it appeared are January 10, 17 and 24. Side-lights on the circuit will be published every week for several weeks. Trouble-shooting will be discussed next week, in conjunction with tuning.—EDITOR.]

## Foreign Stations a Problem

WASHINGTON.

ANOTHER problem which is beginning to take on importance with radio officials and which may some day be the basis of international complications, is the increase in interest in broadcasting in Canada, Mexico and Cuba.

The increased interest, it is believed, may result in an increase in the number of powerful broadcasting stations in these two countries. This would either result in a lot of interference or else cut down the number of wavelengths available to American stations.

A wavelength or frequency is the same all over the world. Take the 400 meter wavelength for instance. If a station powerful enough transmitted on that wavelength, it could be picked up all

over the world with the proper receiving apparatus. The intensity of the signals transmitted and the distance they would carry would depend upon the amount of power used.

Department of Commerce officials are not seriously worried at present over this problem but they see possibilities of a lot of future trouble in it.

"It is reasonable," they assert, "to expect that in the near future there will be powerful stations in Canada, Mexico and Cuba. To prevent interference it may be necessary for us to divide our wavelength band with these three countries. In such an event our number of channels would be cut down considerably and we would be faced with the problem of what to do with our own stations."

# A Variometer-Tuned Reflex

**Four-Tube Value Obtained by Reflexing the Radio-Frequency Stage—Volume Is Great and DX Is Obtainable.**

## VARIABLE LEAK VITAL

*By Abner J. Gelula*

USUALLY, in order to make a circuit more selective, volume is sacrificed to a certain extent. This is especially true of radio-frequency amplifiers. However, by employing radio-frequency combined with regeneration there is no need to lose the volume and selectivity is boosted to a very high degree.

Regeneration may be used in conjunction with radio-frequency only when the coupling unit is variable, otherwise the circuit will regenerate at but one point—the point when both the RF and detector circuits are in resonance.

The circuit shown in Fig. 1 is selective



ABNER J. GELULA

enough for most needs and is powerful. It is selective because of regeneration in the detector circuit. The impedance coupling is controlled by a variometer. The fixed condenser is of .00025 mfd. The gridleak must be variable. This is very important if the detector tube is to operate at the highest efficiency.

### 4-Tube Value Obtained

Although there are but three tubes, in effect there are four. The first tube is reflexed, handling both radio and audio-frequency currents.

It is of the utmost importance that the three variometers in the set cover a wavelength range of 180 to 550 meters. There are many variometers on the market that will cover 180 to 600 meters.

Do not use a soft tube as detector. It will be very unstable and exceedingly critical. The tubes best adapted to this circuit are, in the order of their value, UV201A, DV3, Meyers, UV199, WD11 and WD12.

Tuning is sharp but not critical. Regeneration is always under the most minute control. Always adjust the gridleak when receiving a distant station. It is only at this time that the most sensitive point may be found.

One rheostat controls all tubes. From 45 to 90 volts are applied to the plates of the amplifying tubes. Adjust the voltage of the detector. Although not critical, it obviously has a peak of its amplification constant. Vary it through a range of voltage from 18 to 45.

### Wiring Directions

Connect the aerial (a) to one side of the variable grid leak R3, (b) to one terminal of the variometer L1 and (c) to the grid of the first tube. Connect the ground (a) to the open end of the variable leak R3, (b) to the G or S1 post of the secondary of the first tube. Connect the ground (a) Fig. 1, and (c) to the open terminal of the variometer L1.

Connect the battery A minus (a) to the

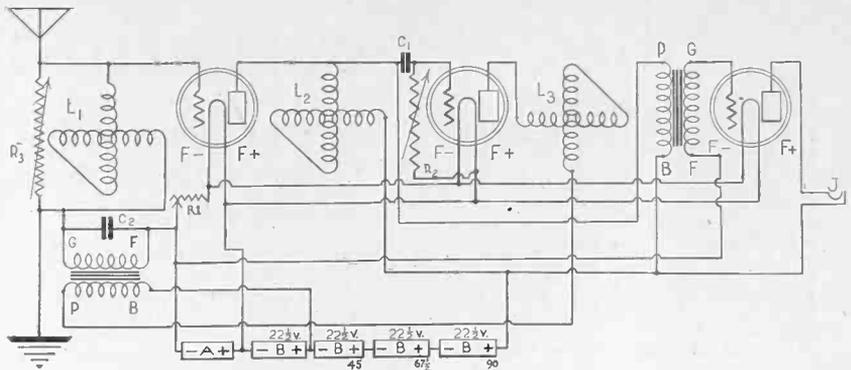


FIG. 1—The circuit of the 3-tube reflex. Three tubes operate as four, the RF being reflexed with the first AF. Distance comes in beautifully and tone is absolutely under the control of the operator.

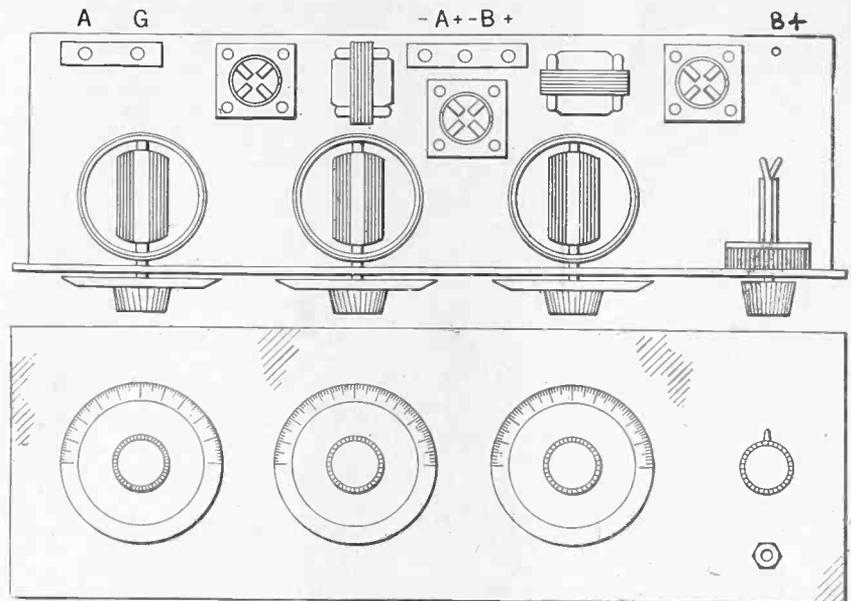


FIG. 2 (top)—The panel layout. Three variometers are mounted on the panel. These three instruments will take up approximately 15". The sockets and AF transformers are mounted in back of the variometers, the rheostat and jack to the right of the panel. Fig. 3 shows the baseboard layout. Three variometers, three sockets, two AF transformers, rheostat and jack are mounted on the 7 x 17" baseboard and 7 x 18" panel.

F or S2 post of the first audio transformer and (b) to one side of the rheostat R1. A .001 mfd. fixed condenser, C2, is connected, one side to the G post, the other side to the F post of the hitherto connected secondary of the first audio transformer. The open side of the rheostat is connected to the F— post of all three sockets. The A plus post on the battery is connected directly to the F+ posts of the three sockets.

The plate of the first tube is connected (a) to one side of the second variometer, L2, (b) to one side of the grid condenser and (c) to the P post of the SECOND AFT (at right). The other side of the grid condenser goes (a) to the grid of the detector tube and (b) to one side of the variable grid leak. The other sides of this leak goes to F+. The open terminal of the variometer L2 goes to the 90-volt +B battery.

The plate of the detector tube is connected to one side of the third variometer L3, the other side of that variometer going to the P or P1 post of the FIRST stage audio transformer (at left), the B or P2 post of that transformer going to the 22½-volt +post of the first of the B batteries. The P post of the second stage audio transformer, the one at right, Fig. 1, already is connected. The B post of that AFT goes to B+ 90 volts. The G or S1 post of the second AFT goes to the G or grid post of the last tube, the F or S2

post of this AFT being joined directly to the F—, battery side. The plate of the last tube goes to the one spring of the single-circuit jack J and the other spring to B+ 90 volts. Now turn on the rheostat. If the tubes light, then connect the A+ and B—. You are then ready to tune in.

### LIST OF PARTS

- Three variometers.
- Three sockets.
- Three 201A tubes.
- Two Federal AF transformers (No. 65 for first stage, No. 65A for second).
- One 7x18" radion panel.
- One 7x17" baseboard.
- One Campbell cabinet.
- Two Bradleyleaks (R2 and R3).
- Two Dubilier fixed condensers: .00025 mfd. (C1), .001 mfd. (C2).
- One rheostat, 6 ohms.
- One Federal single-circuit jack.
- Three dials.

## JOAK!

THE new broadcasting station in Tokio has been given the call letters JOAK by the Japanese Government, which gets as big a laugh as KOP in Detroit, WEAP in Mobile, WORD in Batavia, WHO in Des Moines and OXE in Denmark.

# How to Reform Loafing Tubes: Shock Them Into Working



WOUNDED tubes awaiting treatment.

HERE is a possible way of restoring the efficiency of a tube that lights but won't work:

Overheat the filament, then heat it normally.

Get a 22½-volt B battery. This gives the usually employed voltage variations, but also other variations not much used. You can connect to the 16½-post (for the minus lead) and to the 22½ volts (for the positive lead), getting 6 volts. Hence the possible voltages are 1½, 3, 4½, 6, 16½, 18, 19½, 21, 22½.

To restore a 199 or 299 tube, apply 6 volts for 38 seconds. Suddenly drop to 4½ volts, for 8 seconds.

For 201A or 301A tubes use 16½ volts for 30 seconds, then 8 volts for 10 seconds.

Do not have any plate current on.

These are thorium-coated tubes. With the other types the stunt won't work. Even the above tubes won't always respond to treatment. But if the trick isn't turned, there's not much lost—only a useless tube.

The tube originally suffered ignoble demotion due to overheating, having boiled the thorium from the filament surface. Hence no electronic emission, no plate current response, "No nothin'." The restoration may be accomplished by homeopathy. The excessive alternating voltage purposely applied to the filament boils the thorium from the inside of the filament wire and brings it to the surface. If this treatment were continued for any length of time it would soon boil all of the thorium from the surface, but you will notice that this excessive voltage is used only for a few seconds. We now apply the lower voltage which bakes the thorium on the surface, thus bringing the tube back to life again.

Tubes that would not draw the least amount of plate current and therefore would not operate were treated in the above manner and are now working efficiently.

Many times detector tubes can be made more sensitive by this treatment. Taking everything into consideration it is an inexpensive method of salvaging tubes.

## Don't Treat Cabinet Rough

NEVER strike the cabinet to test for poor connections. A sharp blow is liable to destroy the filament of one of the tubes in the set, or it may even knock a wire carrying high potential current loose and touch a filament lead, thereby burning out the tubes and running down the batteries.

## Dampness Hurts Set

NEVER let the radio set stand before an open window. It might rain and the set would be damaged if it were to get wet. Even if the set were not touched by the water itself, it might be damaged by the moisture carried in by the atmosphere.

## Storage Battery Best When Charged from 60 to 70%

MOST storage batteries may be gauged by the following hydrometer readings showing the percentage of fullness compared with the specific gravity:

%	%	%	%
1275—100	1245—76	1210—48	1175—20
1270—96	1240—72	1205—44	1170—16
1265—92	1235—68	1200—40	1165—12
1260—88	1230—64	1195—36	1160—8
1255—84	1225—60	1190—32	1155—4
1250—80	1220—56	1185—28	1150—0
	1212—25	1180—24	

This table does not hold for some batteries, where the 100% charge is represented by a lower reading, say, 1250.

Your A battery never should be permitted to show a reading below 1200 without an immediate recharge, as when a battery is discharged below about 1200 lead sulphate begins to form on the battery plate, greatly impairing the action of the battery and shortening its serviceable life. A storage A battery gives its best service, particularly on multitube sets, at a point above from 60% to 70% charged.

## Scientist Denies Each Electron Has Field

PARIS.

M. F. GUERY, a French scientist, read a note before the French Academy of sciences in which he attempted to refute the theory that each electron possesses a magnetic field, and that the total value of the magnetic field of a current is made up of the geometrical sum of the magnetic fields of the electrons composing it. This conventional reasoning, M. Guery held, is merely a mathematical expression and has no basis in fact.

## How to Handle Radiating Set

DESPITE educational efforts many fail to recognize that they themselves often are the means of ruining their neighbors' enjoyment—and their own.

A set that is radiating never can be delivering anything approaching sweet musical notes or clear speech. At best there is a mushiness which thickens speech and garbles tones. If in no other way a receiver owner can tell when his tube is in oscillation he surely can by turning down the filament and adjusting the plate circuit control. The point where it is clearest is the proper operating point.

Bringing in outside stations will be a bit more difficult, perhaps, but there will be greater satisfaction all around. Where signals must be found by a beat note the tube filament should be lowered to the proper operating point the moment the stations' carrier has been located and tuned in without the beat note.

If the beat note can be picked up, then the program can be also without radiation.

## Citizens Ask Law Against Sets that Radiate

THE Citizens' Radio Committee, New York City, backed by some manufacturers of radio equipment, started a campaign to obtain legislation prohibiting the use of receivers which radiate interfering noises.

## McCormack-Bori Debut Brings Good Results

FOLLOWING the debut of John McCormack and Lucrezia Bori before the microphone, McCormack "packed 'em in" at a concert at Carnegie Hall, New York City. The police reserves had to be called out to quiet some insistent ticket seekers.

The publishers of the song "Marcheta," which he sang that memorable radio night, reported selling 12,500 copies during the two days following the broadcasting; a record.

The phonograph industry reported increased sales of McCormack and Bori records, as well as other records.

## New Storage Battery Affords 2 Voltages

THE National Carbon Co. is marketing a new eveready storage battery, 6 volts, with a tap at 2 volts for operating the 11 and 12 type tubes. The hydrometer readings for this battery are: 1250, full; 1175, one-half; 1125, time to recharge.

## Heaviest B Batteries Last Longest

DRY cell "B" batteries are rated according to ampere-hour capacity and also by weight. The same voltage may be delivered by one, three or five pound batteries, but the heaviest one will deliver the voltage over the longest period of time.

## Put the Skids Under RF by Having Parts Bright

THE parts of a radio set work best when they are bright. A dull surface usually means that corrosion has taken place, which offers resistance to high-frequency radio currents. As radio currents travel on the surface it may pay to brighten the parts of the set sometimes.

## Another Station for N. Y.

NEW YORK CITY soon will have another station. It has been heard during the past fortnight under the experimental call letters of 2-XH. The station is located in the Hotel McAlpin.

# An \$18 1-Tube DX Circuit for the Beginner

By Feodor Rofpatkin

WITH two stages of audio-frequency amplification added to a sensitive detector circuit the results are sometimes as satisfactory as those from multi-tube sets.

As to construction it is simplicity itself. The addition of two stages of AF would add to practical distance reception. The three coils may be wound at home. The set utilizes only one variable condenser and one split-variometer. Selectivity was satisfactory, as was DX and volume.

If the primary coil is wound at home, the variometer and condenser purchased, the entire set may be built for \$18, phones and batteries included.

It is well to get a pigtailed variometer as it is easier to split. In splitting a variometer the connection must be broken between the rotor and stator so that the coils are operating inductively, not conductively. Break the pigtail that connects the rotor with the stator. Be careful that it isn't the opposite terminal that is clipped, or you will begin wondering why the set doesn't work.

Now that we have the variometer split, let us consider the other tuning instrument, the variable condenser. It always pays to invest in a good condenser. A vernier is valuable but not absolutely necessary in this circuit.

Tune slowly. The split variometer is turned until a quiet rushing sound is heard which indicates that the set is in oscillation. Now turn the variable condenser until the desired station is heard, after which cut down on the variometer slightly until the proper tone and volume are attained.

The coil which is in series with the aerial and ground is composed of 45 turns of No. 22 double cotton covered wire. It must be placed out of the inductive field of the variometer, i.e., at right angles and at as far away as possible.

In wiring the set connect the aerial to the beginning of the 45-turn coil, the ground to the other end. From the aerial end of this coil a wire connects to the stator plates of the variable condenser and to the rotor of the variometer. The other side of the rotor goes to the grid condenser, the other side of this condenser to the grid of the tube. From the ground side of the 45-turn coil connect to the rotor plates of the variable condenser and to one side of the stator coil. The other side of the stator coil goes to the plate of the vacuum tube. One side of the phones connects to the plate of the vacuum tube, the other terminal of the phones to the positive B battery. The negative B goes to the positive A, the negative A to one side of the filament of the vacuum tube. The other filament goes to one side of the rheostat, the other side of the rheostat to the positive A battery. The grid leak goes across the grid condenser.

## LIST OF PARTS

- One spider-web form.
- One-half pound No. 22 DCC wire.
- One .0005 mfd. variable condenser (normally 23 plates).
- One variometer.
- One type 11 or 12 vacuum tube.
- One rheostat.
- One pair phones.
- One gridleak, one grid condenser.
- One 22½-volt B battery.
- One 1½-volt dry cell.
- One .001 fixed condenser.
- One socket.
- Aerial wire, connecting wire, hardware.

## "The More Listeners, the Merrier," Says the A. T. & T., Denying Private Program Move

THE American Telephone and Telegraph Company denied reports that it had perfected and would use a device that would make it possible for it to control the reception of its broadcast programs.

"As far as this report relates to the American Telephone and Telegraph Company," said W. E. Harkness, Assistant Vice President in charge of broadcasting, "there is nothing to it. We are not working on any such project. When the report was first brought to our attention we searched our souls as to what it could all be about and we came to the conclusion that somebody had seen in our studio the loud-speaker device which we have been using for a long time to give visitors a sample of how any given program will sound over radio.

"There is no technical obstacle at all to transmitting programs to any given point by wire, which is what this report seems to have in mind. We do it every time we send a radio program over land wires to be broadcast from a distant city. Neither is there any technical obstacle to broadcasting by radio matter which can only be picked up by receiving instruments possessing the key. As a matter of fact that has actually been done for commercial work by the process known as 'scrambled radio.'

### Calls Popular Belief Wrong

"The American Telephone and Telegraph Company could, of course, use either of these processes in its work, but is not working on them or interested in them. As a matter of fact the popular opinion that the 'big companies' are trying to discover some way by which they can limit the reception of their broadcasting to those who will pay them for it is all wrong. The big broadcasters are of two classes, those who use radio to advertise and those who broadcast to promote the sale of receiving sets and supplies.

"It is evident, therefore, that no broadcaster's interest leads to doing anything that will limit the reception of broadcasting, but leads instead to extending it in every possible way. It is said that if a manufacturer made an exclusive set

and then got up unusually good programs that it would constitute a selling argument. I think that argument totally disappears when you ask the question: What radio enthusiast would want to confine himself to any one station, no matter how good?

"To dream of selected broadcasting is to run counter to the whole philosophy of the radio industry. There is nothing in it as conditions stand today and there is every reason to believe they will continue to exist for some time to come. Certainly our company has no intention of trying anything of the sort."

### His Views Are Confirmed

The attitude expressed by Mr. Harkness was confirmed in other directions. In fact, some pointed out that the American Telephone and Telegraph Company was in a position to control down to the last degree the reception of programs such as it sends from Station WEAJ. This could be done by the use of the telephone service, which would come within the patent and charter rights of the company, and could be started tomorrow, these persons say.

Regarding this, an official of the telephone company said that as far as he could see no technical or other objection stood in the way, except as Mr. Harkness had said.

"If this scheme were put into effect," said this official, "it would require that an extra set of wires be used for the purpose to obviate the danger to the efficiency of the telephone service. This would mean considerable expense and if that were apportioned at the rate, for instance, of \$10 a month, let us say, how many people would be willing to sign a yearly contract for it? The telephone company could easily spend \$5,000,000 or \$10,000,000 in New York finding out whether there was any public demand for such a service, and if it found there was not, it would be a pretty expensive experiment."

Experiments in the direction of "controlled" radio broadcasting are being made by companies interested in the so-called "wired radio" process. On Staten Island these experimentors have used the wires of public utilities companies supplying electric light and power. Their problem is considered harder than that of the telephone company, for there are more engineering difficulties in transmitting programs over power lines than over telephone lines. No "wired radio" service has yet been offered to the public.

## How to Get Higher Waves

IF a receiver fails to reach the higher wavelengths in the broadcast band it indicates a lack of capacity in the tuning condensers. Sometimes the trouble can be eliminated by adding a coil of twenty turns of number twenty-two gage double cotton covered wire in series with the aerial. Another way is to connect a fixed condenser of .0001 microfarads capacity across the terminals of the variable condensers and across the aerial and ground binding posts.

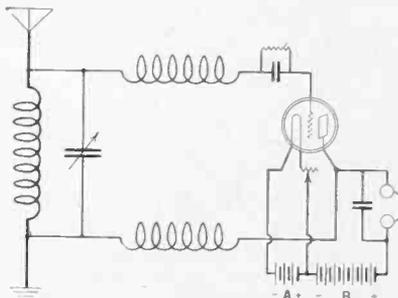


FIG. 1—The circuit for a 1-tube DX receiver. It is a good circuit for the beginner. The variometer is a split. If you are afraid to attempt splitting the instrument yourself, have your dealer split it for you. It takes only a few minutes

# How to Mount Neutroformers at the Correct Angle

## The Radio University



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

I BUILT the 3-circuit tuner you can log but have trouble in getting up to the point of oscillation without its "spilling over." Can you tell me any remedy for this?—H. B. Wait, 139 W. 8th St., Bayonne, N. J.

Take off about 3 turns from the plate coil.

DO YOU know of a better combination of tubes for the low-loss Superdyne than Meyers tubes for RF and AF, and a DV2 for detection; would you advise installing a voltmeter in the set?—Lawrence A. Brown, 14 West St., Newport, N. H.

Our choice would be: Meyers for RF, 201A for detection and audio, or DV2 for detection with 201A for audio. A voltmeter only complicates the set and it is preferable to have it as a separate instrument.

IS a transmitting license required for transmitting with only a Ford spark coil?—John Pompeo, 73 Bames St., Bristol, Conn.

Yes. An operator's license and a station license are required for the operation of any type of transmitter. At any rate do not attempt to use a spark coil for transmission. It creates a great amount of interference and is extremely difficult for others to tune out. If you desire to transmit learn the code so that you can receive at the rate of 12 words per minute, write to the Radio Inspector, Bureau of Navigation, Customs House, New York City, for a license, 2nd grade amateur, if you are unable to get to New York personally to take the test for first grade. Do not transmit without a license.

CAN YOU tell me what changes I need to make to use the Sodian tube in the Anderson Superdyne?—Wm. H. McGann, 53 Westminster St., Pittsfield, Mass.

No changes are necessary for the new Sodian tube.

WHERE can I get a Superdyne coupler and coil?—J. L. Bingham, 2409 1st Ave., S. Minneapolis, Minn.

See our advertising columns.

CAN I get a blueprint of the Bernard's 3-tube Superdyne?—H. G. Raveling, Warren, Minn.

We have no blueprint of this circuit. The wiring directions published in the article were very explicit. Anything you don't understand please feel at liberty to inquire about.

IN REFERENCE to Caldwell's Favorite Receiver in the issue of Dec. 6, what make RF transformer is used? (2) What wavelength will the receiver cover?—A. W. Tribbey, Maud, Okla.

Any reliable make RF transformer will do. (2) Approximately 200 to 550 meters.

I HAVE a 2-tube regenerative receiver with which I am getting good results, except that at times the stations fade in and out. Can you tell me a remedy for this?—Harold Patterson, Buffalo, Minn.

Fading is a phenomenon that still baffles scientists.

I HAVE constructed a 3-circuit regenerative set, but the usual regenerative whistle is not present. Can you tell me why?—Herbert Chrysler, Homer, N. Y.

You haven't enough turns on the tickler, or your tube doesn't oscillate or you haven't the correct B battery voltage or your A battery is low. Test all of the above mentioned. Try a .001 mfd., fixed condenser across the phones.

IN O'ROURKE'S 1-dial DX circuit in the issue of Dec. 6, is the tubing 3 or 3 1/2" in diameter? (2) What is the capacity of the fixed condenser C3? (3) Where does the other side of the rheostat go?—B. Manthey, 129 Hart Ave., Winnipeg, Can.

(1) 3 1/2". (2) .0005 or .001 mfd. (3) To the A plus.

CAN you tell me what circuit the Thermodyne

uses?—R. E. Lee, 3002 McGee Traffic Way, Kansas City, Kan.

The Thermodyne has three stages of tuned RF, detector and 2 AF. All condensers are controlled with one dial by a gearing system. Each condenser has a vernier which is brought out on the panel.

HOW can I wind the Neutroformers for the Neutrodyne? (2) Where does the tap go? (3) How do you get the correct angle?—E. A. Williams, Rocky Mt., N. C.

On a 3" form wind 60 turns of No. 22 DCC wire. Over this wind 6 turns for the primary.

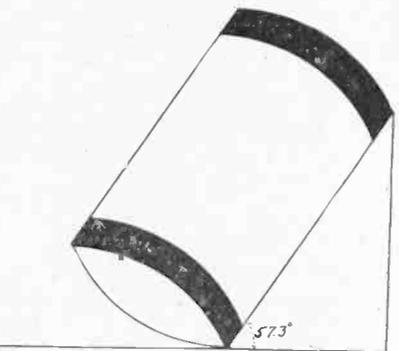


FIG. 79—Getting the correct angle for the Neutroformers in the Neutrodyne. The angle is 57.3 degrees, and to get the proper neutralization of the RF circuit the coil must be mounted at this angle. Place the coil against the angle as shown, after cutting the angle out of the sheet. The side of the angle must be parallel to the edge of the panel, assuming the panel corners are exactly 90 degrees.

(2) Tap the secondary at the 15th turn from the grid end. (3) Coils are mounted at an angle of 57.3 degrees. Without the aid of geometrical instruments it would be difficult to ascertain the exact angle. Therefore the angle is given in Fig. 79.

MUST the variable condenser necessarily be placed with a comparatively wide spacing between them in the Superdyne circuit?—A. H. Barrett, 5 Watson St., Boston, 18, Mass.

No; 1 1/2 to 2" between condensers is sufficient.

HOW long should my aerial be?—Hazel Levine, Iron City, Mich.

That depends upon the type of set used. If one or two stages of radio-frequency amplification are used your antenna should not be longer than 50 or 60 feet to eliminate interference. If the set is of the straight regenerative type, using an untuned primary, the antenna length is not so

## 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

important and can be anything from 60 to 120 feet long. On the other hand, if you have a crystal set it is necessary that you use at least 100 feet. If you have a Super-Heterodyne you should operate from a small loop, due to the great sensitiveness of the set, but as many people like to experiment with Super-Heterodynes and outdoor antenna it should in no case be longer than 25 to 30 feet, or trouble is sure to be experienced from interference and picking up a considerable amount of man-made and natural static.

WHICH is better, Bernard's or Anderson's 4-tube Superdyne? (2) Can the Superdyne be built with type 11 tubes? (3) What is the difference between the type 11 and 12 tubes? (4) Can dual-terials be used instead of the basket-weave?—Orlin Folwick, Robbinsdale, Minn.

Both are approximately the same in results, but Bernard's has only two controls against Anderson's three. (2) Yes. (3) Both are the same as far as the internal characteristics are concerned. The type 12 has a standard 4-prong base. (4) Yes.

IN REFERENCE to the DX crystal circuit in the issue of Dec. 6, will a good low-loss tuner do in place of coils L1, L2, L3? (2) If this would be O. K. where should coil L4 be placed? (3) I have a 23-plate variable condenser with the plates separated by washers and would like to know if the capacity can be changed by removing some plates and how many plates to remove?—John A. Sousa, 11th C. A. Band, Ft. H. G. Wright, New York.

(1) Yes. (2) Coil L4 may be put any place convenient. (3) Remove 10 plates. The condenser should then have 6 variable and 7 stationary plates, or vice versa. It would be easier to remove turns from a coil than plates from a condenser.

IN reference to Gelula's Superflex in the issue of Dec. 27, are the center cores 1 and 1 1/2" respectively, or 2 4"?—E. W. Bowers, 814 Prince St., Grand Rapids, Mich.

The center cores are 1 and 1 1/2" respectively.

WILL the 1-tube set and crystal detector in the issue of Dec. 27 operate a loud speaker on 500-watt stations 15 miles away? Is it selective enough to tune through the locals?—Henry E. Greer, Marin, Cal.

No. Selectivity is fairly good and you should not be troubled with interference.

I BUILT a Superdyne and should like to add three stages of audio-frequency amplification. Is it advisable? (2) Would you advise filament control jacks? (3) Should this set be selective enough to tune in stations 7-kilocycles apart?—Ork. Graef, Niagara, Wis.

You may be able to use 3 stages of AF if you are very careful about proper shielding, correct placing of transformers, and wiring. Use low-ratios throughout, 2 1/2 or 3 to 1. However, 2 stages of AF should prove ample. (2) No. (3) Yes, if you are located not nearer than 40 miles from two such stations.

I LIVE one mile from a 1,000-watt station. How close to the wavelength will the Anderson 4-tube DX Superdyne allow me to come? (2) What are the relative advantages of the various superdynes? (3) What more will the 4-tube Superdyne do over the 3-tube?—Elmer F. Backer, 2536 Fulton Ave., Davenport, Ia.

(1) With an aerial of approximately 65 feet, you should be able to get within 20-meters. (2) A difference in sensitivity and selectivity. (3) Increase distance, more volume.

WHERE can the Superdyne coils be obtained? what type of tubes did Bernard use when he received the European broadcasts?—Lloyd Updyke, Bedford, Va.

See our advertising columns. (2) RF and AF, 201A; detector, 200.

I CAN get all local stations in New York except WEAF. All locals come in with very good volume. I have a filter set. (2) Can you tell me if it is possible to get distance?—Ralph Rowland, 56 E. 93rd St., New York City.

The set does not go up high enough in the wavelength band. Add turns. (2) Yes, with a good aerial and ground system.

I HAVE built the Masterpiece but get a regenerative whistle which I can't eliminate. Can you help me?—Dr. C. H. Gardner, U. S. Marine Hospital No. 15, 40th St. and Penn. Ave., Pittsburgh, Pa.

To get the Masterpiece neutralized correctly regulate carefully the distance between the coil and the variable condenser.

I BUILT the split-variometer set described by Neal Fitzalan in the issue of Nov. 1 but cannot receive anything more than a hum. Can you tell me of anything that will help clear this up?—Paul Scharf, RED 3, Princeton, N. J.

If you haven't a grid-leak condenser in the

# A Super-Heterodyne That Uses Six Tubes

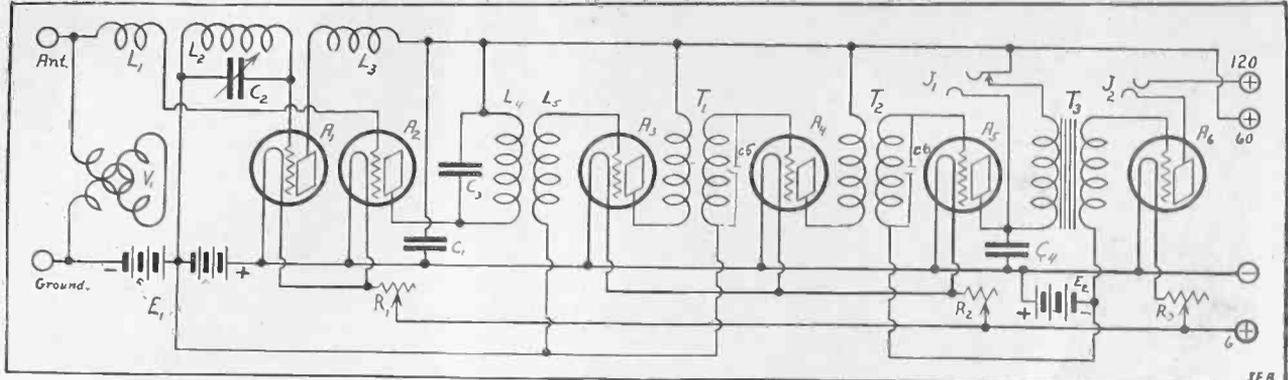


FIG. 89.—The 6-tube Super-Heterodyne. This set will operate very efficiently on a loop, DX results are good, tone good and selectivity excellent. Coils L1, L2 and L3 are in inductive relationship, and may be a good 3-circuit varlocooper. L4 and L5 are the filter coils, T1 and T2 the interfrequency transformers. The filter coils and the interfrequency transformers may be bought. Making them is a rather difficult home task.

grid lead, insert one. This circuit was designed to operate best without the condenser, but it would be well to try it.

THERE are two jacks used in the Superdyne. Where is each placed?—E. G. Tacy, Madison, Wis. The double circuit jack is placed at the output of the detector. The single-circuit is used at the output of the last stage.

I AM experiencing some trouble with my 3-tube Ambassador. It was designed for 201A tubes, but I am using 199s. Would that cause trouble? Is there any way to fix the tickler so that the adjustment will not be so critical?—Russell Schmid, Lambertson, Minn.

The 199s are usually a bit reluctant to oscillate. However, if the tubes will oscillate remove 4 turns from the tickler.

WILL you kindly print a circuit using six tubes, a set upon which I could depend for long distance reception?—James Danvers, 1132 Braddock Ave., Braddock, Pa.

Fig. 80, the 6-tube Super-Heterodyne, will meet these requirements. The construction was fully described in the December 6 issue.

## RADIO WORLD'S

### Broadcast University

Questions and Answers on the Air Every Friday at 6.30 P. M. at WGBS, the Gimbel Bros. Station, New York City.—Department Conducted by Abner J. Gelula, RADIO WORLD'S Technical Editor.

I WAS listening to Herman Bernard the other evening through WGBS and heard him say that he would answer all questions. Will you kindly tell me the respective features of the Neurodyne, Superdyne and Superflex?—Emil Krulish, Ellis Island, N. Y.

The Neurodyne contains 5 tubes, Superdyne 4,

Superflex 3. The Neurodyne utilizes two tuned, neutralized stages of RF, detector and two AF. The Superdyne is one stage of RF with regeneration detector and two AF. The Superflex utilizes 3 tubes, one reflexed; one stage of RF, detector and two AF, all in three tubes. The Neurodyne is very quiet in operation, gives good distance, selectivity fair, volume good; Superdyne not so quiet in operation, good distance, selectivity and sensitivity good. The Superflex is a typical regenerative set in operation, good distance, excellent selectivity, good sensitivity. The tone quality of the Superdyne is superb.

INSTEAD of using No. 20 DCC wire, can I use No. 24 enamelled for winding the Superdyne coils?—Wm. A. Pahl, 1916 E. 7th St., Parkersburg, W. Va.

Yes, but double cotton-covered is preferable.

The following are some others whose questions were answered, either over the air from WGBS, or by mail. All questions sent in are answered either in print, over the air or by mail.

- Wm. Bossong, 370 W. 127 St., New York City.
- J. K. Durcoll, 219 138th Rd., Springfield Gardens, L. I. N. Y.
- A. Everhard, 116 E. 66th St., New York City.
- J. Soderstrom, 15 Willow Terrace, Hoboken, N. J.
- Emil Grauerboz, 319 Epsilon Pl., Glendale, L. I. N. Y.
- James Hart, 235 W. 119th St., New York City.
- Wm. W. Adams, Shamokin Dam, Pa.
- Jos. A. Ward, 104 Burgess Pl., Passaic, N. J.
- C. E. Hine, 386 2nd St., Brooklyn, N. Y.
- H. B. Matthews, 165 Main St., Groton, N. Y.

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.

RADIO WORLD'S CLASSIFIED DEPARTMENT. If you want to buy, sell or exchange anything, use RADIO WORLD'S Quick-Action Classified Department, 10 cents per word, 10 words minimum. RADIO WORLD, 1493 Broadway, N. Y.

## LATEST PATENTS

Radio Cabinet (No. 1,519,260), invented by Edwin Jay Quinby, and assigned to the Quinby Radio Frame Corporation. Makes the frame of radio cabinets adjustable, to render the operating parts of the cabinet accessible to the operator.

Rheostat (No. 1,519,591), invented by Harold De Veau Perry, of Cincinnati, O., and assigned to Skylark Radio Corporation. Permits the complete length of the resistance unit to be covered in one motion.

Signaling System (No. 1,519,615), invented by Raymond A. Heising, of East Orange, N. J., and assigned to Western Elec. Co. Provides a generator of modulated oscillations wherein the slide frequencies, which for some purposes constitute the useful components of a modulated carrier current, may be conveniently separated and utilized and wherein the unmodulated component of carrier frequency may be wholly or partly suppressed.

Harmonic Generator System (No. 1,519,619), invented by Joseph W. Horton, of East Orange, N. J., and assigned to Western Electric Company. Produces a series of waves having different frequencies separated by an accurate and constant frequency interval, a condition very essential in multiplex carrier wave systems.

Apparatus for Radio Communication (No. 1,519,899), invented by Raymond C. Benner, of Bayside, N. Y., and assigned to National Carbon Co., Inc. Eliminates undesired oscillations by the arrangements of the units of dry cells in a single line.

Rheostat (No. 1,519,621), invented by Arthur Atwater Kent, of the Atwater Kent Mfg. Co., of Philadelphia, Pa. Provides a rheostat structure comprising relatively rotatable base and cap, means on one of them bearing upon the other and having within it a recess, whereby there is formed between the base and cap a substantially closed chamber, a resistance member and a coating relatively movable contact member disposed within said chamber, said contact member movable along said resistance member in direct contact therewith, one of said members being fixed with respect to said base and the other of said members being fixed with respect to said cap.

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and Get your own number. Put the number on your queries and they will be answered personally the same day as received.

And Get Full Question and Answer Service for the Coming 52 Weeks.

RADIO WORLD, 1493 Broadway, New York City:

Enclosed find \$6.00 for RADIO WORLD for one year (52 Nos.) and also consider this as an application to join RADIO WORLD'S University Club, which gives me free information in your Radio University Department for the coming year, and a number indicating my membership.

Name .....

Street .....

City and State .....

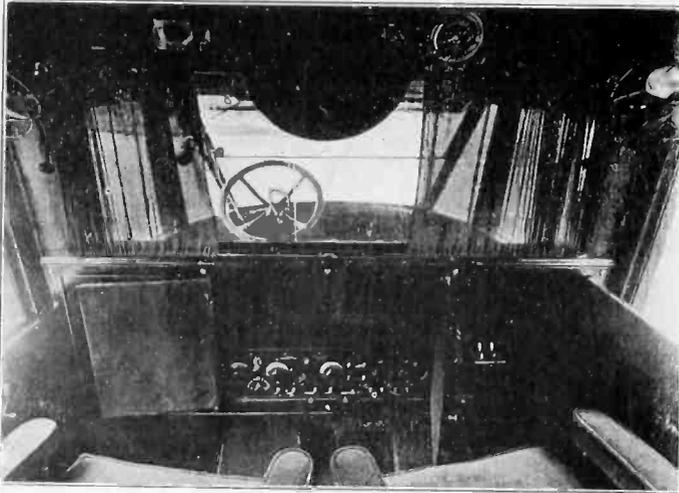
Telegraph queries will be answered collect the same day as received. Be sure to direct in your query that the answer be sent collect.

## RADIO WORLD'S 4 TUBE: DX SUPERDYNE: 1925 MODEL

### THIS NAMEPLATE FREE!

Put it on the panel when you build the 1925 model. Send in your order now. As these nameplates are now being manufactured it will take a little time before we can deliver them. They are of the transfer type (decalcomania) and may be put on just as easily after the set is built. Address Superdyne Editor, RADIO WORLD, 1493 Broadway, New York City.

# A Radio Auto



**AUTO JUST LIKE HOME**—As long as the radio is present, home is there, says W. K. Kellogg, of Battle Creek, Mich., who likes motoring. He couldn't bear to leave the home-like radio behind. Therefore, he combines travel, motoring and radio in this 27-foot automobile de luxe. His party can travel at 30 to 35 miles an hour without any discomfort or interruption of the program. The loud-speaker may be seen over the chauffeur's seat. (Kadel & Herbert)



**WHAT COULD BE SWEETER?**—A good crowd, a dog-sled and a radio! Jacques Suzzanne, famous dog-musher of the Adirondacks, gives his huskies a treat with the radio outfit. Miss Caren Crouse and M. Peter Escher will back the statement that radio gives that rounded edge to all sports. (Underwood & Underwood)



**THE CHAUFFEURS' PARADISE**—Franklin Simon & Co., Fifth Avenue department store, New York City, has established a rest-room for chauffeurs. While Madame does her shopping a modern radio outfit entertains the drivers. The photograph shows a \$10,000-a-year store official tuning in for the sake of three \$45-a-week chauffeurs. (Underwood & Underwood)

# Playing "Broadco



**THE MICROPHONE** now enters Toyland. Thus may children have an art of talking to the world at large when they are severely alone. In grown-up regarded as denoting "money in the bank." Violet O. Sileo, Woodhaver distinguished though small audience of Toyland celebrities while speaking a maybe as practice for later years. There's no aerial, no control room, non adjuncts of a broadcasting station. But remember this is the Land of imagination makes up for all things. (International Ne

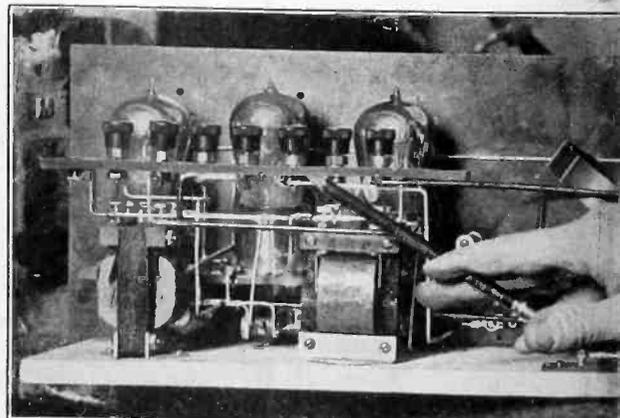


### A PROGRESSIVE BISHOP

**IF** a Bishop may be pardoned for momentary relaxation from the problems of the world spiritual, an unconditional pardon should be granted to Bishop James E. Freeman, Washington, D. C., for radio better equips him for the large tasks of his office. At his Federal set he tunes in and appeases his DX appetite, for which even a Bishop may be excused. Say not 'tis jazz that tingles in his ears; rather some solemn lecture on the ascendancy of the spiritual over the mundane. Ayrhow, the Bishop is a real radio fan. (Henry Miller.)



**AN ADDITION** to the night broadcasters from Although still in her '20s of the most talented comedians made her first appearance with the Symphony Orchestra



**YOU** may test the undistorted frequency range of your amplifier. The to this post, the other phone tip to the P post of the first audio transformer speak into the phone, your voice will be reproduced 400 times louder. But with many refinements. This system will disclose fairly accurate. You have tried this experiment on your set as is, insert a C battery and not you can't notice with your ear, however. The set shown here is a Neutro set in neutralization, the Neutroformers are mounted at an angle of 5 degrees to prevent

# ster''



or their precious habit this habit is normally . Y., is addressing a to the toy microphone, those workaday world path, where free-reined el.)

# King Talks



**KING ALFONSO** of Spain, makes his first appearance before the microphone. In Spain the microphone is covered with a cone-like arrangement that is supposed to give better transmission. (International Newsreel)

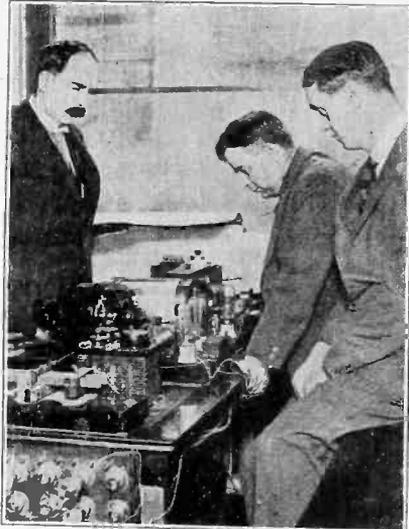
# Bori Broadcasts



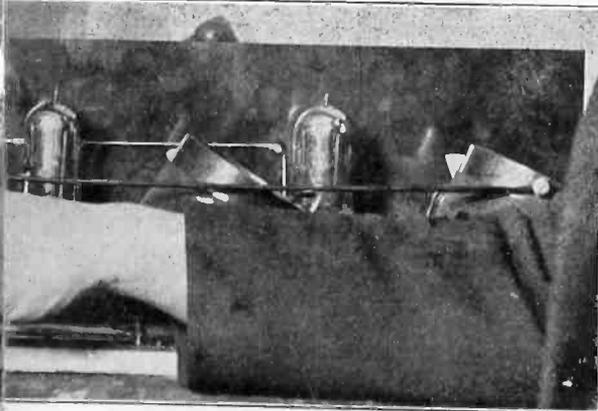
**MME. FRANCES ALDA**, lyric soprano of the Metropolitan Opera Company, who broadcast from WEAF and seven interconnected stations two weeks after the similar radio debut of John McCormack and Lucrezia Bori. Mme. Alda, wife of Giulio Gatti-Casazza, general manager of the Metropolitan, has a charming velvety voice. As one of the great singers signed up by the Victor Talking Machine Company for making records, and thus not permitted to sing before the microphone without their permission, she appeared at their request, and without pay. This was part of the Victor Company's experiment to determine whether such broadcasting will increase the sale of phonographs and records, hard hit by radio's growing popularity. On all sides there is evidence of the public's great appreciation of such high-class programs. The sudden growth in the demand for radio sets and parts, and no less for radio publications in the news-stands, that followed the broadcasting by McCormack and Bori on New Year's night was generally attributed to the public delight at the opportunity of having the voices of such great artists enter the home via the aerial. (Wide World)



loopy" Gang, Sunday EAF, is Julia Glass. she is considered one pianists. Since she with the National increasing honors.



**TRANSMITTING** photographs in London. The apparatus used is that employed in the recent transmission of photos across the Atlantic. The tests, as shown, are still going on.



il points to the B plus detector terminal. Hook one side of your phone er. The loudspeaker is plugged in to the last stage of AF. When you amplifiers that broadcast speeches to vast crowds utilize this system, w much your amplifier or loudspeaker distorts the voice. After you increased power, the better tone, plus the saving of B battery, which ne. To prevent losses through interacting currents, and to keep the wrees. The AF transformers are mounted at right angles to each other wling.



**HERE'S 2 ADF**, a typical transmitting amateur —one of the men who pave the way for better future radio. If you think that the upkeep of a receiver is expensive, try jumping into the transmitting game, as 5-watt tubes cost \$8 each, and many amateurs use the 50-watt bottles, and not a few the 250-watters. 50-watts at \$30 per and 250's at \$110 per, permit us to inform you that blowing transmitting tubes is expensive.

# BROADCAST PROGRAMS

## Thursday, January 22

**WDAF, Kansas City, Mo., 411 (C. S. T.)—3:30 P. M.**, the radio trio. 5:50, marketgram, weather, time and road. 6, reading, Cecile Burton; 4 P. M. **Edmund F. Boettcher**, tenor; **William H. McEaves**, pianist; **DeWitt McMurray**, philosopher. 6:45, Boy Scout weekly program. 8:30, North Dallas High School Band. 11, hotel orch.

**WOAI, San Antonio, Tex., 385 (C. S. T.)—9:30 P. M.**, Jimmy's Joys Orch.

**WMC, Memphis, Tenn., 500 (E. S. T.)—8 P. M.**, Bedtime Stories. 8:30, WMC celebrating second anniversary.

**EGO, Oakland, Cal., 312 (P. S. T.)—10:40 A. M.**, classroom instruction. 11:30, luncheon concert. 1:30 P. M., N. Y. and S. F. stock; weather. 4, concert orch. 6:45, final reading, stock reports, weather, S. F. produce news, and news items. 8, Y. W. C. A., assisted by the Arion Trio; **Robert W. Lovegren**, baritone; **Edith Gilman**, soprano; address, "Think It Over," **Coleman Cox**; **Josephine Holub**, violinist. 10:00, **Henry Halstead's** Orch.

**WLW, Cincinnati, O., 423 (C. S. T.)—8 A. M.**, "Setting Up" exercises. 10:45, weather and business reports. 12:15 P. M., **Woody Meyer's** orch. 1:30, business reports. 3, market reports. 4, piano recital by **Adelaide Apfel**; French lesson by **Madame Teinapidis**. 6, **Selinsky** instrumental quartet. 10, message from the U. S. Civil Service. 10:03, Cooper Corporation program; orchestral program; **Sinfonia Frat.**, College of Music, program; **Doherty**, Melody Boys.

**WBZ, Springfield, Mass., 337 (E. S. T.)—11:55 A. M.**, time, weather, market. 6 P. M., dinner concert. 7, market report. 7:05, bedtime story. 7:15, New England Homestead, "Preparation of Federal Income Tax Returns," **Thomas McCarry**. 7:30, educational course. 8, **Alberta Kelleher**, violinist. 8:15, **The Original Three Musicasters**; **Thomas Moran**, monologist; **James Brazed**, tenor; **Vincent A. Breglio**, pianist. 8:30, **George Leo Patterson**, on "The Coming Eclipse." 9, **Three Musicasters**. 9:15, **Charles E. Colley**, pianist; **Sandy MacDonald**, Scotch comedian; **Lenora Ferrari**, and **Jack Grin**, comedian. 9:30, Philharmonic trio. 9:45, continuation of program. 9:55, time, weather. 11, **Hotel Brunswick** orch. 11:30, popular song, **Don Ramsay's** Four. 11:45, **Hotel Brunswick** orch.

**WCAE, Pittsburgh, Pa., 462 (E. S. T.)—12:30 P. M.**, news, weather. 4:40, stock market; **The Sunshine Girl**. 6:30, dinner concert. 7:30, **Uncle Kaybee**. 7:45, special feature. 8, **alcant.** 8:30, concert by artists.

**KPO, San Francisco, 423 (P. S. T.)—7 A. M.**, setting-up exercises. 11:50, market report. 12, time. 1 P. M., **Rudy Seiger's** Orch. 4:30, **Rudy Seiger's** Orch. 5:30, children's hour. 7, **Rudy Seiger's** Orch. 8, organ by **Theodore J. Irwin**. 9, **Allen Music Co.** program. 10, **E. Max Bradford's** Versatile Band.

**WOR, Newark, N. J., 405 (E. S. T.)—7 A. M.**, morning gym class. 2:30 P. M., recital by **Lorraine Saylor**, contralto. 2:45, **Chester Sutta**, violinist. 3, contralto. 3:15, **Eddie Bauer's** orch. 6:15, **Albert E. Sonn**, "Radio for the Layman." 6:30, **Jimmie Lent's** society orch.

**WJZ, New York City, 455 (E. S. T.)—10 A. M.**, Housewives League daily menu; **Mrs. Julien Heath**. 10:20, Review of Reviews. 10:30, "Household Equipment," by **Ethel R. Peysor**. 10:40, Editor of Needle Art talk. 10:50, **Eleanor Gunn's** fashion talk. 11, "Planning to Spend," by **Mrs. Frances Searer**. 1 P. M., **Nathan Abas'** Hotel Pennsylvania orch. 4, **Hock & Jerome**, popular songs. 4:30, **Bernhard Levitow's** Hotel Commodore orch. 5:30, State and Federal agricultural reports; farm and home market reports; closing quotations of the New York Stock Exchange; foreign exchange; news. 7, **Bernhard Levitow's** Hotel Commodore orch. 7:55, "Menace of Money," by **John B. Kennedy**. 8, **Wall Street Journal** Review. 8:10, **NYU Air College**; "Mineral Wealth of the U. S.," by **E. R. Lilley**. 8:25, "Learn a Word a Day." 8:26, "Billy," a comedy by **WGY** Players. 10:30, **Joseph Knecht's** Waldorf Astoria dance orch.

**WOO, Philadelphia, 509.9 (E. S. T.)—11 A. M.**, grand organ. 11:30, weather. 11:55, time. 12, Tea Room orch. 4:40 P. M., police reports. 4:45, grand organ and trumpets. 9:55, time. 10:02, weather.

**KDKA, E. Pittsburgh, Pa., 326 (E. S. T.)—9:45 A. M.**, stockman reports. 11:55, time. 12, weather, stockman reports. 12:20 P. M., Institute at Trinity Church. 3:30, closing quotations on hay, grain and feed. 6:15, **KDKA Little Symphony** orch. 7:15, stockman reports. 7:30, **Uncle Ed**, 8, program arranged by the National Stockman and Farmer. 8:30, **KDKA Little Symphony** orch. 9:55, time. 11, concert from the Pittsburgh Post studio.

**KFDY, Brookings, S. D., 273 (C. S. T.)—8 P. M.**, concert by State College orch. 8:20, "Engineering Training for South Dakota Students," talk by **H. M. Crothers**, head of electrical engineering department. 8:30, vocal solos by **Mrs. P. E. Michelson**. 8:40, "The Farmer's Interest in the Stabilized Dollar," talk by **V. R. Wertz**, farm economics department. 8:50, special numbers by State College orch.

**WEAF, New York City, 492 (E. S. T.)—11 A. M.**, musical program, talks to housewives, market

and weather. 4 P. M., **Gertrude Casriel**, pianist; talk by **Mrs. Clarence R. Hyde** on Historical Houses. 6, dinner music; mid-week services; art talk; **Union Hill Elks Club** quartet; **Columbia University** Course on Contemporary English Fiction, by **Professor Dorothy Brewster**; touring; **Winifred Bauer**, pianist; **Jaeha Fishberg** String Quartet; **Mabelanna Corby** with **Janet Bush-Hecht**, soprano; **Elsie John Holland**, violinist; **Charles Rivers**, baritone, and **Anita Dietrich Knip**, soprano; **Vincent Lopez** and his orch.

**KYW, Chicago, 536 (C. S. T.)—6:30 A. M.**, morning exercises. 9:30, late news and comment of the markets; 10:30, farm and home service. 11:35, table talk, by **Mrs. Anna J. Peterson**. 2:35 P. M., "Studio Frolic." 6:02, news, financial and final markets. 6:35, children's bedtime story; dinner concert. 7, **Joska DeBabary's** orch. 7:10, **Coon-Sanders Original Nighthawks**. 7:20, **Joska DeBabary's** orch. 8, "Twenty Minutes of Good Reading," by **Rev. C. J. Pernin**. 8:20, **Ethel Jordan**, soprano; **H. W. "Sen" Kaney**; **Sallie Menkes**, pianist; **A. Ranney Johnson**, tenor; **Jane Johnson**, accompanist. 9:15, "Good Roads" report. 10, "Evening at Home."

**KOA, Denver, Colo., 323 (M. S. T.)—1 P. M.**, N. Y. stock reports, livestock, fruit and vegetable report and weather. 6 P. M., final reading, stock reports, livestock, vegetables and late news.

**WIP, Phila., 509 (E. S. T.)—1 P. M.**, **Gimbel Tea Room** orch. 1:30, weather. 3, artist recital by the **Sternberg School of Music**; **Helen McCarthy**, pianist; **Alma Hertzog**, vocalist; **Mildred Creighton**, violinist. 6, weather. 6:05, dinner music by **Art Coogan** and his **Club Madrid** orch. 7, **Uncle Wip's** roll call and birthday list. 8, the **Philadelphia Civic Opera** Company in a performance of "Carmen." 11, dance music by **Harvey Marburger** and his **vaudeville** orch.

**WGY, Schenectady, 380 (E. S. T.)—6:30 P. M.**, dinner hour program. 7:45, "A Few Moments With New Books," by **William Jacob**, librarian. 8:30, comedy, "Billy." 11:30, organ recital by **Stephen E. Boisclair**.

**CKAC, Montreal, Can., 425 (E. S. T.)—4 P. M.**, weather and stock market. 4:45, **Windsor Hotel** dance orch. 8:30, **Canadian National Railways** using **CNRM**.

**WRC, Washington, D. C., 469 (E. S. T.)—6:45 P. M.**, children's hour. 7, dinner music. 8, talk. 8:25, "Billy," by the **WGY** Players. 10:30, dance music.

## Friday, January 23

**WGBS, New York City, 316 (E. S. T.)—6:30 P. M.**, **Abner J. Gelula**, Technical Editor, **Radio World**, weekly talk on "Radio Hooks and Advice."

**WOR, Newark, N. J., 405 (E. S. T.)—7 A. M.**, morning gym class. 2:30 P. M., **Irma Fensel**, lyric soprano. 2:45, **Edna Falk**, monologist. 3, **Irma Fensel**. 3:15, "45 Minutes with the 'Pigs' Company." 6:15, **Vincent R. Stortz**, pianist. 6:30, "Man in the Moon" stories. 7, **Vincent R. Stortz**, pianist.

**WFAA, Dallas, Tex., 476 (C. S. T.)—12:30 P. M.**, address, **Dr. Robert Stewart Hyer**. 4:30, woman's hour. 8:30, **Wilmer Male Quartet**.

**WDAF, Kansas City, Mo., 411 (C. S. T.)—3:30 P. M.**, the radio trio. 5:50, marketgram, weather, time and road. 6, speaker; **Tell-Me-a-Story** Lady; **The Trianon Ensemble**. 8, popular program. 11:45, **Nighthawk Frolic**.

**KFAE, Pullman, Wash., 630 (P. S. T.)—7:30 P. M.**, Hawaiian songs and music; **Hula Harmonizers**; **Washington 4-H Clubs** at **Chicago**, **Miss Elmira White**; **Essentials of Successful Farm Management**, **Geo. Severance**; **Book Reviews**, **Alice L. Webby** Reading in Preparation for Travel in Europe, **Prof. Carl M. Brewster**.

**WMC, Memphis, Tenn., 500 (E. S. T.)—8 P. M.**, Bedtime Stories. 8:30, **Prof. Chia Chia** and his **Birling's** Orch. 11, **Midnight Frolic**.

**KGO, Oakland, Cal., 312 (P. S. T.)—11:30 A. M.**, luncheon concert. 1:30 P. M., N. Y. and S. F. stock and weather. 5, musical program and speaker. 4, concert orch. 5:30 to 6, **The Girl's Half Hour**, by **Kather W. Schneider**. 6:45, stock reports, weather, S. F. produce news, and news. 8, lecture by **Richard J. Davis**.

**WBZ, Springfield, Mass., 337 (E. S. T.)—11:55 A. M.**, time, weather, market. 7, market report. 7:05, bedtime story.

**WLW, Cincinnati, 423 (C. S. T.)—8 A. M.**, "Setting Up" exercises. 10:45, weather and business reports. 12:15 P. M., **Woody Meyer's** orch. 1:30, business reports. 3, market reports. 4, **Mr. Leo Stofregren's** pupils program; French lesson by **Madame Teinapidis**.

**WHO, Des Moines, Ia., 523.3 (C. S. T.)—7:30 P. M.**, **The Williams Bros.**; **Arthur Cohen**, violinist; **Rudy Bale**, popular soloist; **Roy Beggs**, pianist; **Margaret Young**, accompanist.

**WCAE, Pittsburgh, Pa., 462 (E. S. T.)—12:30 P. M.**, weather. 4:30, **Sunshine Girl**; stock market. 6:30, dinner concert. 7:30, **Uncle Kaybee**. 8, **alcant.** 8:30, short vocal program; concert by the **Astor Coffee** orch.

**KPO, San Francisco, 423 (P. S. T.)—7 A. M.**, setting-up exercises. 11, "Home Making." 11:50, market report. 12, time. 12:45 P. M., talk. 1, **Rudy Seiger's** Orch. 4:30, **Rudy Seiger's** Orch.

**WEAF, New York City, 492 (E. S. T.)—11 A. M.**, musical program, talks to housewives, health talk, market, weather. 4 P. M., **Misses Sarah Paris** and **Ethel Feitman**, pianists; lessons in French. 6, dinner music; children's stories, by **Blanche Elizabeth Wade**, of the **G. R. Kinney** Company story teller; **The Happiness Candy Boys**; **Hohner Harmony Hour**; **B. Fischer** and Company's **Astor Coffee** dance orch.; **Metropolitan Master Quartet**; **Princess Athena's** Oriental orch.; **Meyer Davis' Lido Venice** orch.

**KYW, Chicago, 536 (C. S. T.)—6:30 A. M.**, morning exercises. 9:30, late news and comment. 11:35, table talk, by **Mrs. Anna J. Peterson**. 6 P. M., news, financial and final markets; **Dun's** and **Bradstreet's** Weekly Review. 6:35, children's bedtime story. 7, **Joska DeBabary's** orch. 7:10, **Coon-Sanders Original Nighthawks**. 7:20, **Joska DeBabary's** orch. 8, speeches under the auspices of the **American Farm Bureau**. 9, midnight revue. 11, midnight revue cont'd; this is a **Westinghouse**.

**KOA, Denver, Colo., 323 (M. S. T.)—1 P. M.**, N. Y. stock reports, livestock, fruit and vegetable report and weather. 6, final reading, stock reports, livestock, vegetables and late news. 6:40, **Book of Knowledge** program. 8, studio program.

**WIP, Phila., 509 (E. S. T.)—1 P. M.**, **Gimbel Tea Room** orch. 1:30, weather. 3, "A Diet for Anemics," by **Mrs. Anna B. Scott**. 3:15, artist recital by the **Frank Oglesby Studio**; **Seel Guldin**, soprano; **Flora Maughn**, contralto; **Warren Armstrong**, tenor; **Frank Boehret**, tenor; **Frank Oglesby** at the piano. 6, weather. 6:05, popular numbers by **Mark Fisher** and **Joe Burke**. 6:15, **Harvey Marburger** and his **vaudeville** orch. 6:45, U. S. Department of Agriculture, livestock and produce market reports. 7, **Uncle Wip's** bedtime story, roll call and birthday list.

**WGY, Schenectady, 380 (E. S. T.)—7:45 P. M.**, health talk. 8, "Growing Importance of Foreign Languages to Americans," **Dr. Morton C. Stewart**. 8:15, program by **WGY** orch. 10:30, recital by **Zoltan Szekely**, violinist.

**KDKA, E. Pittsburgh, Pa., 326 (E. S. T.)—7 A. M.**, morning exercises. 8, morning exercises. 9:45, stockman reports. 11:55, time. 12, weather. 12:20 P. M., **Sunday School** lesson. 3:30, quotations on hay, grain and feed. 6:15, concert. 7:15, stockman report. 7:30, **Daddy Winkum**. 8:15, "More Novels," discussion of literature, by **Mrs. F. P. Mayer**. 8:30, church quartet, **Etta Cunningham**, soprano; **Mary Reese Wilson**, contralto; **Chester Humphries**, tenor and director; **Arthur Anderson**, bass. 9:55, time, weather, baseball scores.

**WRC, Washington, D. C., 469 (E. S. T.)—4 P. M.**, fashion developments of the moment, **Eleanor Gunn**. 4:10, piano recital, **Eleanor Glynn**. 4:20, "Beauty and Personality," **Elsie Pierce**. 4:30, **Meyer Davis' Trio**. 6, children's hour.

**WOO, Phila., 509.9 (E. S. T.)—11 A. M.**, grand organ. 11:30, weather. 11:55, time. 12, Tea Room orch. 4:40 P. M., police reports. 4:45, grand organ and trumpets. 7:30, police reports, dinner music by **A. Candelori**. 8:30, musical program. 9:25, to be announced. 9:55, time. 10:02, weather. 10:30, dance program by **Vincent Rizzo** and his **Hotel Sylvania** orch.

**CKAC, Montreal, Can., 425 (E. S. T.)—1:45 P. M.**, **Windsor Trio**. 4, weather and stock market. 4:30, **Ilo** lessons.

**WJZ, New York City, 455 (E. S. T.)—10 A. M.**, Housewives League menu. 10:20, book review, **Grace Colbron**. 10:30, "Health and Beauty," by **Ruth Champenois**. 10:50, **Eleanor Gunn's** fashion talk. 1 P. M., **Hotel Ambassador Trio**. 4:30, **Hotel Belmont** tea music. 5:30, State and Federal agricultural reports, farm and home market reports, foreign exchange, **Evening Post** News. 7, **Erdody's Park Lane** orch. 8, **Wall Street Journal** Review. 8:10, **NYU Air College**, "Public Speaking." 8:40, "Word a Day." 8:45, **Samuel S. Aronson**, pianist; **Beatrice Borow**, soprano. 9, "Incidents Making Me Laugh," by **George Laval Chesterton**. 9:15, U. S. Navy Night. 10, "Radio and the Solar Eclipse," by **Orrin E. Dunlap, Jr.** 10:30, **Beaux Arts** orch.

## Saturday, January 24

**WEAF, New York City, 492 (E. S. T.)—4 P. M.**, **Willie Bruno** and his orch. 6, dinner music; stories for boys, by **Fred J. Turner**; male chorus of **Princeton Seminary**; **Schubert** String Trio; **Feliam Garzia**, pianist; **Waldorf-Astoria** orch.; **Alice Sievers**, pianist, and **Louise Vermont**, contralto; **Warren Scofield**, baritone; **Vincent Lopez** and his orch.

**WOR, Newark, N. J., 405 (E. S. T.)—7 A. M.**, gym class. 8, test during the **Solar Eclipse**. 2:30 P. M., **Manhattan male trio**. 2:45, **Paolo del Pino**, operatic tenor. 3, **Manhattan male trio**. 3:15, **Paolo del Pino**, operatic tenor. 3:30, **Papp's** orch. 6:15, **Hickey Rettig's** orch. 8, **Schubert** string quartet. 8:30, **J. P. E. Hardenbergh**, "The New Things in Newspaperdom." 8:45, **Frank LaForge**, composer-pianist program. 9:45, **E. E. Free**, Ph.D., "Some Things We Learned from the Eclipse," 10, joint recital by **Oscar Nicastro**, cellist, and **Rita de Simone**, dramatic soprano. 11, **Harry Cox** orch.

**KYW, Chicago, 536 (C. S. T.)—6:30 A. M.**, morning exercises. 9:30, late news and comment. 10:30, farm and home service. 11:35, table talk, by **Mrs. Anna J. Peterson**. 6:18 P. M., news, financial and final markets. 6:35-7, children's bedtime story. 7, **Joska DeBabary's** orch. 7:10, **Coon-Sanders Original Nighthawks**. 7:20, **Joska DeBabary's** orch. 8-8:58, **Harrison Tech High School** Band. 9:05, **Youth's Companion**. 9:35-11:30, **Congress** Classic. 12-2, **Congress** Carnival.

**WMC, Memphis, Tenn., 500 (E. S. T.)—8 P. M.**, Bedtime Stories. 8:30, program by **Hugh Sandige**. **WDAF, Kansas City, Mo., 411 (C. S. T.)—3:30 P. M.**, The Radio Orch. 5:50, marketgram, weather, time and road. 6, message from **Roger W. Babson**; **Tell-Me-a-Story** Lady; **The Trianon Ensemble**.

**WFAA, Dallas, Tex., 476 (C. S. T.)—12:30 P. M.**, **More Cotton** per **Acro Contest**. 8:30, **Walter J. Fried** in **viola** recital. 11, **Adolphus Hotel** Orch.

**KGO, Oakland, Cal., 312 (P. S. T.)—11:30 A. M.**, luncheon concert. 12:30 P. M., final reading, stock

Tuesday, January 27

reports and weather. 4, concert orch. 8, program given by the Oakland Realtors' Glee Club, Zura E. Bells, director; assisted by Elizabeth Johnstone Wastell, accompanist; Edna Fischer Hall, contralto; Willy Meier Pausellus, guitarist. 10, dance music.

**WBZ, Springfield, Mass., 237 (E. S. T.)—8 A. M.**, special test during eclipse of the sun. 11:55, time, weather. 6 P. M., Leo Reisman's ensemble. 6:45, George Rogers, popular songs. 7, market report. 7:05, bedtime story. 7:15, sketches from U. S. history. 7:30, concert by the Hotel Kimball trio. 8, broadcast from Boston Arena, Harvard-Princeton hockey. 9:35, time, weather.

**WLW, Cincinnati, O., 423 (C. S. T.)—8 A. M.**, "Setting Up" exercises. 10:45, weather and business reports. 1:30 P. M., market reports. 3, Hubert Buschle's orch. 6, Selinsky instrumental quintet; Lafone by E. D. Leonard.

**WCAE, Pittsburgh, Pa., 462 (E. S. T.)—12:30 P. M.**, news, weather. 2:30, tea-dansant music. 4:30, Ed Lally's Rendezvous Cabaret orch. 6:30, dinner concert. 7:30, Uncle Kaybee. 7:45, movie chats. 8, news and road conditions. 8:15, silent. 8:30, musical program.



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**KPO, San Francisco, 423 (P. S. T.)—7 A. M.**, setting-up exercises. 11:50, market report. 12, time. 1 P. M., Rudy Seiger's Orch. 2:30, California Grays. 4:30, E. Max Bradford's Versatile Band. 8, Art Weidner's Dance Orch.

**KOA, Denver, Colo., 323 (M. S. T.)—1 P. M.**, N. Y. stock reports, livestock, weather. 9, Joe Mann and his Rainbow-Lane orch.

**WJZ, New York City, 455 (E. S. T.)—11 A. M.**, American orch. 1 P. M., Erdody's Park Lane orch. 4, "The Texans," Sanchez and Millstead. 4:30, Sherry's Tea orch. 5:30, State and Federal agricultural reports, farm and home market, New York Stock Exchange, foreign exchange, Evening Post News. 7, Joseph Knecht's dance orch. 8, "Art for Laymen," by Walter M. Grant. 8:15, "Learn a Word a Day." 8:20, Nora Helms, soprano; Keith McCloed, accompanist. 8:30, "How Motion Pictures Are Made," by Alfred B. Hitchens. 8:45, Nora Helms, soprano. 9, Course on Jewish History and Literature. 9:30, Washington Square College Players. 10:30, Hotel Astor dance orch.

**WIP, Phila., 509 (E. S. T.)—1 P. M.**, organ recital. 1:30, weather. 3, "Pep" Williams Entertainers. 6, weather. 6:05, Hotel St. James orch. 6:45, U. S. Department of Agriculture. 7, Uncle Wip's bedtime story. 8, the greatest surprise feature ever on the air.

**WGY, Schenectady, 380 (E. S. T.)—9:30 P. M.**, Phil Romano and his orch.

**KDKA, E. Pittsburgh, Pa., 326 (E. S. T.)—9:45 A. M.**, stockman reports. 11:55, time. 12, weather, stockman reports. 1:30 P. M., concert by Daugherty's orch. 6, dinner concert. 7:30, Richard, the Ridder. 8:30, concert by the Westinghouse Band. 9:55, time, weather. 10, hockey scores.

**WRC, Washington, D. C., 469 (E. S. T.)—6:45 P. M.**, children's hour. 7, Boornstein orch. 8, Bible talk. 8:15, to be announced. 8:30, talk. 9, W. Alfred Falconer in Dialect Stories. 9:55, time. 10:30, Astor Hotel orch. 11:15, organ recital by Otto Beck.

**WOO, Philadelphia, 509.9 (E. S. T.)—11 A. M.**, grand orch. 11:30, weather. 11:55, time. 12, Tea Room orch. 4:40 P. M., police reports. 4:45, grand organ and trumpets. 9:55, time. 10:02, weather.

**CKAC, Montreal, Can., 425 (E. S. T.)—7 P. M.**, kiddies' stories. 7:30, Windsor Hotel dinner concert. 8:30, University of Montreal "College Entertainment." 10:30, Windsor Hotel Red Jockets' orch.

organ. 11:30, weather. 11:55, time. 12, Tea Room orch. 4:40 P. M., police reports. 4:45, grand organ and trumpets. 7:30, police reports; A. Candelori and his orch. 8:30, musical program by the Moore School orch. 9, Metropolitan male quartet. 9:55, time. 10:02, weather. 10:03, dance program, orch. 10:30, Vincent Rizzo and orch.

**WBZ, Springfield, Mass., 337 (E. S. T.)—11:55 A. M.**, time, weather, Springfield market. 6 P. M., Westinghouse Philharmonic trio. 7, market report. 7:05, bedtime story. 7:15, "Bringing the World to America." 7:45, Charles R. Hector with his orch. 8:15, Barbara Smith, soprano, and C. E. Bell, baritone, accompanied by Mary Clifford. 8:30, Mrs. Miriam Munyan Thomson, pianist. 8:45, Antha Munsell Root, soprano, acc. by Mrs. Miriam Munyan Thomson. 9, Aleppo drum corps. 9:30, Helen Kraft, entertainer. 9:45, Westinghouse Philharmonic trio. 9:55, time, weather. 11:30, McEnelly's singing orch.

**WEEI, Boston, 303 (E. S. T.)—2 P. M.**, Crystal Lake orch. 6:30, Big Brother Club. 7, Dok-Eisenbourg and his Sinfonians. 8, Macedonian Male Quartet. 8:45, "Buddy's Bostonians."

**WEMO, Barrien Springs, Mich., 286 (C. S. T.)—8:15 P. M.**, concert; travlogue, by Paul Nelson Pearce.

**WHO, Des Moines, Ia., 522 (C. S. T.)—7:30 P. M.**, Stewart Watson. 8, classical program.

**WHAS, Louisville, Ky., 400 (C. S. T.)—4 P. M.**, selections played on the Alamo Theater organ; police bulletins; weather; three-minute talk, Wendell Hall, "Just Among Home Folks"; readings. 4:55, local livestock, produce and grain market. 5, time.

**WWJ, Detroit, 517 (E. S. T.)—8 A. M.**, setting-up exercises. 9:30, "Tonight's dinner" and a special talk. 9:45, public health service bulletins. 10:25, weather. 11:55, Arlington time. 3:50 P. M., weather. 3:55, market reports. 8:30, the Detroit News orch.

**WOO, Philadelphia, 510 (E. S. T.)—11 A. M.**, organ. 11:30, weather. 11:55, time. 12, Tea Room orch. 4:40 P. M., police reports. 4:45, organ and trumpets. 9:55, time. 10:02, weather.

**WHO, Des Moines, Ia., 522 (C. S. T.)—2:15 P. M.**, Pathe News.

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

**WWJ, Detroit, 517 (E. S. T.)—8 A. M.**, setting-up exercises. 9:30, "Tonight's dinner" and a special talk. 9:45, Fred Shaw, pianist and popular songster. 10:25, weather. 11:55, time. 3, News orch. 3:50, weather. 3:55, market. 8:30, the Adanac Male Quartet; Mrs. John McDermott, soprano.

**WHAS, Louisville, Ky., 400 (C. S. T.)—4 P. M.**, organ, police, weather; "Just Among Home Folks"; readings. 4:55, livestock, produce and grain reports. 5, time. 7:30, concert by the Rosson Entertainers; a chapter of the "Billy and Jane" stories; Wendell Hall; news; time.

**KGO, Oakland, Cal., 312 (P. S. T.)—11:30 A. M.**, luncheon concert. 1:30 P. M., N. Y. and S. F. stock reports, weather. 4, concert orch. 6:45, stock reports, weather, S. F. produce news, and news. 8, Pacific Junior Concert orch.

**KGW, Portland, Ore., 492 (P. S. T.)—11:30 A. M.**, weather. 12:30 P. M., concert. 5, children's program. 7:15, markets, weather, news, police reports. 8, lecture, A. C. Boquet, "Glass—A Vegetable Garden Asset." 8:30, concert. 10, Multnomah Hotel Strollers.

Wednesday, January 28

**WOO, Philadelphia, 510 (E. S. T.)—11 A. M.**, organ. 11:30, weather. 11:55, time. 12, Tea Room orch. 4:40 P. M., police reports. 4:45, organ and trumpets. 9:55, time. 10:02, weather.

**WHO, Des Moines, Ia., 522 (C. S. T.)—2:15 P. M.**, Pathe News.

**WEEI, Boston, 303 (E. S. T.)—6:30 P. M.**, Big Brother Club. 7, Shawmut Juvenile Syncopators. 7:45, Harry Einstein. 8, musicale. 9, dance orch. 10, program by Ernest A. L. Hill. 11, organ recital.

**WHO, Des Moines, Ia., 522 (C. S. T.)—6:30 P. M.**, the Reese-Hughes orch. 7:30, Bankers' Life Radio orch.; Evelyn Fowler, pianist; Mr. P. J. Louberge, French soloist. 9, Symphonic orch.

**WWJ, Detroit, 517 (E. S. T.)—8 A. M.**, setting-up exercises. 9:30, "Tonight's dinner." 9:45, health bulletins. 10:25, weather. 11:55, time. 3:50 P. M., weather. 3:55, market. 8:30, News orch.; Templeton Moore, tenor.

**WHAS, Louisville, Ky., 400 (C. S. T.)—4 P. M.**, Alamo Theater organ, police bulletins, weather; "Just Among Home Folks"; readings. 4:55 P. M., local livestock, produce and grain market. 5, time. 7:30, orch.; a chapter of "Billy and Jane," Wendell Hall, time.

**KGO, Oakland, Cal., 312 (P. S. T.)—11:30 A. M.**, luncheon concert. 1:30 P. M., N. Y. and S. F. stock reports, weather. 3, music program. 4, concert orch. 6:45, final reading, stock reports, weather, S. F. produce news, and news.

**KGW, Portland, Ore., 492 (P. S. T.)—11:30 A. M.**, weather. 12:30 P. M., concert. 5, children's program. 7:15, markets, weather, news bulletins, police reports, 8, concert. 10, Multnomah Hotel Strollers.

**WEMO, Barrien Springs, Mich., 286 (C. S. T.)—8:15 P. M.**, miscellaneous program.

**WEEI, Boston, 303 (E. S. T.)—2 P. M.**, Joe Ryan's Internationals. 6:30, Big Brother Club. 7, Shawmut Juvenile Syncopators. 7:45, Harry Einstein. 8, musicale. 9, dance orch. 10, program by Ernest A. L. Hill. 11, organ recital.

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Thursday, January 29

**WOO, Philadelphia, 510 (E. S. T.)—11 A. M.**, organ. 11:30, weather. 11:55, time. 12, Tea Room orch. 4:40 P. M., police reports. 4:45, organ and trumpets. 9:55, time. 10:02, weather.

**WHO, Des Moines, Ia., 522 (C. S. T.)—2:15 P. M.**, Pathe News.

**WEEI, Boston, 303 (E. S. T.)—6:30 P. M.**, Big Brother Club. 7, Shawmut Juvenile Syncopators. 7:45, Harry Einstein. 8, musicale. 9, dance orch. 10, program by Ernest A. L. Hill. 11, organ recital.

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(Concluded on page 23)

Monday, January 26

## A THOUGHT FOR THE WEEK

THERE'S many a wise radioist who knows all about Mendelssohn and Gounod now but who formerly believed that Irving Berlin composed "The Spring Song" and "Ave Maria."

# RADIO WORLD

From 8.15 to 9 P.M. O.K.



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(Dated Saturday of same week)

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## ADVERTISING RATES

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JANUARY 24, 1925

A Radio World.



AERIALS, aerials, aerials; that's what the whole wide world is coming to, or is already. So much the better.

## Nothing the Matter With Radio; Some Foolishly Shy Over It, That's All, Say Farmers

**Within the Past Year the Number of Sets in Use on Farms Has Risen to 364,800, or Nearly Doubled—Ignorance of Installing or Operating a Set, Fear of Present Apparatus Going Out of Date and "Luxury" Prices Listed as Three Main Reasons for Ruralites Not Having Receivers—Experts Reply—First-hand Reports of Marvelous Material and Social Benefit of Radio.**

A NATIONAL survey is being conducted by RADIO WORLD to determine why radio, now ranking thirty-second as an industry, is not nearer the top, as its greatness deserves, and why nearly 80% of the homes in the United States have no radios. This week the farmers' views are presented. Readers of RADIO WORLD are requested to send in their reasons. Letters thus received and published will be paid for at usual rates. Address Survey Editor, RADIO WORLD, 1493 Broadway, New York City.

By Thomas Stevenson

WASHINGTON.

WILL radio accomplish something that has been a source of great concern to leaders in our national economic life as well as to the farmers themselves, namely, keep the boys and girls down on the farm?

No one can accurately answer the question at this time. But judging from letters written by farmers to the Department of Agriculture, the radio has opened up a new era for people living in small communities, while boys and girls seem a trifle less anxious to desert the old home town for the gayer life of the city.

This also is the opinion of officials of the Department of Agriculture who make it their business to keep in close contact with the farmers and the conditions under which they labor. These men believe a radio set is a necessity and that there should be one on every farm.

To the end of encouraging use of radio by farmers, the Bureau of Agricultural Economics recently made a survey of the extent of use of radio on farms. From the results of this survey, it was estimated that the total number of sets on farms has doubled within the past year; that there are now 364,800 farms with radio sets, compared to 145,350 last year.

## Three Outstanding Reasons

The survey also revealed that there are three outstanding reasons why a number of farmers do not get radio sets. In the order of their importance, these are:

1. Many farmers do not know how to operate a radio set, or how to set it up for operation.
2. Many farmers fear that if they buy a set it may be out of date within six months.
3. The radio is still classed as a luxury by many farmers, instead of a necessity. These farmers are waiting for more favorable circumstances before purchasing a set.

If the farmer buys his set assembled,

he should have no trouble at all in setting it up for operation. Only two things are necessary: to construct an aerial, a ground, and hook them to the set, which almost any boy can do.

## Good For Many Years

Some of the best radio engineers in the country, and of the world for that matter, have recently informed the writer that they believe the present day radio set will be "up to date" for many years. Of course, there will be many improvements in the construction of sets, such as simplicity of tuning, increased selectivity, different hook-ups employed, etc. But none of these will render the present-day radio set obsolete.

Because of weather reports, market news and other valuable information which can be obtained by the farmer with a radio set, officials of the Department of Agriculture class it as a necessity. But the best viewpoint on this subject is that of the farmer himself. Here are a few of the letters which have been pouring into the Department of Agriculture which go to show how many farmers regard radio sets:

**J. W. Barnes, Crane, Mo.**—"Radio helps the farmers in market reports because the radio tells the truth and the market manipulators tell everything but the truth to farmers, so let's have the truth as it will save the farmers from so many sheriff's sales."

**Miss Carrie Nicols, Belmont, Wis.**—"Radio is a great investment for the farmer for pleasure or business. He hears scientific talks on farming from great colleges, weather reports that guide each day's work, and protect against storm and frost so the farmer can save his crops. The radio also tells him when and where to ship to get the biggest prices for his products."

**J. N. Williams, Fromberg, Mont.**—"Last fall when the sheep were all sheared and the wool sacked and ready to ship, I wrote out a telegram to a Boston commission firm saying that I would sell my wool at that day's prices. But before sending it I heard the market quotations saying wool was very firm and higher prices expected. I held that telegram over night and sold the next day at a two cents per pound rise which realized about \$1,200 for me."

**Mrs. Romena W. Phares, Dallas, Texas.**—"To our family, radio is one of the greatest blessings of this age and it has made what might have been unbearable our life on the farm most pleasant. The weather, market and health reports have been invaluable."

**Ernest G. Gilmore, Bloomington, Kan.**—"We owe the saving of my brother's life to our radio set. Why? Because we heard the weather report which would not otherwise have been received and we got the doctor to him before a storm took down all the telephone wires and made the roads impassable."

**D. Coalson, Brownwood, Texas.**—"Farmers and stock men do not enjoy in their communities the advantages of splendid educational institutions offered the city folk. Every week I pick up wonderful lectures, talks and discussions. The topics discussed tend to broaden and enlighten us fellows living far out from the city. The radio helps to keep the boys down on the farm. I would not part with my set for twice its price if I could not get another."

**Mrs. Henry L. Schmidt, Cumberland, Wis.**—"We live 18 miles from our church (Concluded on page 24)"

# The Radio Trade

## \$22,000,000 Sales by R. C. A. In Last Two Months of 1924 Set Record

SALES of radio sets and parts by the Radio Corporation of America reached the record-breaking total of \$22,000,000 for the two months of November and December, according to estimates based on figures available for that period, but upon which company officials refused to comment. The two months' total as estimated may be compared with the gross income from sales, communications and other income for the three months ended Sept. 30, 1924, which was \$11,183,379. The figures are nearly as large as the \$23,000,000 gross income from sales of radio apparatus reported for the entire year 1923, and approximately as large as the company's sales for the previous ten months.

In other words, the popular demand for wireless receiving apparatus, as well as station demand for broadcasting paraphernalia is expected to show for the Radio Corporation in 1924 a total gross income exceeding \$45,000,000, or virtually double that of 1923, which itself set a record. The last quarterly report of the corporation for 1924 has yet to be issued. Until the stock was listed on the New York Stock Exchange last October no quarterly earning statements were available, and only the September quarter's report has been issued in conformity with the rules of the Exchange.

### A \$350,000,000 Year

Total radio sales by all companies for 1924 have been estimated by David Sarnoff, Vice President and general manager of the Radio Corporation, as \$350,000,000. This would compare with total sales of \$120,000,000 for 1923, \$60,000,000 for 1922 and \$5,000,000 for 1921. In 1920 the sales of all companies amounted to \$2,000,000. Mr. Sarnoff has predicted that sales in 1925 will reach \$450,000,000, based on the rate of increased demand in the preceding five years.

The Radio Corporation's report for the September quarter showed estimated surplus profits for that period of \$1,200,284.

### Dubilier's Shares 500,000

Stockholders of the Dubilier Condenser and Radio Corporation at a special meeting approved the proposal of the management calling for an increase in the company's no par value common stock from 160,000 to 500,000 shares. The company will sell part of the increased common stock to shareholders at \$50 a share on the basis of one share of the new stock for each ten shares now held. The proceeds from the sale of this stock will be used to retire all outstanding preferred stock at \$105 a share.

Following the sale of the common stock and completion of the retirement of all the preferred stock, the common stockholders will then be given the privilege of exchanging their present holdings of stock on the basis of one share of old stock for two shares of new stock.

Stockholders of record Jan. 2 have been given warrants evidencing their privilege to subscribe to the new stock at \$50 a share. These warrants expire on Jan. 15. Application will be made to have the new stock listed on the New York Stock Exchange.

### Freshman to Pay Dividend

Announced by Charles Freshman that a dividend would be paid on that stock within a short time caused an advance in the market price of the stock.

Trading started on the Curb Market in the shares of David Grimes Radio and Cameo Record Corporation.

### THE WOOD RADIO CALIBRATION CHART

WOOD'S Radio Calibration Chart, published by the International Up-To-The-Minute Radio Chart Exchange, 211-14 Patterson Bldg., Fresno, Cal., fills a need in radio logs. It provides a key to the dial settings on your set for any existing station. This chart will tell you with amazing closeness where you will find a certain station on the tuning dial. If your set is sensitive enough, the chart will point the way.

On the back of the chart is a list of the larger broadcasting stations listed according to wavelength so that, in connection with the chart, you may check up on its accuracy.

COMPLETE 1924 INDEX OF RADIO WORLD, appeared in RADIO WORLD dated Oct. 18, 1924, and Jan. 10, 1925. 15c per copy. RADIO WORLD, 1493 B'way, N. Y.

WORLD WONDER ONE-TUBE RADIO SET, range 1,000 miles, special \$10.50. Distributors wanted. A. Bram, Woodbridge, N. J.

## Exports for 1924 \$5,000,000; Up 50%

RADIO exports during 1924 probably exceeded \$5,000,000, according to incomplete figures prepared by the Department of Commerce. This is nearly twice the amount of exports for 1923. The figures show that Canada is the principal foreign buyer of American radio sets and apparatus. Exports to Mexico increased throughout the year while Cuba was a growing market during the entire year. South America has been a generous purchaser of American sets while exports to Australia and New Zealand also showed a big increase.

"As has been true since radio assumed a commercial role," says the Department of Commerce, "the exportation of storage batteries, both primary and secondary, again showed a decided increase in 1924 over that of the previous year. In the case of primary batteries, however, the increase in the shipments of flashlights—\$692,307 gain was probably due principally to the market for the first eleven months of 1924 as against \$455,361 for the same period of 1923.

"Of special interest is the radio business itself, which, due largely to the ever-growing market caused by the dissemination of radio knowledge throughout the world, together with the ever-growing tendency in other countries to remove restrictive measures that have hampered the manufacture and use of radio, and the greater freedom granted to broadcasting stations in operation and under process of construction, by each foreign government in question, have also contributed toward making our 1924 exports in this class practically twice that of 1923. Our radio exports, by value, for the year just passed will undoubtedly exceed \$5,000,000."

## Canadian Sales Hit New Record for Yuletide

OTTAWA.

ALL previous Canadian sales records for radio sets and accessories were surpassed during this year's Christmas business, Assistant U. S. Trade Commissioner T. W. Donnelly reports. The availability of the leading broadcasting stations in the United States and the principal stations in Canada affords local enthusiasts greater scope for operation. The rapid advancement of the science in the United States is responsible in a very large measure for the rapidly growing interest in Canada. Although the broadcasting stations in Canada are modern in every respect and have interesting programs the number is limited. Consequently the operator, as is true the world over, experiments and is not satisfied until he has connected with a distant station in the United States. Only on rare occasions is it possible to tune in on Toronto from Ottawa. This is due chiefly to atmospheric conditions.

## Coming Events

FEBRUARY 18-22—Radio Exposition, State Armory, Syracuse, N. Y.

MARCH 4—Broadcasting of President Coolidge's inaugural speech.

APRIL 22-26—Third District Radio Convention, Steel Pier, Atlantic City, N. J.

SEPTEMBER—Second Radio World's Fair, New York City.

## 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 .....

Are you a dealer? .....

If not, who is your dealer? .....

His Name .....

His Address .....

Chas. E. Hyson, 196 Paradise Row, St. John, N. B., Canada.

A. L. Benshoff, Elliott, Ia.

George Johnson, Wanamingo, Minn.

A. E. Schrieblor, 685 N. 2nd St., Memphis, Tenn.

R. L. Boshor, Riverdale, Md.

Forest W. Harshberger, 251 North Bend, Burlington, Vt.

John E. Moore, 635 E. 2nd St., Plainfield, N. J.

C. L. Barker, 1149 E. 10th St., Indianapolis, Ind.

Frederick Calvert Co., Dexter, N. M. (dealer).

Henry Davenport, 3033 Budlong Ave., Los Angeles.

W. T. Slocum, Long Branch, N. J. (dealer).

W. O. Bradley, Box 268, Beattyville, Ky.

Harry W. Smith, Camp Marfa, 1st U. S. Calvary, Texas.

Lee Shearman, Jelaine, Ga.

Donald Stewart, Shelbyville, Ind.

Bernice G. Parkery Dickinson Ctr., N. Y.

Fred Miller, 403 Jackson St., Pittsburgh, Pa.

P. A. Keppel, 635 Walnut St., Cincinnati, O.

Joe Cuny, Franklin Tex.

R. G. Beatright, Coeburn, Va.

Robert E. Teale, 713 Washington St., Charleroi, Pa.

Hardine Gale, Pine Plains, N. Y.

Jack Rolfe, 30 N. 37th St., Phila., Pa.

Benedict Bruzek, New Prague, Minn.

James B. Berry, Market House, Meadville, Pa.

H. A. Mendell, St. Louis, Mo.

John R. McDougal, Florence P. O., Cape Briton, N. S. Canada.

Albert C. Barr, 1623 Kenneth Ave., Arnold, Pa.

Walter C. Schubert, Racine, Wis.

G. N. Hewitt, Jr., Glasgow, Mont.

A. R. Villareal, Laredo, Tex.

Eugene Saffell, New Lexington, O.

Karl A. Graef, 2652 N. 30th St., Phila., Pa.

Goncalves & Toledo, Rua Washington Luiz, 36, Sao Paulo, Brazil.

J. D. Twombly, 135 E. 122nd St., New York City.

N. E. Grubbs, Alabama Poly-Tech. Institute, Box 1395, Auburn, Ala.

H. E. Millay, Ellsworth, Ill.

I. Peterman, 250 Phila. Ave., Waynesboro, Pa.

I. Carlson, 852 Rogers Ave., Brooklyn, N. Y.

Joseph M. Mahony, 1023 Simpson St., Evanston, Ill.

H. W. Ritter, 1267 E. 112th St., Cleveland, O.

F. K. Weiser, Haskell, Okla.

E. W. Riepe, Metropolis, Ill.

Clarksburg Tire Co., Clarksburg, West Va. (dealer).

## Business Opportunities Radio and Electrical

Rates: 50c a line; Minimum, \$1.00

EXCLUSIVE TERRITORY for fast selling radio appliance; applicants must have minimum of \$1,500 as evidence of good faith; this is an opportunity to make real money for an ambitious getter. Box A, Radio World.

### IMMEDIATE LOANS ON CARS

While used or in storage. Confidential.  
CIRCLE AUTO FINANCE CO.,  
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### INVENTORS' MODELS

Small and large machines and labor-saving tools constructed and repaired radio parts made to order; shop set to let with use of machinery. Machine Shop, 5 Mulberry St., at Chatham Square, N. Y. C. Phone Worth 4179.

RADIO BULB FACTORY, equipped with modern machinery, for sale. Box B, Radio World.

RADIO MANUFACTURER wants new items; inventions having merit will receive consideration; have manufacturing facilities and good selling organization. Box C, Radio World.

BROOKLYN, N. Y., radio store for sale; must sell on account of other business; subway location; \$1,000 cash. Box D, Radio World.

CAPITAL WITH OR WITHOUT SERVICES; can place units \$5,000 to \$100,000 in profitable established businesses. H. M. Black & Co., 29 years' banking experience. 55 B'way, N. Y.

**For Daylight Reception Use**  
**Hetro-Magnetic Receivers**  
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 will work 400 to 1,000 miles if made by my plans. No tubes or batteries. Copyrighted plans \$1.00; or furnished FREE with complete parts for building set, including special coil and panel correctly drilled for only \$5.00. Satisfaction guaranteed or money refunded. Satisfied customers everywhere. Particulars free.  
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**FILE-KO-LEAK**  
**SCIENTIFICALLY CORRECT**  
**VARIABLE; HAND CALIBRATED**  
**IN MEGOHMS**  
 Eliminates distortion; increases volume. Can be read through panel peep-hole and legged. Ask your dealer or write Dept. RW 110.  
**DX INSTRUMENT COMPANY**  
 HARRISBURG, PA.

**"Morsing Bus-Bar Union"**  
 Assemble Round or Square Bus Bar and Solder Three Wires at a Time.  Quick Assembling. Repairs Can Be Made Without Taking Set Apart.  
 Enough for one set, 25c  
 No. 1 for 14; No. 2 for 12 wire.  
 Ten dozen for \$1.00.  
 Newark Watch Case Material Co.  
 15 Ward Street Newark, N. J.  
**DISTRIBUTORS WANTED**

**NEW REFLEX TUBES**  
**\$2.50**  
 CANADA 35c EXTRA  
 All Tubes Guaranteed.  
 Mail Orders Solicited.  
 Dealers and Jobbers  
 Write for Discounts.  
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 455 SPRINGFIELD AVE.  
 NEWARK, N. J.

**For Crystal Set Owners**  
 Illustrated articles on the making and use of crystal sets appeared in Radio World dated Dec. 6, 20 and 27, 1924, and Jan. 24, 1925. 15c per copy, or the 4 copies for 60c.  
**RADIO WORLD, 1493 Broadway, New York**

**EARLY LEANINGS**  
  
**BABY** thinks the bottle is a tube and tries to put it in a socket, but it won't oscillate, because he inserted the bulb tip first!

**New Corporations**  
 Sound Wave Corp., Brooklyn, N. Y., \$10,000; A. A. Falk, A. Levin, C. T. Brinn. (Attys. Kaye, McDavitt & Scholer, 149 Broadway, New York City).  
 World Radio Manufacturing Co., New York City; \$1,000,000. (Registrar & Transfer Co.)  
 Trans-Atlantic Radio Products Corp., New York City; \$1,000,000. (United States Corp. Co.)  
 Moon Record Co., New York City; \$300,000. E. W. Jones, M. M. Nassau, J. J. Hanrahan. (Attys. F. J. Knorr, Albany, N. Y.)  
 Supertron Mfg. Co., New York City; \$10,000,000. J. S. Fay, C. F. Leppard. (Atty. C. J. Holland, 350 Madison Ave., New York City)  
 David Grimes Radio and Cameo Record Corp., Wilmington, Del. To operate stations; \$30,000,000. (Corp. Trust Co. of America).  
 Chippewa Radio Corp., Buffalo, N. Y. 100 shares preferred, \$100 each; 200 common, no par. A. E. & C. G. Terry, W. G. Schoelkopf. (Attys. Jacobson & McCormick, Buffalo).  
 Vary & Co., New York City, built sets; \$5,300. G. J. & J. A. Christmann, P. Vary. (Atty. C. O. Johnson, 185 Montague St., Brooklyn.)  
 Caldwell Radio Horn Corp., New York City. Same as preceding.

**Toroidal RF Transformers**  
**THE Summit Radio Mfg. Co.**, of 481 Broad St., Newark, N. J., is marketing a radio-frequency transformer that actually steps up the high frequency currents so that weak stations that were in the aerial circuit but lost before they reached the tube are detected and, with audio stages, operate a loudspeaker.  
 The Summit Co. reports it finds the Toroidal winding superior to any other coil, so used this winding. The transformers are very well made and operate efficiently.

**SEND A THANK-U-GRAM**  
  
 To the stations and artists who are broadcasting for your entertainment. Thank-U-grams make it easy for you. **YOU NAME AND ADDRESS PRINTED ON EACH CARD FREE.**  
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**Free Mailing Lists**  
 Will help you increase sales. Send for FREE catalog giving names and addresses of classified groups of your best prospective customers: National, State, Local, Individual, Professional, Business Firms.  
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**A SIMPLIFIED NEUTRODYNE**  
 The standard Neutrodyne, with grid-biased detector, described by J. E. Anderson in the September 6 issue. Send 15 cents for a copy to **RADIO WORLD, 1493 Broadway, N. Y. C.**

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 55 Vesey Street Dept. A-154 New York

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**A 5-Tube, Tuned Radio Frequency Receiver that represents the greatest value ever offered in a \$60 radio set**  
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**Journal Filter Tuner Kitset**  
 Build this wonderful receiver that has won Gold Medals and the admiration of countless radio enthusiasts. It separates local stations with ease; tunes with the sharpness of a multi-tube set, and filters out undesired signals so satisfactorily that DX stations can be heard while local stations are broadcasting. It has selectivity, distance, and plenty of volume. One or two stages of audio amplification can be added to this set at any time. Complete parts for building this 1-tube set, including cabinet, drilled and engraved panel and wiring diagram for—  
**\$10.00 complete parts**  
 Approximate Weight (packed) 10 lbs. (Tube and Batteries extra)  
 Parts Fully Guaranteed  
 Shipped anywhere. Money Order must accompany each order—no personal checks accepted. Sufficient postage must be included in order. Send for our Radio Bargain List.  
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**NOW \$3.00**  
 Approved by Radio News Laboratories  
**TYPES**  
 400—4 V. 1/4 Amp.—Det.  
 401A—4 V. 1/4 Amp.—Det. and Amp.  
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 409—3 V. .06 Amp.—Det. and Amp.  
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"A SELECTIVE 2-TUBE SUPERDYNE," by Herman Bernard, November 29 issue. Two RF and crystal detector, for fine quality and about 500 miles' reception. Send 15 cents for copy. **RADIO WORLD, 1493 Broadway, New York City.**

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We have helped hundreds to success with RADIO WORLD hookups, especially SUPERDYNE—LET US HELP YOU. We are ready with kits and complete parts for BERNARD'S new 4-Tube SUPERDYNE, the premier circuit of 1925. All parts of highest quality—see our guarantee in past issues of RADIO WORLD.

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## THE PRESSLEY SUPERHETERODYNE

The U. S. Army Airplane Set

COMPLETE SET OF SANGAMO RADIO FREQUENCY TRANSFORMERS

**\$22.50**

COMPLETE PARTS AS FOLLOWS:

- 1 "Sangamo" oscillator coil unit
- 2 "Sangamo" type AT-60 intermediate-frequency transformers (air core)
- 2 "Sangamo" type IF-60, intermediate-frequency transformers (iron core)
- 1 "Cardwell" condenser, No. 123-BVL
- 1 "Cardwell" condenser, No. 123-BVR
- 1 "Cardwell" condenser, No. 155-B
- 2 3" dials for condensers
- 2 "Dubilier" mica fixed condensers .00015 mfd. with clips for grid leak
- 1 "Dubilier" mica fixed condenser .005 mfd.
- 1 "Dubilier" by-pass condenser .5 mfd.
- 1 1/2 megohm grid leak
- 2 "General Radio" 10 ohm type 801, rheostats

- 2 Audio-frequency transformers
- 1 "Benjamin" seven socket shelf, No. 8627 (complete with seven sockets and 11 binding posts)
- 1 "Benjamin" battery switch, No. 8640
- 1 pair of "Benjamin" shelf brackets
- 1 "Benjamin" bakelite panel for grid condenser, No. 8632
- 1 "Saturn" single-circuit jack
- 1 "Saturn" double-circuit jack
- 1 "Cartier" jack switch No. 8
- 1 Panel, 7 x 18 inches—drilled and engraved
- 1 Panel, Jewett Parkway
- 1 Loop

**\$85.00**

## Complete parts for BERNARD'S 4-TUBE SUPERDYNE

As Specified and checked over by Herman Bernard

- |   |                                       |
|---|---------------------------------------|
| One Superdyne Coupler                           | One Bradleystat                       |
| One Matched Radio-Frequency Transformer         | One Bradley Push-Pull Battery Switch  |
| One Bruno Ultra Vario Condenser No. 19          | One 7x24" Black Radion Panel          |
| Two 4" Black Accuratune Dials                   | One Tri-Jack (Or single-circuit jack) |
| One Federal No. 65 Audio-Frequency Transformer  | Two Silver Eureka Dial Pointers       |
| One Federal No. 65A Audio-Frequency Transformer | Two Lengths of Spaghetti              |
| Four Federal Sockets                            | One Eby Terminal Block                |
| One .00025 Mfd. Dubilier Grid Condenser         | Wire, etc.                            |
| One Variable Bradleyleak                        |                                       |

**\$42.50**

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NEW YORK CITY

SUPERDYNE ADVICE FREE

IF NOT LISTED ABOVE, WRITE FOR IT.

RESULTS GUARANTEED

MAIL ORDERS SOLICITED

## Programs

(Concluded from page 19)

Music Club, 5, children's program. 7:15, market, weather and news, police reports.

### Friday, January 30

- WHO, Des Moines, Ia., 522 (C. S. T.)—7:30 P. M., classical program. 8:30, the Williamson Bros., mandolin, guitar and banjo artists.
- WGBS, New York City, 316 (E. S. T.)—6:30 P. M., Abner J. Gelula, Technical Editor, Radio World, weekly talk on "Radio Bookings and Advice."
- WEEL, Boston, 303 (E. S. T.)—2 P. M., Happy Hawkins and his orch. 6:30, Big Brother Club, 7, musicale, 8, program announced, 9, musicale.
- WEMO, Barrien Springs, Mich., 286 (C. S. T.)—9 P. M., Radio Lighthouse Choir. 9:15, Life of Isaac Watts, singing a few of his well-known

hymns. 9:30, Ruth Lee, soprano. 9:45, Mary Lamson, reader. 10:05, Ralph Wade and E. DeLong, saxophonists.

WWJ, Detroit, 517 (E. S. T.)—8 A. M., setting-up exercises. 9:30, "Tonight's dinner" and a special talk. 9:45, bulletin. 10:25, weather. 11:55, time. 3 P. M., News. 3:50, weather. 3:55, market reports. 8:30, News orch.; Anne Campbell, poet; Norman Butterfield, baritone.

KGO, Oakland, Cal., 312 (P. S. T.)—11:30 A. M., luncheon concert. 1:30 P. M., N. Y. and S. F. stock reports, weather. 3, musical program, speaker. 4, concert orch. 5:30, the girls' half hour. 6:45, stock reports, weather, S. F. produce news, and news.

WOO, Philadelphia, 510 (E. S. T.)—11 A. M., organ. 11:30, weather. 11:55, time. 12, Tea Room orch. 4:40 P. M., police reports. 4:45, grand organ and trumpets. 7:30, police reports; A. Candelori and his orch. 8:30, special program from studio. 9:25, musical program—James MacDonald, tenor; Douglass MacDonald, baritone; Harriette G. Ridley, accompanist. 9:55, time. 10:02, weather. 10:03, Hotel Adelphia orch. 10:30, Vincent Rizzo and orch.

WBZ, Springfield, Mass., 337 (E. S. T.)—11:55 A. M., time, weather, Springfield market. 7 P. M., market report. 7:05, bedtime story. 7:15, sketches from history. 7:30, concert by the Hotel Kimball trio. 8, broadcast from Boston Arena. 9:55, time, weather.

KWG, Portland, Ore., 492 (P. S. T.)—11:30 A. M., weather. 12:30 P. M., concert, 5, children's program. 7:15, market, weather and news, police reports. 8, lecture. 10:30, Hoot Owls.

### Saturday, January 31

WWJ, Detroit, 517 (E. S. T.)—8 A. M., setting-up exercises. 9:30, "Tonight's Dinner" and a special talk. 9:45, public health service bulletin.

10:25, weather. 11:55, time. 3 P. M., News orch. 3:50, weather. 3:55, markets.

WHAS, Louisville, Ky., 480 (C. S. T.)—4 P. M., Alamo Theater organ, police bulletins, weather, "Just Among Home Folks," readings, news. 4:55, market reports. 5, time. 7:30, Barney Rapp's orch. Wendell Hall, news, time.

KGO, Oakland, Cal., 312 (P. S. T.)—11:30 A. M., luncheon concert. 12:30, stock and weather. 4 P. M., concert orch. 8, San Francisco Musical Club; "The Proposed Changes in the Direct Primary Law" by J. H. Zemansky; Arrillaga Musical College. 10, Henry Halstead's orch.

KGW, Portland, Ore., 492 (P. S. T.)—11:30 A. M., weather. 10 P. M., Geo. Olson's Metropolitan orch.

## Radio Cross-Word Puzzle

THE following is the solution of the Radio Cross-Word Puzzle published January 10. The names of those who sent in the correct solution will be published.

Horizontal—1, Radio; 5, bulbs; 10, Arid; 11, E; 12, salt; 13, tin; 14, set; 16, bee; 17, IA; 18, PO; 19, IT; 21, WP; 22, WOC; 24, desk; 25, kits; 26, C; 27, ate; 29, LT; 31, ST; 32, RL; 33, FO; 34, IRT; 36, SOS; 38, art; 39, peal; 41, WREO; 42, sends; 43, tuner.

Vertical—1, ratio; 2, Aria; 3, din; 4, ID; 6, us; 7, LAB; 8, blew; 9, steps; 11, EE; 14, sockets; 18, posts; 20, trial; 22, WA; 23, ATR; 26, clips; 28, rotor; 30, tree; 33, free; 35, tan; 37, on; 38, ARN; 40, LO; 41, WU.

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### Index Vol. 5 of Radio World

From January 1, 1924, to September 1, 1924.

Full contents, errors indexed, appeared in Radio World dated Oct. 15. 15c. per copy

or start your subscription with that number.

Radio World, 1493 Broadway, N. Y. C.

# Radio Survey

(Concluded from page 20)

and were saving our money to buy a car when we decided to purchase a radio. Now we have our longed for church services every Sunday and some form of entertainment every night all in the comfort of our own living room."

**Aurel R. Beets, Gibbs, Mo.**—"We were buying corn and feeding 104 hogs this

**TEN TIMES TESTED TOWERS**  
Scientific Phones  
\$2.95

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All Steel Construction

Painted black complete with galvanized steel guy wires and masthead pulley. 20' mast \$10. 40' mast \$25. 60' mast \$45. We pay freight. Ideal for receiving or transmitting. Greater range. More satisfactory results. Write for literature and large

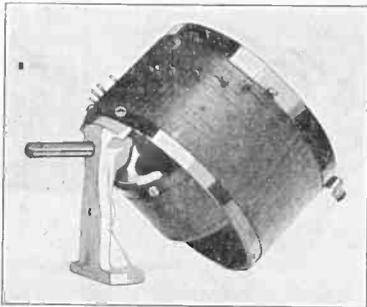
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180° UNDERCUT STATOR



THE TUNER THAT MADE THE DX SPECIAL SET FAMOUS ALMOST OVERNIGHT

THIS SPECIAL TUNER ENABLED THE manufacturers of the DX Special Set to guarantee two thousand miles on their sets.

SENT POSTPAID ON RECEIPT OF \$2.00

## TRI-DOT

ELECTRIC CO., INC.  
16 HUDSON ST., NEW YORK CITY

past summer and the market reports we received I know saved us our entire cost of the radio. The weather reports are of great value also the cold snaps last winter that caught our hen houses with windows open won't do it this year as we have our radio now. Our hens were laying over 100 eggs a day then and after their combs were frozen they dropped off to 2 a day or less. We lost the price of a radio set there."

**G. C. Rawlings, Rogers Gap, Ky.**—"The radio has solved the problem of keeping the boys and girls at home at night, also it will not be necessary to wait for a newspaper to get the market news. No farm is complete without a radio set."

**Miss Myra A. Phemstead, Brockton, Mass.**—"How quickly radio changed for the farmers hours of monotony to hours of delight. To them a door was opened and the magic from a world of education and delight entered. This is but one farm that has been drawn out of a rut through the medium of radio and placed squarely on the road to progress."

**Mrs. G. W. Fitch, Yankton, S. D.**—"Few people realize how lonely it is in winter on the wind swept prairies far from town and neighbors. We live on a ranch 20 miles from town and 2 miles from a neighbor. I have often felt that if we lost everything by moving, I could not stay here another winter. But since installing a radio set the loneliness is gone and we seem to be living in the center of the world. We are no longer isolated but can feel the throbbing life of the world beating at our very doors."

**Guy T. Bennett, Caldwell, Idaho.**—"One cold night I was listening in to a weather report and the man said that a cyclone might come and it would be a hard storm so I got to thinking and called my hired man and went out and stuck the stock in the barn. A blizzard came up during the night and snow piled up in my yard where stock would have been about 25 feet. It saved me about \$500 in cows alone. At one time I was about ready to ship 2 car loads of cattle when I heard a market report from the very place where I expected to ship. The man said do not ship your stock as prices are going down fast. I did not ship until the next week when prices were up again and I doubled my money."

**C. E. Nelson, Marietta, Wis.**—"If a farmer owning a radio has wheat to sell and the market for wheat drops in price and if he is listening in he can step to his telephone, can up his elevator and sell before the price has dropped at his local elevator. The advance information received by the farmer may be valuable enough to purchase several radio sets. Weather reports will keep him informed as to whether he should go to the country farm today or stay at home and cover up his garden truck and keep them from freezing."

**H. Edward Knies, White Haven, Pa.**—"Farmers enjoy the radio because it puts him in close and instant touch with much of the great outside world from which he is naturally cut off to a certain extent. It helps guide him in his harvesting enabling him to take advantage of every

prospective weather change whether favorable or unfavorable and to be governed accordingly in harvesting, seed sowing and other farm work."

**C. Robinson, Spartanburg, S. C.**—"Radio enables one to receive the latest market quotations much quicker than any other machine. It is of vital interest to the farmer for he can by taking advantage of the information thus received dispose of his products at the best price."

(Copyright, 1925)

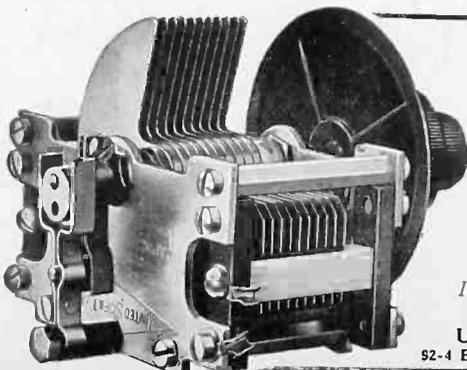
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ON COST OF NEW TUBES BY HAVING YOUR OLD TUBES REBUILT AT \$1.75 EACH.  
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**KOIL KIT COMPLETE \$7.00**  
1-3 Circuit Superdyne Coupler  
1-Superdyne R.F. Transformer  
Both Units are All-Lists Wound on Bakelite Base  
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# New Radio Typewriter Promises Quiet Commercial Revolution

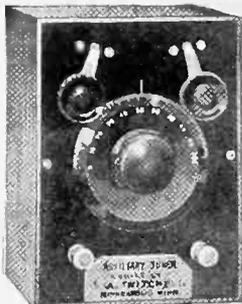
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Better Than a Wave Trap

Improved Model

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connected to your instrument will positively eliminate all local interference and enable you to bring in distant stations at any time. They are in successful use within 400 feet of large broadcasting stations. They also enable you to receive on longer wave length than you can get without it.

Copyrighted diagram ..... \$ .50  
All parts including cabinet ..... 9.00  
Complete Tuner, Walnut cabinet ..... 15.00

All Goods Prepaid

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This remarkable invention is to all outward appearances an ordinary typewriter with a sort of cash register attachment, known as the combiner.

Whenever one of the keys on the typewriter is struck, it sends a current through the combiner, which selects a Morse code letter in accordance with the combination used, and which operates only one receiving instrument. The receiving instrument is apparently another ordinary typewriter, and it writes along as the combined alphabet comes in, in clear English, or French, or whatever language was originally used.

Transmission is as instantaneous as a sound in a radio receiver, and a business man can have a letter typed out to his correspondent at the other end of the earth, while the latter can read the letter as fast as it is written from the main office.

A merchant could order his goods from the plantation or the mine, a second after making a deal in the city, and the stock broker could play the New York market from Hawaii or Nice with the same facility that he would have in his Wall Street office.

Newspapers can get stories from their reporters as fast as they are written and while the actual events described are go-

ing on. There is no end to the amazing possibilities of this method of recording long distance radio communications. The receiving apparatus will probably take

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A Marvelous New Antenna, the Popularity of Which is Fairly Sweeping the Country.

Spider-web wound with silk over phosphor-bronze wire on genuine Bakelite frame, the PARAMOUNT LOOP gathers and sends direct to the receiver every electron of current, producing

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Order a PARAMOUNT LOOP from Your Dealer—or Direct from the Manufacturer—To-day!

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## 3-Tube Neutrodyne

Fully described in September 13 issue of RADIO WORLD.

Two stages of RF, tube detector and two stages of AF, all on three tubes! A successful reflex. Volume, DX and quality signals. Send 15 cents for a copy, or start subscription with that number.

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



Herman Bernard

Herman Bernard

## The Bruno Ultra-Vario Condenser

Cat. No. 19, is certified by me as the only one used in building RADIO WORLD'S 1925 4-Tube DX Superdyne.

(Signed)

# "Bruno"



## Ultra-Vario Condensers

Cat.-No. 19, \$7.50

A multiple tuning condenser of rigid mechanical construction and high electrical efficiency.

If your dealer can't supply you, write direct

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SUPER-HETERODYNE

Our COCKADAY Super-Heterodyne Kit is approved by RADIO WORLD and POPULAR RADIO Laboratories. The parts are exactly as specified by Lawrence M. Cockaday.

COMPLETE PARTS EXACTLY AS SPECIFIED BY MR. COCKADAY

1—General Instrument .0005 mfd. NO LOSS with Isolantite Insulation. 1—General Instrument .001 mfd. NO LOSS with Isolantite Insulation. 1—Haynes Griffin Input Transformer (new type). 3—Haynes Griffin Intermediate Transformers (new type). 1—Precision Autodyne Coupler. 1—Karas Harmonik Audio Frequency Transformer. 1—Amplex Grid-denser. 1—Benjamin Clearatone Socket. 7—Federal Sockets No. 16. 1—Patent Double Circuit Jack. 1—Patent Single Circuit Jack. 2—NAALD 4 Inch Dials. 1—Amsoe Rheostat 2 ohm. 1—Amsoe Potentiometer 400 ohm. 2—Daven Resisto Coupler Mounts. 1—Daven Grid Leak mounting. 2—Daven Resistors .5 megohm (500,000 ohm). 1—Daven Resistor .5 megohms. 1—Daven Resistor .005 megohms (5,000 ohm). 2—Daven Resistors .25 megohms (250,000 ohm). 2—New York Mica Condensers .0001 mfd. 4—New York Mica Condensers .0008 mfd. 1—New York Mica Condensers .00025 mfd. with grid leak mounts. 1—Duratran Radio Frequency Transformer. 1—Walbert "A" Battery Switch. 7—Eby Marked Binding Posts. 1—7x24 Drilled and ENGRAVED BAKELITE PANEL. 1—Baseboard. 1—Drilled Binding Post Panel. 1—Box of Assorted Screws, Nuts, Washers, lugs, etc. 40—Ft. of Tinned Bus Wire. 1—Set of Angle Brackets for Mounting Post Panel. 1—Set of three Popular Radio blueprints covering complete constructional details for building this Receiver.

Regular Price of this Kit \$82.50

Our Price for Complete Kit **\$65.00**

Complete best-quality parts, as used in RADIO WORLD Laboratories by

HERMAN BERNARD  
RADIO WORLD'S  
4-TUBE SUPERDYNE

1—Globe Low Loss Superdyne Coll. 1—Matched Radio Frequency Transformer. 1—Bruno Ultra Varlo Condenser No. 19. 2—Accuratune Dials 80-1 ratio. 1—Federal Audio Frequency Transformer, No. 65. 1—Federal Audio Frequency Transformer, No. 65A. 4—Federal Sockets. 1—Dubbler .00025 Mfd. Grid Condenser. 1—Bradley-leak New Type. 1—Bradleystat New Type. 1—Bradley Push Pull Battery Switch. 1—Tri-Jack New Type. 1—7x24 Drilled and Engraved Panel. 1—Baseboard. 30—Feet of Bus Wire. 1—Eby Terminal Block with Posts. 1—Box of Assorted Screws. Complete Set of Blue Prints and Instructions.

OUR COMPLETE KIT PRICE **\$43.50**

Positively no Substitutes.

Wholesale Radio Service Co.  
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# Girl's Lost Identity Restored by Her Broadcast Appeal

**Aunt in St. Louis, Hunting DX, Suddenly Tunes in Familiar Voice of Amnesia Victim Making Plea for Identification Before Chicago Microphone—Girl's Mother, Desperately Ill, Not Told Daughter Was Missing.**

CHICAGO.

HER own appeal to the world by radio brought knowledge of her name and home to Charlotte "Norris," the mystery girl in the County Hospital, who had been unable to remember anything about her-

self since she was found in a faint two months ago in the Union Station here.

She was identified as Charlotte McGuire, 20 years old, of St. Louis, by Mrs. George Griffiths, an aunt, and Miss Genevieve Sullivan, a cousin. She departed with them for St. Louis at once.

When they entered the hospital this morning the girl, who had appealed for aid in learning her name through radio station WEBB of the Edgewater Beach Hotel and Chicago Evening Post, looked at them blankly for a moment.

"Aunt! Cousin!" she cried, and embraced them.

### Where Memory Failed

The visitors told Michael Zimmer, warden of the hospital, that the girl disappeared from St. Louis Nov. 19, after



## FEDERAL TUBES —THEY SATISFY

Just the Tube to give the Radio Set Owner the Joy of Perfect Reception  
EVERY FEDERAL TUBE A TALKER  
EVERY USER A BOOSTER

Clear Tone and Better Reception Assured!  
Excellent for Bringing in Distant Stations!  
Federal tubes are made by men who are expert in tube construction. Try them and end your tube troubles.

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10 CENTS A WORD. 10 WORDS MINIMUM

FOR SALE—Workrite Neutrodyne kit, \$12.00. Write for information. Lawrence Higgins, West Buxton, Maine.

BUILD YOUR OWN—Best low loss parts, units, full size diagrams. Reflex and three circuit at 15% saving. Write, Reflex Radio, Dunellen, N. J.

FOR SALE—7A Western Electric Amplifier with tubes and horn, cheap. Cauthen Bros., Orangeburg, S. C.

DON'T THROW AWAY run-down "B" batteries. In most cases they can be repaired or renewed for additional service. Ex-Navy radioman will send complete instructions for 25c. L. Gassmann, Olney, Ill.

HOW to build a simple current supply unit, by Brainard Foote. You can light your amplifier tubes at a cost of only a few cents a year. Complete construction article and diagrams, with photo of completed unit, in Radio World, issue of Aug. 16. Send 15 cents for a copy or start your subscription with that number. RADIO WORLD.

AGENTS—Write for free samples. Sell Madison "Better-Made" Shirts for large Manufacturer direct to wearer. No capital or experience required. Many earn \$100 weekly and bonus. MADISON MILLS, 564 Broadway, New York.

DINING & SLEEPING CAR CONDUCTORS (white), Exp. unnecessary. We train you. Send for book of Rules and application. Supt. Railway Exchange, Sta. C, Los Angeles.

LOW-LOSS INDUCTANCE FORMS—Linen Impregnated Bakelite, 50c each. The Kehler Radio Laboratories, Abilene, Kansas.

COMPLETE 1924 INDEX OF RADIO WORLD, appeared in RADIO WORLD dated Oct. 18, 1924, and Jan. 10, 1925. 15c per copy. RADIO WORLD, 1493 B'way, N. Y.

COMMERCIAL TYPE RADIO APPARATUS, by M. B. Sleeper. Mailed on receipt of 75c. The Columbia Print, 1493 Broadway, N. Y. C.

RADIO WORLD'S CLASSIFIED DEPARTMENT. If you want to buy, sell or exchange anything, use RADIO WORLD'S Quick-Action Classified Department, 10 cents per word, 10 words minimum. RADIO WORLD, 1493 Broadway, N. Y.

"A 6-TUBE SUPER-HETERODYNE," by J. E. Anderson. Variometer tunes aerial. How to make all coils, including intermediate frequency transformers. Send 15 cents for December 6 issue to RADIO WORLD, 1493 Broadway, New York City, or start your subscription with that number.

SELL—CHEAP—Honeycomb coil set. Write, Maxwell Murphy, Eastport, Maine.

"THE 1-TUBE REFLEXED SUPERDYNE," by Herman Bernard. One stage of tuned regenerative RF, crystal detector and one audio stage. No tickler. This set is for those preferring quality to DX. Send 15 cents for December 6 issue. Those desiring a DX 1-tube Superdyne, send 15 cents for December 20 issue. RADIO WORLD, 1493 Broadway, New York City.

# A Radio True Story

(Concluded from preceding page)  
she had left the home of her parents to attend class at a teachers' college there. How she got here the patient was unable to explain.

"I remember leaving home to go to the university," Miss McGuire said after her relatives had told their story. "I was walking on one of the shaded paths leading to the campus. The next thing I remember is that I was in the hospital here."

She said she could recall nothing more. In desperation, the girl tearfully agreed to broadcast an appeal by radio to try to find her lost name, it being explained that relatives or friends who might have missed newspaper accounts and failed to recognize photographs would know her voice. Speaking in a low tone and with apparent emotion, the girl asked her unseen audience to assist her.

## Luck in Her DX Hunt

By her fireside in St. Louis, Mrs. Griffiths was trying to "tune in" on distant stations, when suddenly she heard the low voice of a girl who, before the Chicago microphone, said she believed her name to be "Charlotte" and explained she was broadcasting an appeal to relatives and friends in an effort to ascertain her identity. Then the voice trailed off and an announcer said that the young woman was unable to continue her appeal.

Startled by the voice which she believed she recognized, Mrs. Griffiths next morning read newspaper accounts of the broadcasting of the mystery girl's message, then called the Chicago hospital where the girl was a patient. The young

woman, however, apparently failed to recognize her aunt's voice over the telephone and the conversation seemed to restore none of the things her mind had forgotten.

## The Bird on Auntie's Hat

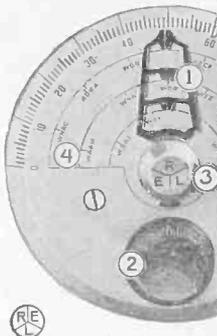
Mrs. Griffiths and Miss Sullivan arrived from St. Louis and went at once to the hospital. They approached the patient from behind a screen about her bed. The girl could not see her visitors, but above the screen a bird decoration on Mrs. Griffiths' hat jiggled saucily. The girl suddenly saw the bird, then clapped her hands and with sparkling eyes turned to a nurse.

"That bird?" she said. "I know it. It's on Aunt Annie's hat."

A moment later her aunt and cousin appeared before her. She gazed at them a moment, then gave a cry of "Auntie! Cousin!"

Mrs. Griffiths said that the girl's parents, Mr. and Mrs. Francis McGuire, of 5,545 Wells street, St. Louis, believed that their daughter was visiting relatives in Kirkwood, Mo., and had not been informed of her disappearance because of the serious illness of Mrs. McGuire.

## Direct Tuning!



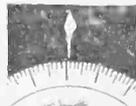
Pencil record a station on the dial—thereafter simply turn the finder to your pencil-mark to get that station instantly. Eliminates fumbling. 1. This alignment is the gauge for penciled station records. 2. Operates vernier for hair-splitting adjustment. 3. Takes standard condenser shaft lengths—easy to mount. 4. Penciled station records easily erased from silver dial. Designed by R. E. LaCault, inventor of the famous Ultradyne circuit. This monogram seal (R.E.L.) is your assurance of LaCault's design. Retail at \$2.50

**ULTRA-VERDIER**  
TUNING CONTROL  
PHENIX RADIO CORPORATION  
9 Beckman Street New York City

## Radio EUREKA Radio DIAL POINTER

Beautifully your set by installing the Eureka Dial Pointers. You save eyestrain and eliminate guesswork in logging your stations.

10c each  
Screws  
fast to  
Panel



Gilt or  
Nickel  
finish

Obtain at your dealer's or send 10c in stamps for each sample desired.

Manufactured by C. W. BUTTS, Inc.  
42 Hedden Place East Orange, N. J.  
Responsible jobber wanted in each city.

## 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

**FREE** To Each Purchaser of a **World Battery**

A 24-Volt "B" Storage Battery positively given FREE with each purchase of a WORLD "A" Storage Battery. The WORLD Battery is famous for its guaranteed quality and service. Backed by years of Successful Manufacture and Thousands of Satisfied Users. You save 50%.

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Auto Batteries	Radio Batteries
6-Volt, 11 Plate \$12.25	6-Volt, 100 Amps. 12.50
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Shipment Express C. O. D. subject to examination.  
5 per cent discount for cash in full with order.

### 2-Yr. Guarantee Bond in Writing With Each World Storage Battery

proves satisfactory World performance. Mail this ad with your name and address—we will ship battery (day order is received) and give you your choice of "B" Storage Battery or a handsome nickel finish Auto Spotlite, FREE. Write TODAY.

### WORLD BATTERY COMPANY

1219 So. Wabash Ave. Dept. 17 CHICAGO, ILL.  
This FREE "B" Storage Battery takes the place of dry cell batteries. Can be recharged and will last indefinitely. To be sold retail for \$5.00. It is the only battery of its kind equipped with solid rubber case—and insurance against acid and leakage. Take advantage of this remarkable introductory offer NOW. (To those who prefer it, we will send FREE a handsome nickel finish Auto Spotlite, instead of the "B" battery. Be sure to specify which is wanted.)

**GIVEN FREE**

To introduce this new and superior World "B" Storage Battery to the Public



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15870 Radio Dealers	Per M	\$7.50
970 Radio Dealers in Mexico	Per List	10.00
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2324 Radio Jobbers	Per List	20.00
1125 Radio Jobbers, rated \$5,000 and up	Per List	15.00
714 Radio Jobbers, rated \$50,000 and up	Per List	10.00
597 Radio Mfrs. making complete sets		5.00
128 Radio Battery Mfrs.		2.50
128 Radio Cabinet Mfrs.		2.50
60 Crystal Mounters for Wireless apparatus		2.50
25000 Radio Amateurs	Per M	7.50
325 Phonograph and Music Radio Dealers		5.00
7400 Radio owners	Per M	7.50

Guaranteed 98% correct. Ask for Price List and all other lists.

A. F. Williams, Mgr., List Dept.

Established 1880  
166 W. Adams St. Chicago, Ill.

## The Superdyne Cycle

"RADIO WORLD'S 1925 MODEL DX SUPERDYNE," by Herman Bernard. Only two controls; 4 tubes. Issues of January 10, 17 and 24.

"A 1-TUBE REFLEXED SUPERDYNE," by Herman Bernard. One stage of tuned regenerative RF, crystal detector and one AF stage, great quality of signals. Good for about 150 miles on earphones. Issue of December 6.

"A SELECTIVE 2-TUBE SUPERDYNE," by Herman Bernard. Fine quality. Good for about 500 miles on earphones. Two RF stages ahead of crystal detector. Very selective. Issue of November 29.

"THE 1-TUBE DX SUPERDYNE," by Herman Bernard. One of the best 1-tube DX sets ever published. Fine signal quality. Issue of December 20.

"THE 3-TUBE DX SUPERDYNE," by Herman Bernard, explaining how to add two audio stages, transformer-coupled, to the 1-Tube DX Superdyne. Issue of December 27. Get December 20 issue, too, for full particulars on the detector circuit.

"THE ANDERSON 4-TUBE DX SUPERDYNE," by J. E. Anderson, consulting engineer. One of the most popular and best DX and quality sets ever designed. Issues of November 22 and 29. TROUBLE-SHOOTING in December 6 issue.

Any of the above copies at 15 cents each, or start your subscription with any number. RADIO WORLD, 1493 Broadway, New York City.

"THE INSIDE STORY OF THE TUBE," by Abner J. Gelula. What happens on a tube. What tubes to use for different circuits. Send 15 cents for copy of November 29 issue to RADIO WORLD.

## ONLY THREE TUBES

and it is the equal of any five-tube set ever built. It has selectivity and volume equal to any Super-heterodyne or Neutrodyne.

It has the purity and quality of tone of the crystal set.

It has the simplicity of control of the single-circuit set.

It is brought in Honolulu, Paris, London and other foreign stations on a loud speaker.

It gets distant stations while a 500-watt station only three blocks away is broadcasting.

It has only two controls and can be lagged.

It is not a reflex; it is the result of years of careful scientific research and experiment.

Any novice can build one successfully from our diagrams with complete instructions and special set.

PRICES  
Diagram, instructions and set..... \$5.00  
Three-tube instrument ready to use... \$8.00  
One-tube instrument ready to use;  
gets everything on head-phones... 16.50  
Build or buy one of these wonderfully sensitive instruments and you will want no other.  
All goods shipped prepaid.

S. A. TWITCHELL CO.  
1030 WESTERN AVE. MINNEAPOLIS, MINN.



Bracket mounting type.  
Complete, \$4.50.

**One Pull** on the Jones MULTI-PLUG instantly disconnects antenna, ground, A and B batteries from your set. One push reconnects. And it can't be plugged in wrong! Right foot, cable permits placing batteries out of way—in basement, closet or elsewhere. Makes your set portable. All leads plainly coded.

## Jones MULTI-PLUG

THE STANDARD SET CONNECTOR

Used by

Howard-Workrite-Zenith-Mu-Rad

Write for illustrated folder of  
Panel Mounting and Binding  
Post types.

HOWARD B. JONES

618 S. Canal St. Chicago

# Sales Tax of 2% a Sane Idea, Says Hoover

WASHINGTON. "THE radio industry can't live on an endless diet of jazz," Secretary Hoover said in an interview on the future of radio broadcasting. Improvement of programs he deems more important now than further regulation until it becomes possible to say

what form of regulation is needed. The British licensing system, to cite one regulatory suggestion, would never be tolerated in this country, the Secretary thinks. "This country would never stand for licensing or taxing radio listeners," Mr. Hoover said. "That idea only works when one company has a monopoly and all the revenue so derived goes into one pool, and we don't like monopoly."

"And then how are you going to keep the unlicensed folks from listening in? Are you going to have a police force snooping around for illicit aerials and searching people's homes?"

"People go into theaters and pay admission and that solves the problem right there for the stage or concert hall, but it is obvious that there is no such way of getting the radio audience to pay for what it gets. So you've got to approach that some other way—leaving out the license tax scheme."

"I've heard only one very reasonable suggestion. That is to fix a certain tax—say 2 per cent., for instance—on the sale of radio equipment. One company reports sales running over \$22,000,000 in 1923, and that will be a good deal higher for this year. You could provide enough that way to pay for daily programs of the best skill and talent."

"Radio is becoming more important in the life of the country every day. It is already one of the necessary adjuncts. Right now I think the most important thing is improvement of what is put on the air. It isn't so much a question of growth, because that takes care of itself, as long as the material put out is really worth while. That is the most vital thing of all."

**SAVE 20%** On Everything  
From List Price

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Mail Orders Promptly Filled; 10% deposit with each order.

**YOU PAY US ONLY AFTER DEDUCTING 20% OFF LIST PRICE.**

**ECONOMY RADIO SALES CO., P. O. Box 99, Station O, Dept. 10, New York, N. Y.**

## At Last! Toroidal Radio Frequency Transformer

The "doughnut" or toroid coil is simplicity itself and represents a new step in tuned radio frequency amplification. To the discriminating Radio Fan who demands the utmost of his receiver from the standpoint of distance, selectivity, sensitivity and volume, the **SUMMIT TOROIDAL TRANSFORMERS** will prove a revelation. They are designed in accordance with modern transformer engineering principles, adding greatly to the efficiency of any receiver.

The **SUMMIT TOROIDAL TRANSFORMERS** are used in exactly the same manner as the open radio frequency coils—they have a correct ratio and are self-neutralized and self-balanced. There are no stray fields, leakages, nor can they feed back, thus assuring the experimenter and radio set builder of correct operation without howling or squealing. The low distributed capacity and low loss assures the greatest distance and power possible.

Diagrams and complete instructions for the assembly of the Five-Tube Summit Receiver enclosed with each set of Transformers. The beginner in radio set building (if he follows these instructions) will experience no difficulty in producing a finished set that will do all and more than any other set of like size.

List Price (Set of Three) \$10.00  
Mated Units

TERRITORY OPEN TO JOBBERS AND DISTRIBUTORS

**SUMMIT RADIO MANUFACTURING CO., Inc.**  
481 BROAD STREET      Dept. 25      NEWARK, N. J.

## BELLTONE RADIO TUBES

TYPE 201-A \$1.75 TYPE 11-12 199 200

199 With Standard Base  
Life, Tone and Volume

With Money-Back Guarantee  
Mail Orders Promptly Filled

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Room 411, 324 West 42nd Street, New York City

"THE INSIDE STORY OF THE TUBE," by Abner J. Gelula. What happens on a tube. What tubes to use for different circuits. Send 15 cents for copy of November 29 issue to RADIO WORLD.

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- RADIO NEWS or —RADIO DEALER or
- POPULAR RADIO or —RADIO JOURNAL or
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This is the way to get two publications

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- Send \$6.00 today for RADIO WORLD
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- extending subscriptions one year.
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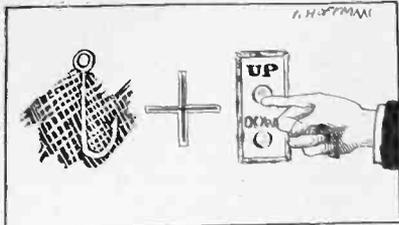
RADIO WORLD, 1493 Broadway, New York City  
Enclosed find \$6.00, for which send me RADIO WORLD for twelve months (52 numbers), beginning..... and also without additional cost, Radio News, or Popular Radio, or Radio Broadcast, or Wireless Age, or Radio Dealer, or Radio Journal, or two yearly subscriptions.

Indicate if renewal. Offer Good Until February 10, 1925

Name .....  
Street Address .....  
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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.

- Edwin Blalock, Montgomery, Ala.
- Ethelyn Reynolds, Crook, Col.
- Chas. Mathews, High Point, N. C.
- W. E. Harris, 502 E. Main St., Charlottesville, Va.
- Max H. Hopi, Harper, Tex.

### Radio Chess Match Barred in Britain

LONDON. THE Postmaster General has declined to give permission for a chess match between Oxford and Haverford University, in Pennsylvania, to be conducted by amateur wireless telegraphy. The idea was that the English end of the match should be in the house of an amateur

operator in Surrey, and the American end at Haverford University, but the Postmaster objected on the ground that permits are granted to amateurs subject to the condition that messages shall be sent only to stations which are actually cooperating in experiments, and that licenses relate solely to such experiments.

The exchange of messages relating to a chess match is not regarded by the Postmaster General as a bona fide experiment.

### This Set Will Set the Nut



The New Britain Machine Co.  
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DIALS, KNOBS, TUBING, SOCKETS  
 RADION LOUD SPEAKER HORNS, ETC.  
 "THAT SPECIAL SIZE" FOR YOUR  
 PHONOGRAPH, PORTABLE OR SUPER  
 ALL STOCK SIZES  
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## The "Goode" Two-o-One

# A

Le Ton d'argent

Guaranteed



BY MAIL ONLY  
**\$2.39**  
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### 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

(All Postage Prepaid)

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

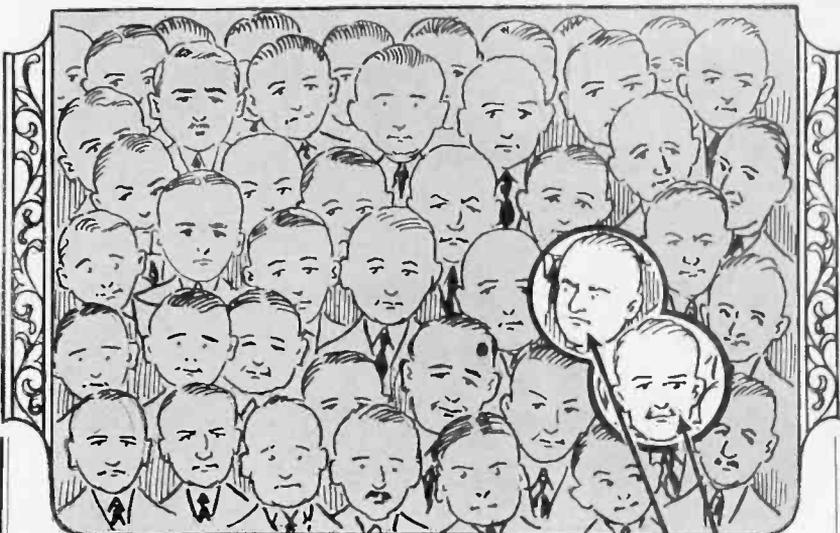
Send express or postal money order or New York draft to—

The Goode Tube Corporation  
 Incorporated Dept. B.  
 OWENSBORO KENTUCKY

### For Crystal Set Owners

Illustrated articles on the making and use of crystal sets appeared in Radio World dated Dec. 6, 20 and 27, 1924, and Jan. 24, 1925. 15c per copy or the 4 copies for 60c.

RADIO WORLD, 1497 Broadway, New York



### Mr. Manufacturer—

Would you write 100 letters to 100 people to reach just two men?

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City or Town.....  
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READING MICHIGAN

For Maximum Amplification Without  
Distortion and Tube Noises  
use the well known  
**Como Duplex Transformers**  
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"Popular Wherever Radio Is Used"  
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Dealers write for big money-  
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NEW TUBES  
ALL TYPES **\$2.15** EACH  
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Tested and approved by Radio World

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Build Your Own Set!  
Use Arc Rad Products.  
A Three-Circuit Coil, all  
Litz wound on natural  
bakelite.  
SENT  
PREPAID **\$3.00**  
Panel shield and hook-  
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stock clips used.  
Eliminates Soldering  
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48 South 7th Street Newark, N. J.  
EVERY PRODUCT GUARANTEED

**COMPLETE 1924 INDEX OF  
RADIO WORLD**

Appeared in RADIO WORLD dated Oct. 14, 1924,  
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**A** B. C. stands for the American Broad-  
cast Club. Join it today. It involves  
no dues or payment of any kind, and no  
obligations. It was founded by RADIO  
WORLD simply to unite the broadcast  
listeners and radio fans in general in a  
common bond to promote their welfare as  
occasion requires. Send your name and  
address to A. B. C. Editor, RADIO WORLD,  
1493 Broadway, New York City.

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- Geo. F. Steele, 214 Houston St., Ripon, Wis.
- James McKee, Box 395, Ridgewood, N. J.
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E. S., Mich.
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Mich.
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- A. R. Mitchell, 140 Bhue So., S. St. Paul, Minn.
- Fred J. Linz, 247 4th Ave., S. Minneapolis,  
Minn.
- Rodney Wirtz, Box 1862, Bisbee, Ariz.
- Wm. Sweaney, 921 5th St., N. E. Canton, O.
- Leopold Sauve, 1051 Cartier St., Montreal, Can.
- Henry F. Priebe, 1318 Harris St., Kent, O.

**Lopez Incorporates;  
Plans Greater  
Broadcasting**

**V**ICENT LOPEZ, WEAF broad-  
caster, has taken the jazz orchestra  
into the fields of finance. He announced  
that with a group of business men as  
directors and himself as President, Vin-  
cent Lopez, Inc., had been chartered to  
conduct musical enterprises of the kind he  
had made familiar and that some of the  
stock had been offered to the public. The  
stock would be listed and dealt in, he  
said, just as are the securities of any other  
incorporated company.

Mr. Lopez said recently at the  
Hotel Pennsylvania that his purpose was  
to apply big business methods to the jazz  
orchestras and other musical activities.  
"They say musicians are not business  
men. Well, we'll show them," he said.  
His scheme, as he outlined it, calls for  
the raising of capital so that more ac-  
tivities can be financed than he can take  
care of out of the profits of his present  
ventures. He has started to build up an  
organization that will be able to provide  
an orchestra for every important city in  
the United States. He also purposes to  
conduct a school of music that will train  
players for his chain of orchestras.  
Broadcasting on a large scale also is a  
part of the plan.

**S. HAMMER RADIO CO.**  
303 Atkins Avenue, Brooklyn, N. Y.  
Please send me FREE, Your NEW  
**RADIO CATALOG**

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

**EVEREADY**  
Radio Batteries  
-they last longer

**STERLING KNOCK DOWN  
"B" BATTERY CABINETS**  
FOR EDISON ELEMENTS  
All holes drilled. Assembled in five minutes.  
25 volts, \$0.65; 50 volts, \$0.80;  
100 volts, \$1.00, complete  
**NO DELAYS. MAIL SAME DAY.**  
**STERLING PATTERN WORKS**  
227 MILL STREET ROCHESTER, N. Y.



**LITTLE WONDER!**  
**SOLDERLESS LUG**  
Holds Bus Wire Like Clip!  
Connect or Disconnect Wires  
Without Disturbing Terminals!  
Price 10 for 5c. Ask your dealer.  
Distributors Wanted.  
Mfd. by PAUL GLAMZO  
283 Lafayette St. New York

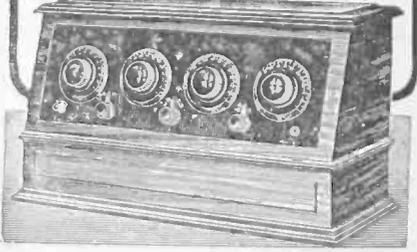
**3 Tubes Do the Work of 6**  
in this three-tube set that  
will pick up practically all  
the stations in U. S. on horn. **\$60**  
Dealers Wanted  
**RAY ISLER RADIO CO.**  
1021 Park Avenue Rochester, N. Y.

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-IN RADIO-**

**We Need Men—Can You Qualify?**

Ozarka representatives make real money be-  
cause they give real values and deliver a real  
service. For instance, there is a 4-tube Ozarka  
Instrument for loud speaker operation, giving  
wide range of reception at \$39.50. Our men  
demonstrate Ozarka Instruments and Install.  
The Instrument makes the sale easy by its per-  
formance. We train you to know radio and our methods,  
make you worthy to wear the Ozarka button as our  
accredited representative. Previous experience is not  
necessary. In fact we prefer to do our own educating.  
If you have a clean record, are industrious, and have  
saved up a little cash, here's a real opportunity, if  
you can qualify for an exclusive territory. We already  
have 224 representatives. Territory going fast.

**FREE, LARGE  
Illustrated BOOK**  
WRITE Today for illustrated  
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Ozarka Plan. Don't fail to give  
the name of your county.  
**OZARKA, Inc.**  
842 Washington Blvd.  
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**4 Tube Sets As Low \$39.50**  
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"HOW TO MAKE A \$1 COIL WINDER," by  
Herbert E. Layden. Send 15 cents for December  
6 issue. RADIO WORLD.

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**8 Weeks' Trial Subscription, \$1.00**

KEEP ABREAST OF THE LATEST  
RADIO DEVELOPMENTS  
**RADIO WORLD**  
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**WANTED**

Factory Distributors. Tremendous profits in distributing newly invented, much needed Radio devices. Patented. Sells for only 50 cents retail. Market several million yearly. Big repeats. Nationally advertised. Write at once for new sales plan.

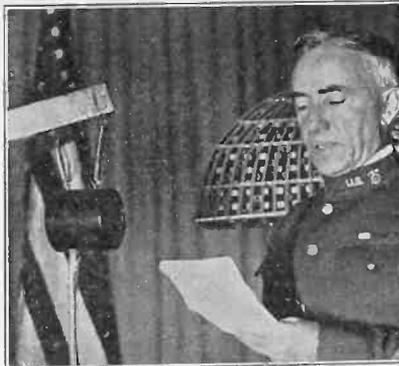
**RADIO EQUIPMENT COMPANY**  
20-W Stuart St. Boston, Mass.

**Best R. F. 5 Tube Hookup**

Uses same panel, same layout, same (but fewer) parts than Neutrodyne. Gives selectivity and pleasing volume from Coast to Coast. Hundreds have changed their Neutros to this. Only extra part, 22 feet real gold sheathed bus wire, lithographed circuit and complete data, prepaid, for \$5.00. Nothing else to buy. Satisfaction guaranteed. Data about circuit—10c. 48 page parts catalog for stamp. We accept stamps same as cash.

KLADAG RADIO LABORATORIES, Kent, Ohio

**General On Air**



MAJOR-GENERAL WILLIAM H. HART, U. S. A., broadcasting from WNYC the Plattsburgh training methods. (Underwood & Underwood.)

**New Broadcasters**

SIXTEEN new class A stations have been licensed while seven stations have transferred from Class C to A and one from class C to B. Two new class B stations are added.

**New Class A**

Call	Stations	Meters
KFKU	—University of Kan., Lawrence, Kan.	275
WBCN	—Foster & McDonnell, Chicago, Ill.	266
WFBZ	—Knox College, Galesburg, Ill.	254
WGGB	—Harry H. Carman, Freeport, N. Y.	244
KPPC	—Pasadena Presbyterian Church, Pasadena, Cal.	229
KFUP	—Fitzsimmons General Hospital, Denver, Colo.	234
KFUQ	—Julius Brunton & Sons Co., San Francisco	234
KFUR	—H. W. Peery & C. Redfield, Ogden, Utah	224
KFUS	—Louis L. Sherman, Oakland, Cal.	233
KFUT	—University of Utah, Salt Lake City, Utah	261
KFUU	—Colburn Radio Laboratories, San Leandro, Cal.	224
WDDB	—Gilham-Schoen Elec. Co., Atlanta, Ga.	278
WGBF	—The Finke Furniture Co., Evansville, Ind.	217.3
WGBG	—Breitenbach's Radio Shop, Thirfton, Va.	226
WGBH	—Fall River Herald Publ. Co., New England States (portable)	209.7
WSAG	—Loren Venderbeck Davis, St. Petersburg, Fla.	226

**New Class B**

KOA	—General Electric Co., Denver, Colo.	323
WTIC	—The Travelers Insurance Co., Hartford, Conn.	349

**More Money is in Sight For Interference Fight**

WASHINGTON. A DETERMINED campaign against the elimination of man-made interference to radio reception will shortly be started by the Radio Bureau of the Department of Commerce, it is expected.

The Budget Bureau has approved an additional appropriation for this service which may allow the field force of radio inspectors and supervisors to be doubled. While it is not yet definitely known what the amount will be it is believed it will be more than \$100,000.

The recommendation for an additional

appropriation for the Radio service will be sent to Congress within the next few days where speedy action on it is anticipated. As the recommendation has the approval of President Coolidge it is believed it will be adopted.

**NEUTRODYNE KIT \$19.75**

Complete kit of licensed Neutrodyne parts including panel, tube sockets, rheostats, jack, fixed condensers and grid leak. Neutroformers complete with variable condensers and neutrodons. Every part included even to screws and wire. Easy read plans.

Send No Money Order by Postnote

Pay the Postman

HELENA MONTANA RADIO SURPLUS STORES

**Nolte Low Loss Coils Self Supporting Type**



T. R. F. COILS SELF BALANCED F24 (3), \$4.50

JOURNAL ONE KNOB COIL F25, \$1.25

JOURNAL FILTER TUNER COILS F23 (2), \$2.50

WAVE TRAP FILTER COIL F22, \$1.50

**NOLTE MFG. CO.**

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61 GAUTIER AVE. JERSEY CITY, N. J.

**NOW \$3.50 CO.**

Direct from factory to you!

**THE RABAT SENIOR**  
4200 MIL. AMPS. CAPACITY

**FOR A LIMITED TIME ONLY**  
You can purchase for \$3.50 a 22 cell 22 volt RABAT SENIOR battery. Saving \$6.10 through direct buying. The Jobber and Dealers profit now is yours. 22 cell 48 watt size \$7.00.

**Rabat Senior Batteries**  
are most powerful, consistent and will harmonize with any Radio Set. Separate cells and patented rubber cork prevent current leakage and clear glass tubes give vision of the condition of battery. Heavy duty plates 3/16" x 1" x 2 1/2" with staggered ribbed grid form the backbone of this sturdy battery. Shipped completely charged ready for instant use. And you can save \$6.10 by ordering now.

**RABAT JUNIOR BATTERY \$2.15 c. o. d.**  
14 cells 24 volts 1200 M.A. CAPACITY  
Incomparable in price and performance. Designed to satisfactorily operate sets equipped with 3 tubes or less. Constructed of the same high grade materials as used in our Senior battery. Shipped dry, uncharged. Order today and save \$1.81.  
Rabat batteries can be recharged at home at a very low cost.

**Rabat Super-Charger \$3.00 c. o. d.**  
Is specially designed to satisfactorily recharge any make of storage "B" battery. Shipped complete ready to use, including lamp socket, attachment plug and cord. You save \$1.80 by ordering direct.

**SEND NO MONEY**  
But write us today, advising quantity and type wanted. After examining and approving these wonderful batteries then pay the Expressman the small C.O.D. charges.  
The Rabat guarantee is back of all our products. DON'T WAIT. ORDER TODAY and save the middleman's profit.

**THE RADIO RABAT COMPANY**  
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New York's newest and most beautifully furnished hotel—accommodating 1034 guests

ROOM WITH PRIVATE TOILET \$2.50  
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ALL OUTSIDE ROOMS.

Equal distance from Pennsylvania and Grand Central—Walking distance to Times Square and the shops. All transportation lines at our door—Broadway at 63rd St. Within the zone of Columbus Circle (Central Park and 59th St) the most important motor objective in the world.

*P.V. Land, Manager*

**NOW - its the "SELF ADJUSTING" RHEOSTAT**

No more guessing and uncertainty as to your tube filament voltage. AMPERITE inside your set, one for each tube, automatically gives just the right current to bring the most out of every tube. Simplifies wiring and operation. Increases set compactness. Lengthens tube life. Tested, proved and adopted by more than 50 set manufacturers. The set you buy or build will not be up-to-the-minute in effectiveness without it.

**\$1.10 Everywhere**

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SIMPLY TO INTRODUCE THEM

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Type M199 NET, 2.00  
Type M200, Type M201A

All Tubes Guaranteed.  
Agents and Dealers Wanted.

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903 BROAD STREET NEWARK, N. J.

**EFFICIENT!**

*Will do anything that any five-tube receiver has ever done under the same circumstances.*



**BEAUTIFUL!**

*The outward appearance is of an original, artistic design, usually classed as "handsome."*

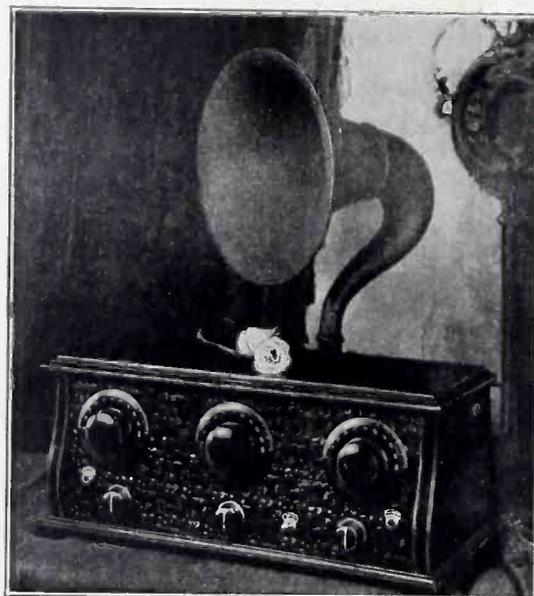
RECENTLY REGISTERED THE EUROPEAN STATIONS FIVE EVENINGS IN SUCCESSION!

**FIVE TUBE  
RADIO FREQUENCY  
TYPE 5A**

THE INTERIOR WORKMANSHIP AND DESIGN WILL PROVE A PLEASANT SURPRISE!

**MAKE US  
PROVE OUR  
CLAIMS**

*You will never be ashamed to own this handsome instrument*



**\$50**

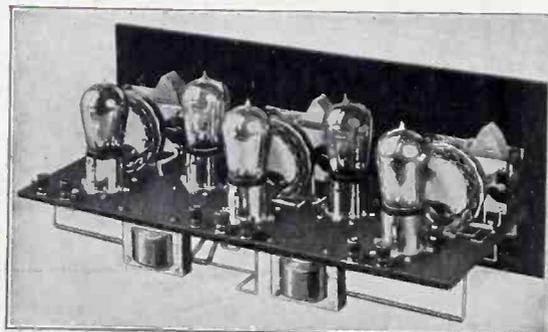
**COMPLETELY  
ASSEMBLED**

*Without Tubes*

*You can pay more but cannot buy a better receiver at any price*

**CLARITY—VOLUME**

**Send No Money  
Pay the Postman**



**All Shipments Made  
Within 24 Hours**

If, after THREE DAYS, you decide that the receiver is not everything we claim, ship it right back to us.

**WE WILL REFUND  
YOUR MONEY BY  
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This receiver has brought in the broadcasting from coast to coast. The most efficient type of receiver ever designed. 7x18 GENUINE MAHOGANY CABINET INCLUDED. (Not an imitation.) (Without tubes.)

Send us your name and those of your friends. We will place you on our mailing list and send you the PERRY WEEKLY RADIO TALKS. They are free and will be a liberal education in radio in the course of a few weeks.

**DEALERS AND REPRESENTATIVES SEND US YOUR NAMES AND ADDRESSES**

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