

A SET
THAT
WORKS
WITHOUT
ANY
AERIAL
OR
GROUND

RADIO WORLD

Title Reg. U. S. Pat. Off.

THE
INSIDE
SECRETS
OF A
STUDIO
TOLD
BY AN
EXPERT

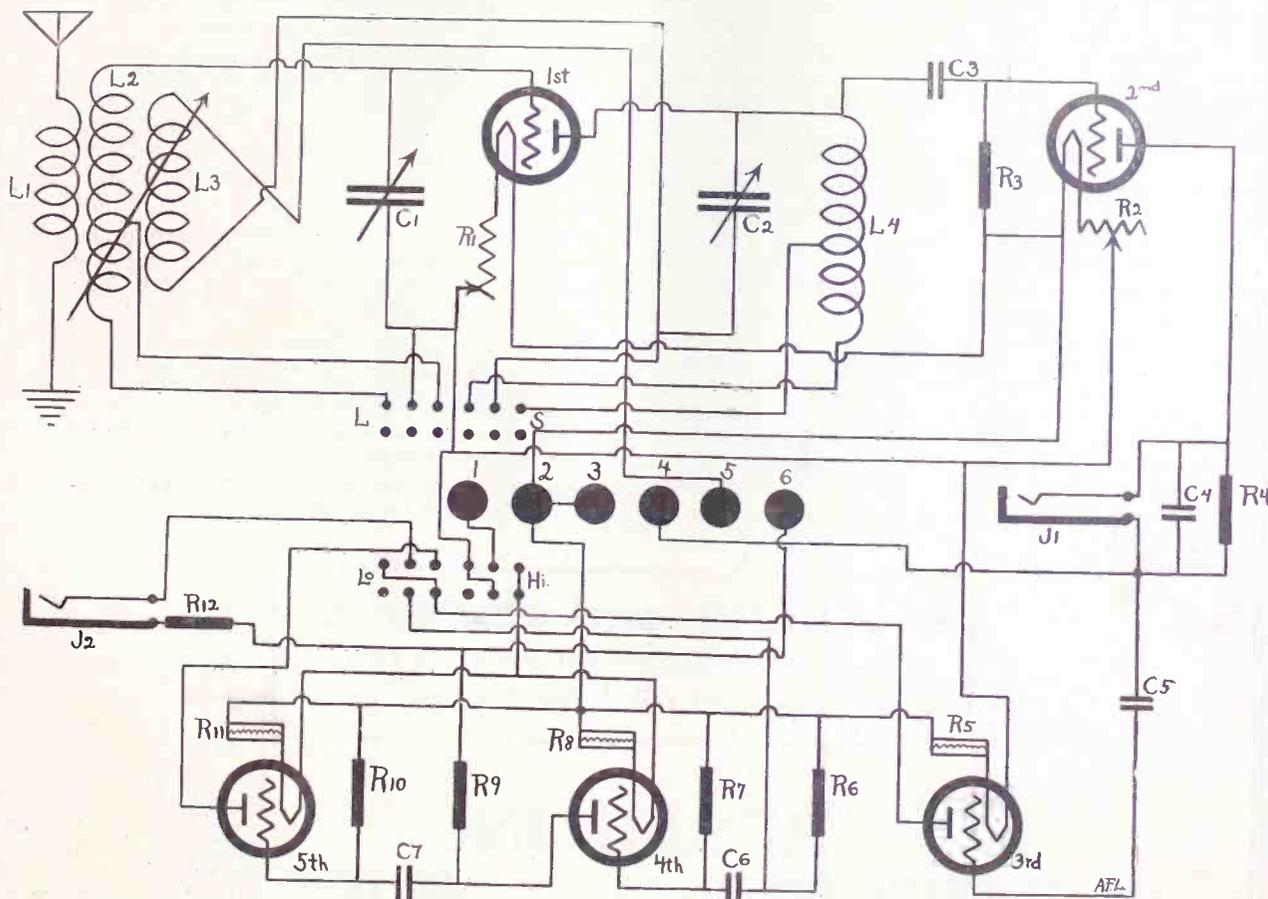
VOL. 5. NO. 22.

135-126

ILLUSTRATED

EVERY WEEK

LOW-LOSS SUPERDYNE WITH THREE STAGES OF RESISTANCE AF



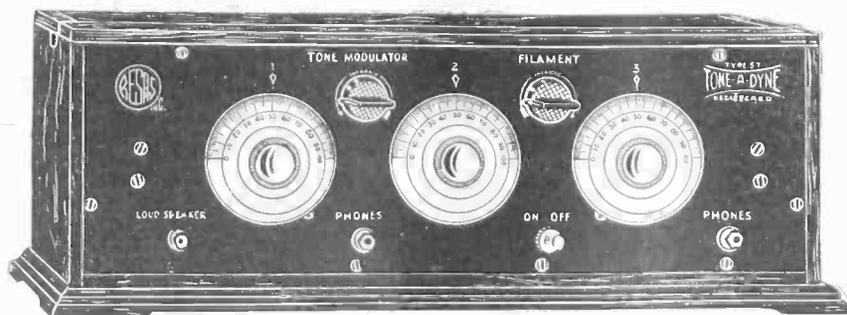
CIRCUIT NETWORK of the Low-Loss Superdyne, with three stages of resistance-coupled audio-frequency amplification. See Page 13.

A SELECTIVE CRYSTAL CIRCUIT

\$78

THE BEST BUY
of the year

\$78



The RESAS TONE-A-DYNE

A Noteworthy Improvement in Radio Reception

AFTER a year of research by our engineers, we are ready to announce the perfected TONE-A-DYNE, the set with THE TONE MODULATOR, an exclusive feature.

THE TONE MODULATOR, as its name implies, regulates the tone and volume. Neither music nor voice can be pleasing to your ear when you are compelled to listen to a reproduction having greater volume than the original.

The simplicity and ease with which tone and volume are controlled by means of The TONE MODULATOR is remarkable. There are only three dials. They may be accurately calibrated, and are matched, so that all three dial settings correspond. All who have had the pleasure of listening to The TONE-A-DYNE have declared it to be a new departure in tone, volume, simplicity, rugged mechanical construction and receiving range. Its selectivity is almost uncanny. With local stations broadcasting on a wavelength having only 5 meters difference, station WHAS (Louisville) has been readily tuned in without interference on only a short indoor aerial. The TONE-A-DYNE is non-radiating and causes no interference to

your neighbor. The TONE-A-DYNE has only one filament control, which can be set accurately on reception of the first station, and one TONE MODULATOR which can be adjusted to suit your individual requirements.

TONE-A-DYNE is the ideal receiver. West Coast Broadcasting stations are copied regularly in the East on this instrument under favorable operating conditions. It can be used satisfactorily on a small indoor antenna, giving long distance reception on a loud speaker. Excellent results have been obtained by using a ground only.

Letters from every section of the country praising the operating qualities of the five-tube RESAS TONE-A-DYNE, the set with The TONE MODULATOR.

"It is the most selective receiver we have ever heard."

"It is the most sensitive set I have ever used; with WOR, operating on 405 meters, I was able to tune them out and tune in WDAR and WHAS."

"KGO, California, comes in with the same volume we have heretofore received Chicago."

"This set gives the most natural reproduction of Broadcast Music I have ever heard."

DEALERS and JOBBERS

An attractive proposition is open to you.

Write At ONCE For Details

RESAS, INC.

112 CHAMBERS STREET

NEW YORK, N. Y.

Salesmen: Energetic live wires can make real money by demonstrating The Resas TONE-A-DYNE. Territories being assigned.

RADIO WORLD

[Entered as second-class matter, March 28, 1922, at the Post Office at New York, N. Y., under the Act of March 3, 1879].

A Weekly Paper Published Every Wednesday and Dated Saturday, by Hennessy Radio Publications Corporation from Publication Office, 1493 Broadway, New York, N. Y. Phones: Lackawanna 6976 & 2063.

Vol. V. No. 22. Whole No. 126

August 23, 1924

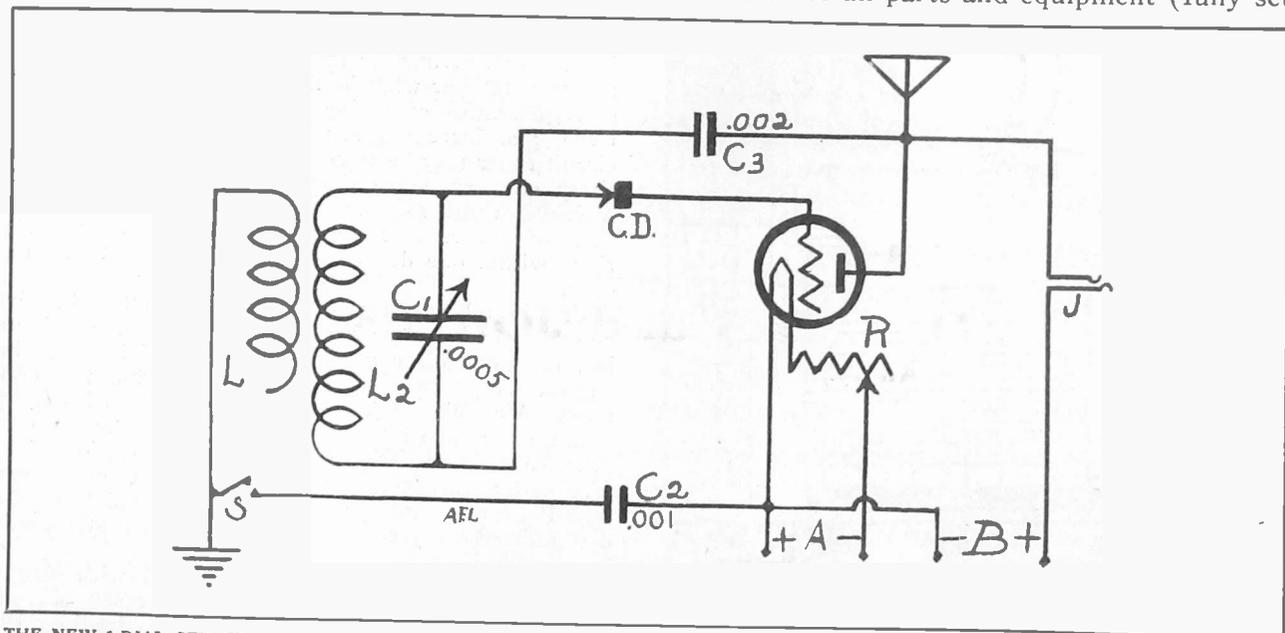
15c. per copy, \$6.00 a year

A Low-Loss Single-Dial Set

MARVELOUS Quality, Great DX-Getting Powers, Extreme Simplicity of Construction and Operation, Excellent Selectivity, plus Inexpensiveness, Make This Circuit a Wonder—Regeneration May Be Used or Omitted by Switching—Fixed Crystal Replaces Leak on Grid Condenser—The Specially-Designed Spider-Web Coil May Be Made in Twenty Minutes, Set Finished in Two Hours, 15 Minutes—Cost of Author's Set, Complete, Including Everything, Tubes, All Batteries, Aerial, Cabinet and Earphones, etc., \$21.80.

By Herman Bernard

THE circuit presented herewith is that of a new single-dial set which has excellent DX possibilities, produces good volume and affords a fine quality of reception. The difficulty encountered in designing a one-dial set is to obtain selectivity without constituting the set a persistent offender of the unwritten law against radiation. The present circuit is a happy compromise, in that it is changed from a non-regenerative to a regenerative hookup by switching. The push-pull switch is shown at S in the circuit network (Fig. 1). It took me exactly two hours and 15 minutes to complete this set, installed in cabinet, and the total cost of all parts and equipment (fully set



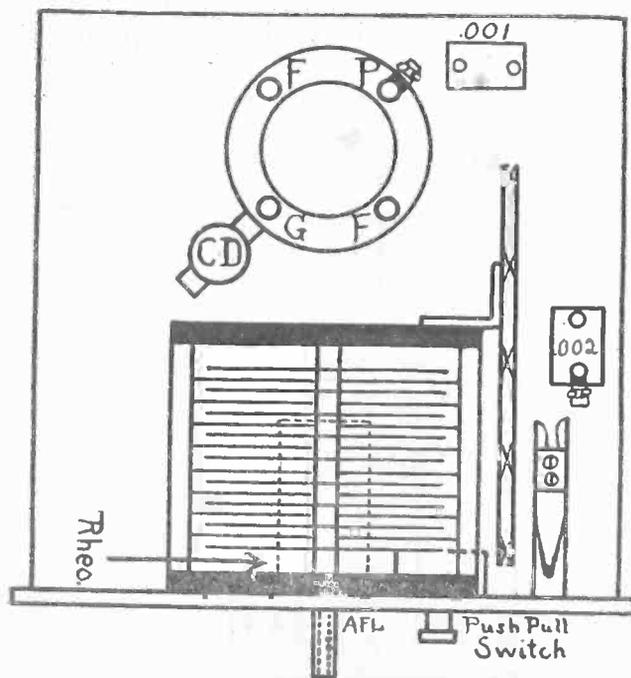
THE NEW 1-DIAL SET (Fig. 1) devised and designed by the author. The primary, L, consists of ten turns, wound in special fashion on a spider-web form, and L2 of 42 turns on the same form, both being closely coupled. S is a push-pull switch which, when set as shown in diagram, makes the set function in improved audion fashion, being non-regenerative. By pulling out the switch the ground is connected to A plus and the set becomes regenerative, requiring nice adjustment of the rheostat. C1 is a 23-plate low-loss variable condenser, CD a fixed crystal, which does not function as a detector. C2 and C3 are fixed condensers, .001 and .002 mfd. respectively. R is the carbon-pile rheostat, J the single-circuit jack. Notice that one terminal of L is never connected to anything. This method was devised to obtain selectivity. The set is simple to build, easy to operate and fits snugly on a 7 x 7 inch panel. The tube used was UV199, requiring a 4 1/2-volt C battery. The B battery voltage is 22 1/2, but slightly louder signals were obtained by using 45 volts of B battery.

Assembly Plan for Bernard's Set

forth in the ensuing list of parts) was \$21.80. Features combined in this circuit may be summed up as follows:

THE author, who has been experimenting with single dial sets for several months, says he has found none better than the one he describes in his article herewith. He is of the opinion it is the best single-dial set achieved so far. Tested by Radio World, this set produced wonderful quality, due to the achievement of true resonance. DX was obtainable without regeneration, but the set easily reached out 1,000 miles with regeneration using a 150-foot aerial, 20-foot lead-in extra. The author describes how to prevent radiation. — Editor.

1. The use of a solo coil, whereby the ground alone is metallically connected to one end of the coil L and the other end remains open always. When the switch is turned on the coil L at ground is connected also to the A+, but the end of the coil still remains open.
2. A fixed crystal is fastened to the grid post of the socket, making a leak unnecessary. It does not function as a detector.
3. The grid return is to the plate, the .002 fixed condenser (C3) operating as a grid condenser and blocking the plate current.
4. By switching, a simple audion circuit of moderate selectivity, excellent for ordinary conditions, is in use, or a highly selective regenerative circuit.



CONSTRUCTIONAL LAYOUT (Fig. 2) of the single-dial set. The socket is for UV199 or C299 tubes, the grid and plate posts being opposite each other, instead of side by side, which is characteristic of this type. The fixed crystal, marked CD, is affixed to the grid post, right on the socket. The variable condenser, the only tuning control, is shown on this top view, with the carbon-pile rheostat in dotted lines underneath. The A plus may be connected to the F post on the socket at right in the diagram. The coil is shown mounted on the back of the variable condenser with a brass angle. To the P post on the socket a clip is attached. Also a clip is fastened to one side of the .002 fixed condenser. The push-pull switch is next to the rheostat knob, which is between the condenser dial and the jack.

cuit. As 60 per cent. of all reception is from local stations, and the non-regenerative circuit may be used exclusively for this work, radiation is prevented entirely to this extent. If regeneration is used it is kept under control by operation of the rheostat, which one must know how to use properly.

As some fans are not deeply interested in DX reception they may use the non-regenerative hook-up exclusively. This was good for 50 miles in mid-Summer on the first set ever built on this design.

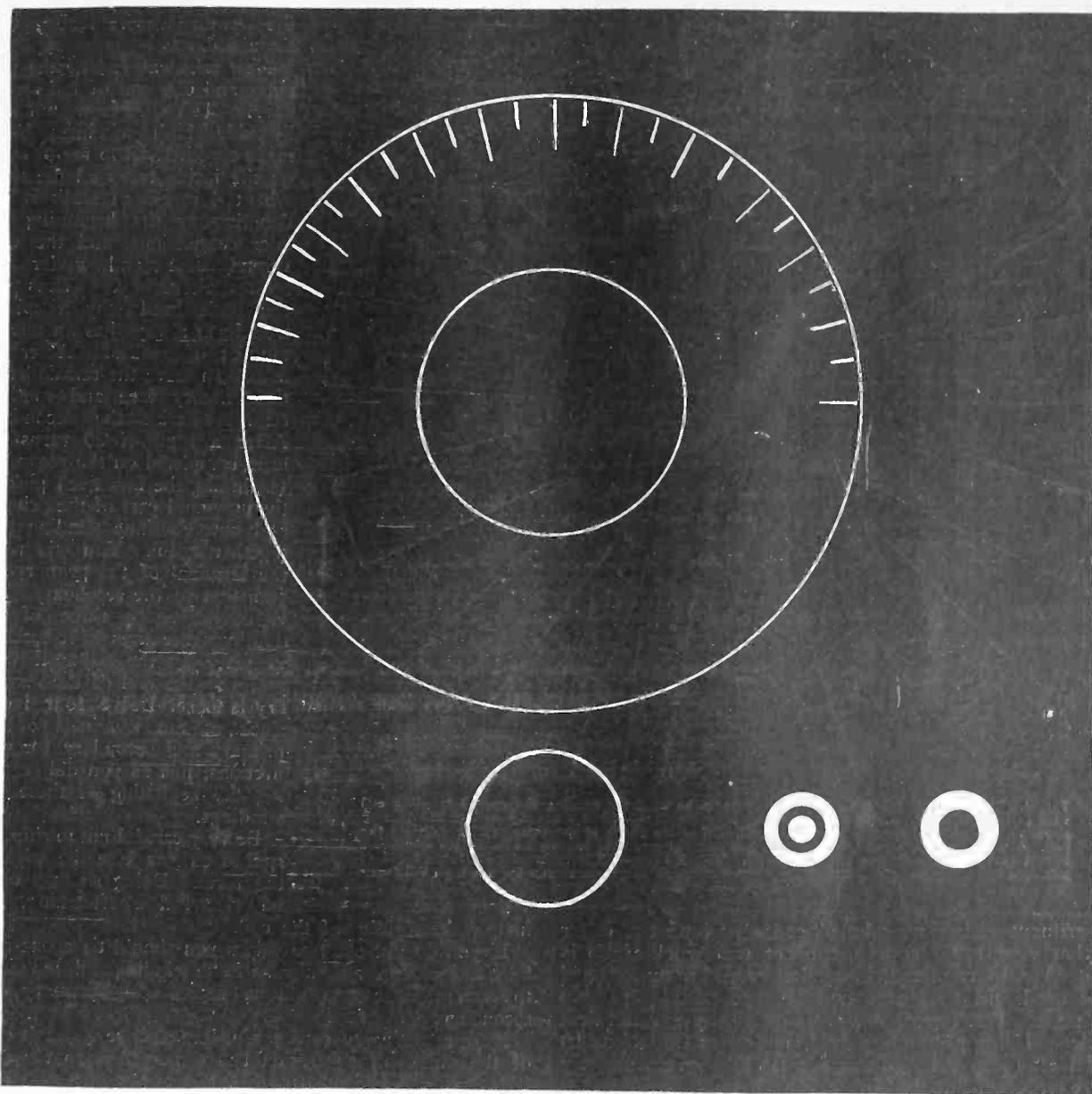
As intimated, there is some sacrifice in selectivity when regeneration is not cut in. So at least, if interference troubles you, due to proximity to high-power stations within close wavelength range of one another, you have the remedy. My set, used in Brooklyn, N. Y., six miles from both WYNC (526 meters) and WFAF (492 meters), turned sharply enough, without regeneration, not only to prevent cross-talk but to allow 5 degrees of the dial for absolute silence between these two wavelengths when both stations were radio-casting at 1,000 watts, the highest the law allows for regular programs. With regeneration the set tuned out stations 13 meters apart and reached out 1,000 miles.

The phenomenon of regeneration is familiar and its use popular. Unfortunately, due largely to ignorance of the correct way to tune or indifference to the welfare of others, many regenerative sets are needlessly permitted to offend by squealing. They act as small stations transmitting exasperating whistles over a wide band. Such inconsiderate tactics are not to be condoned. But suggestions of a law to prohibit the use of regenerative sets, in my personal opinion, are rather too severe. We do not ban the use of automobiles, yet many persons are killed or injured by them. If a person is at fault, why prohibit the use of the serviceable and otherwise harmless machine he operates? Regeneration is the most important invention in the field, next to radio itself, because it alone permits program transmission and the use of only a 1-tube receiving set for hearing local and distant stations (1,200 to 1,500 miles being not at all uncommon in Winter), giving the fan with little money to spend a chance to hear what he likes best. This is the result of regeneration endowing the set with extreme selectivity and increased sensitivity. For instance, a 3-circuit tuner may be so constructed as to possess selectivity comparable to that of the Super-Heterodyne, which is more selective than present needs require. The 3-circuit tuner can get three of four different stations within one degree of the dial, without interference.

But in all regenerative sets there must be two controls—one for wavelength, the other for volume, i.e., regeneration control. The single-dial set is included. A set may have only one dial, but two controls. A popular "1-knob" set is a 2-knob set in reality because the rheostat controls regeneration and its resistance must be varied for almost every station. The fact that a rheostat is not calibrated does not prove that it is not a ratable control. You could leave the dial numbers off your wavelength dial but it still would be a control.

Nothing much has been accomplished with single-control 1-tube sets, except for the one presented here. When the regeneration is switched on, frankly, the set is in the 2-control class. You will discover the admission in all "1-knob" sets when you see that a vernier rheostat is recommended. I used a Filkostat, with affixed switch. By pushing in the switch the A

Panel Is Only a Handful



YOU CAN STRETCH YOUR HAND so your little finger and thumb will be as far apart as possible and you will overreach the panel width of the 1-dial set by about two inches (Fig. 3). The panel is printed herewith at its actual size, 7" x 7". The 4" dial is attached to the shaft of the 23-plate variable condenser, the panel being drilled for this shaft so that the shaft center is $2\frac{1}{2}$ " from the panel top and $3\frac{1}{2}$ " from either side of the panel. Below the dial is the rheostat knob. At right of this is the push-pull switch, shown in double-circle effect, and at extreme right is the single-circuit jack.

A.E.L.

current is turned off, hence the former drawback of tiresome turning and turning to put the light out is overcome. (Do not confuse this switch with S in Fig. 1.)

The selectivity is enhanced by the use of the solo coil. This is the primary. I call it "solo" because metallic connection is made always to one terminal only, the end being left free always. As this coil is used exclusively to transfer energy by induction, no metallic contact being made except to the ground, dead-end loss does not occur. The same terminal of the coil that goes to the ground is connected metallically to the A+, but only when regeneration is used, and this may not be often.

Not only are losses carefully guarded against here, but everything about the circuit makes for efficiency.

The primary and secondary are wound on one spider-web form and no other coil is used. The form is then removed, leaving no insulation except that on the wire itself, reducing the losses in the coil so low that scientists are baffled to compute them! Also, a low-loss variable condenser should be used.

The set is very easy to build. A person knowing nothing at all about radio, even being unable to read a diagram, can build it successfully, learning as he goes what the diagram means.

I would advise anybody desiring to build this circuit to follow the original faithfully, with one possible exception for leeway. Instead of C3 being .002 it may be of lower capacity, or a variable grid condenser used. As part of that option C3 may be moved to the other end of L2 and placed in series with the crystal. As an

Assembly Plan for Bernard's Set

forth in the ensuing list of parts) was \$21.80. Features combined in this circuit may be summed up as follows:

THE author, who has been experimenting with single dial sets for several months, says he has found none better than the one he describes in his article herewith. He is of the opinion it is the best single-dial set achieved so far. Tested by Radio World, this set produced wonderful quality, due to the achievement of true resonance. DX was obtainable without regeneration, but the set easily reached out 1,000 miles with regeneration using a 150-foot aerial, 20-foot lead-in extra. The author describes how to prevent radiation. — Editor.

1. The use of a solo coil, whereby the ground alone is metallically connected to one end of the coil L and the other end remains open always. When the switch is turned on the coil L at ground is connected also to the A+, but the end of the coil still remains open.

2. A fixed crystal is fastened to the grid post of the socket, making a leak unnecessary. It does not function as a detector.

3. The grid return is to the plate, the .002 fixed condenser (C3) operating as a grid condenser and blocking the plate current.

4. By switching, a simple audion circuit of moderate selectivity, excellent for ordinary conditions, is in use, or a highly selective regenerative cir-

cuit. As 60 per cent. of all reception is from local stations, and the non-regenerative circuit may be used exclusively for this work, radiation is prevented entirely to this extent. If regeneration is used it is kept under control by operation of the rheostat, which one must know how to use properly.

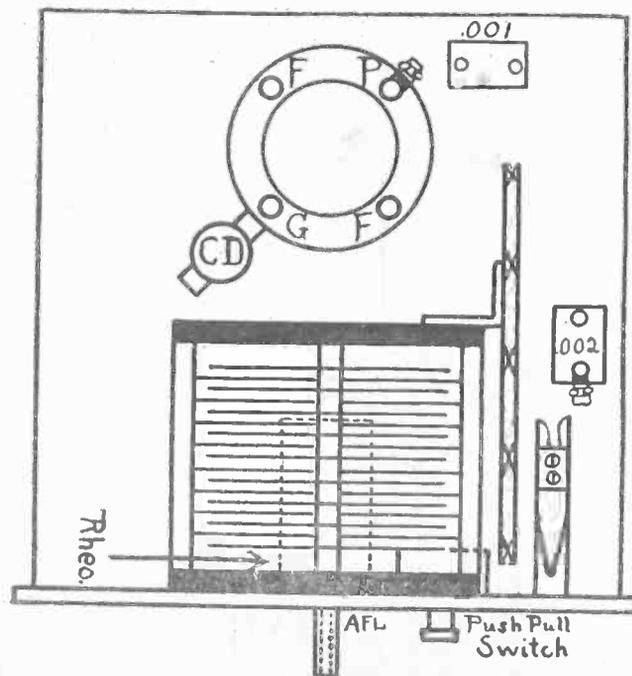
As some fans are not deeply interested in DX reception they may use the non-regenerative hook-up exclusively. This was good for 50 miles in mid-Summer on the first set ever built on this design.

As intimated, there is some sacrifice in selectivity when regeneration is not cut in. So at least, if interference troubles you, due to proximity to high-power stations within close wavelength range of one another, you have the remedy. My set, used in Brooklyn, N. Y., six miles from both WYNC (526 meters) and WFAF (492 meters), turned sharply enough, without regeneration, not only to prevent cross-talk but to allow 5 degrees of the dial for absolute silence between these two wavelengths when both stations were radiocasting at 1,000 watts, the highest the law allows for regular programs. With regeneration the set tuned out stations 13 meters apart and reached out 1,000 miles.

The phenomenon of regeneration is familiar and its use popular. Unfortunately, due largely to ignorance of the correct way to tune or indifference to the welfare of others, many regenerative sets are needlessly permitted to offend by squealing. They act as small stations transmitting exasperating whistles over a wide band. Such inconsiderate tactics are not to be condoned. But suggestions of a law to prohibit the use of regenerative sets, in my personal opinion, are rather too severe. We do not ban the use of automobiles, yet many persons are killed or injured by them. If a person is at fault, why prohibit the use of the serviceable and otherwise harmless machine he operates? Regeneration is the most important invention in the field, next to radio itself, because it alone permits program transmission and the use of only a 1-tube receiving set for hearing local and distant stations (1,200 to 1,500 miles being not at all uncommon in Winter), giving the fan with little money to spend a chance to hear what he likes best. This is the result of regeneration endowing the set with extreme selectivity and increased sensitivity. For instance, a 3-circuit tuner may be so constructed as to possess selectivity comparable to that of the Super-Heterodyne, which is more selective than present needs require. The 3-circuit tuner can get three of four different stations within one degree of the dial, without interference.

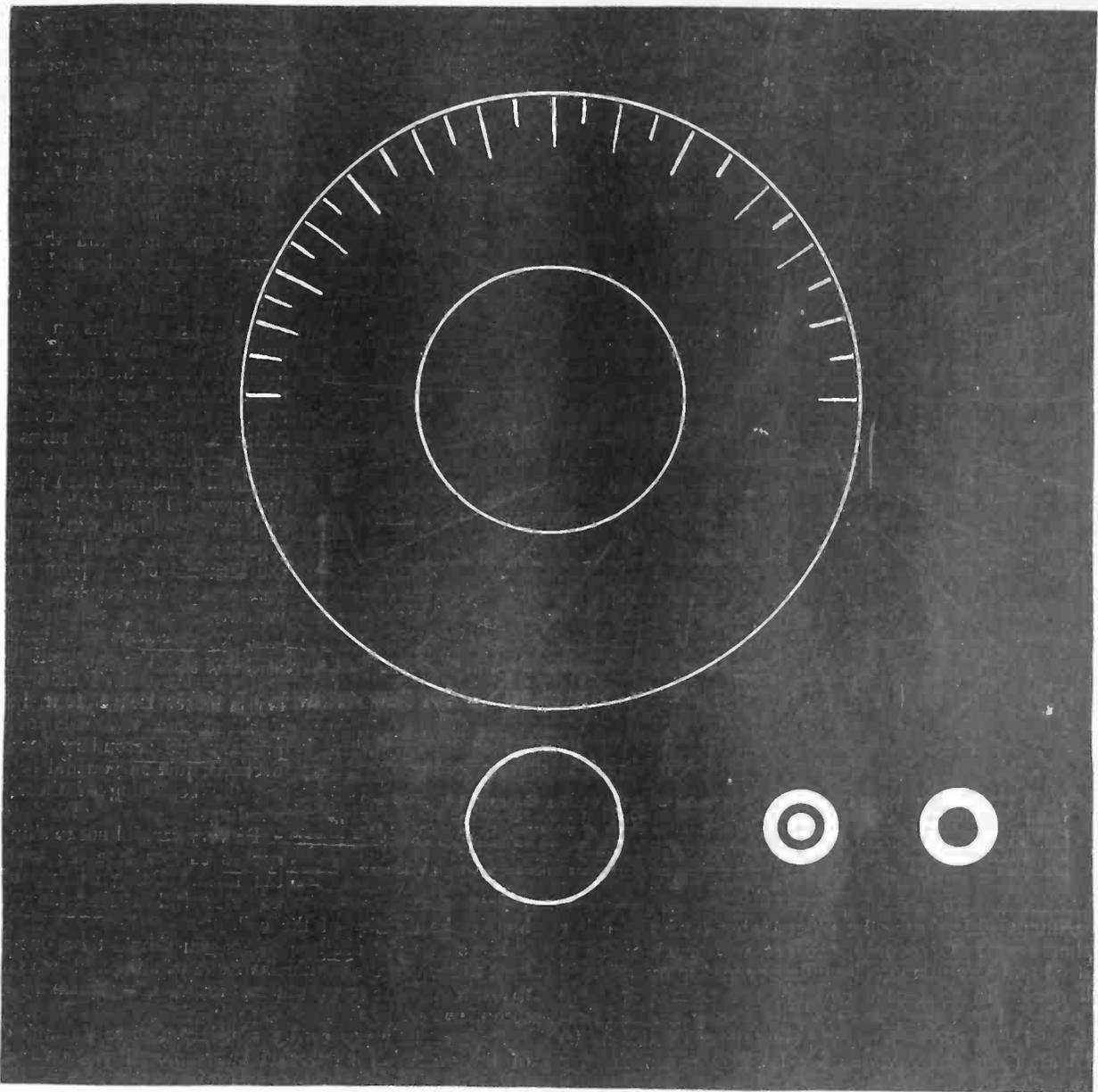
But in all regenerative sets there must be two controls—one for wavelength, the other for volume, i.e., regeneration control. The single-dial set is included. A set may have only one dial, but two controls. A popular "1-knob" set is a 2-knob set in reality because the rheostat controls regeneration and its resistance must be varied for almost every station. The fact that a rheostat is not calibrated does not prove that it is not a ratable control. You could leave the dial numbers off your wavelength dial but it still would be a control.

Nothing much has been accomplished with single-control 1-tube sets, except for the one presented here. When the regeneration is switched on, frankly, the set is in the 2-control class. You will discover the admission in all "1-knob" sets when you see that a vernier rheostat is recommended. I used a Filkostat, with affixed switch. By pushing in the switch the A



CONSTRUCTIONAL LAYOUT (Fig. 2) of the single-dial set. The socket is for UV199 or C299 tubes, the grid and plate posts being opposite each other, instead of side by side, which is characteristic of this type. The fixed crystal, marked CD, is affixed to the grid post, right on the socket. The variable condenser, the only tuning control, is shown on this top view, with the carbon-pile rheostat in dotted lines underneath. The A plus may be connected to the F post on the socket at right in the diagram. The coil is shown mounted on the back of the variable condenser with a brass angle. To the P post on the socket a clip is attached. Also a clip is fastened to one side of the .002 fixed condenser. The push-pull switch is next to the rheostat knob, which is between the condenser dial and the jack.

Panel Is Only a Handful



YOU CAN STRETCH YOUR HAND so your little finger and thumb will be as far apart as possible and you will overreach the panel width of the 1-dial set by about two inches (Fig. 3). The panel is printed herewith at its actual size, 7" x 7". The 4" dial is attached to the shaft of the 23-plate variable condenser, the panel being drilled for this shaft so that the shaft center is $2\frac{1}{2}$ " from the panel top and $3\frac{1}{2}$ " from either side of the panel. Below the dial is the rheostat knob. At right of this is the push-pull switch, shown in double-circle effect, and at extreme right is the single-circuit jack.

AFL

current is turned off, hence the former drawback of tiresome turning and turning to put the light out is overcome. (Do not confuse this switch with S in Fig. 1.)

The selectivity is enhanced by the use of the solo coil. This is the primary. I call it "solo" because metallic connection is made always to one terminal only, the end being left free always. As this coil is used exclusively to transfer energy by induction, no metallic contact being made except to the ground, dead-end loss does not occur. The same terminal of the coil that goes to the ground is connected metallically to the A+, but only when regeneration is used, and this may not be often.

Not only are losses carefully guarded against here, but everything about the circuit makes for efficiency.

The primary and secondary are wound on one spider-web form and no other coil is used. The form is then removed, leaving no insulation except that on the wire itself, reducing the losses in the coil so low that scientists are baffled to compute them! Also, a low-loss variable condenser should be used.

The set is very easy to build. A person knowing nothing at all about radio, even being unable to read a diagram, can build it successfully, learning as he goes what the diagram means.

I would advise anybody desiring to build this circuit to follow the original faithfully, with one possible exception for leeway. Instead of C3 being .002 it may be of lower capacity, or a variable grid condenser used. As part of that option C3 may be moved to the other end of L2 and placed in series with the crystal. As an

Spider-Web Form for Coil

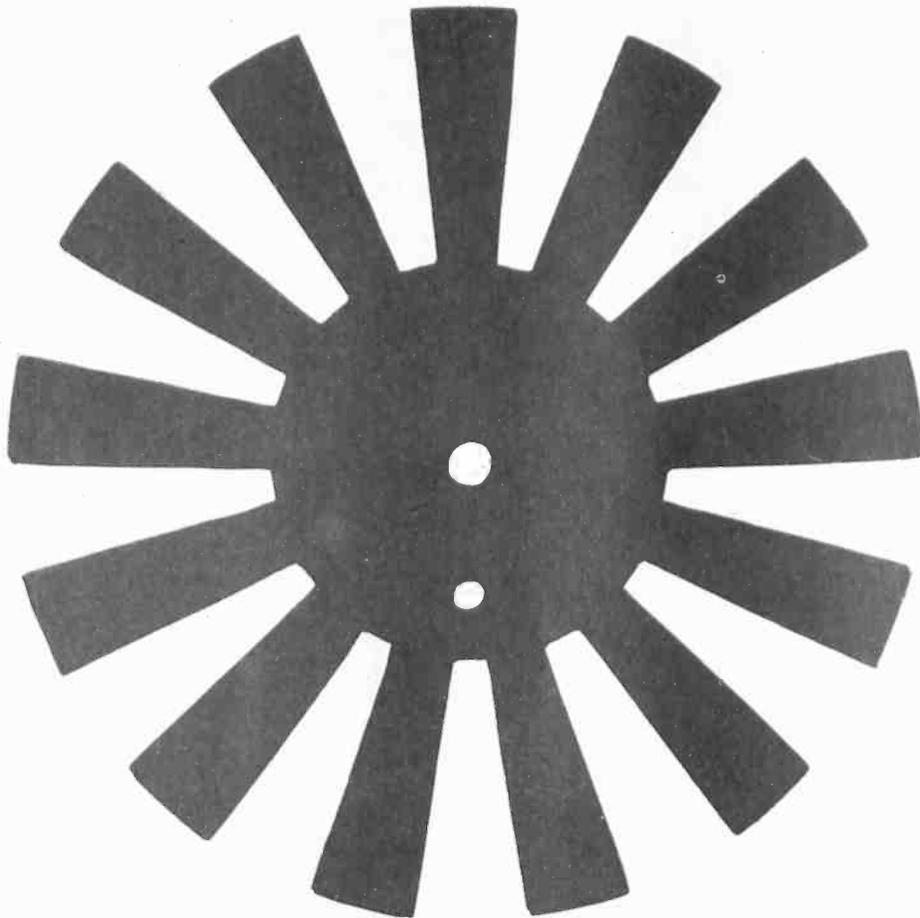


Fig. 4. The template for the spider-web form to be used for winding the special low-loss coil used in Bernard's set. Using tracing paper, copy the form. Next paste the ends of the tracing paper on a cardboard square. Cut the cardboard to the shape of the template. Then wind the coil. After the coil is wound the cardboard is entirely removed, leaving no insulation whatever, except that silk or cotton on the wire itself. This low-loss coil is in keeping with the low-loss principle followed throughout the entire construction and largely accounts for the high efficiency of the new circuit.

experiment either may be placed ahead of the other in that event. Of course, the set will work if C3 is omitted and a regular grid condenser and mounted grid leak used. In that case connect the aerial direct to the plate. But I wish you would give my method first choice. Using a standard grid condenser (.00025 mfd.) and leak (5 to 9 megohms for UV199) gives slightly more volume, but I think my way enhances quality, while affording ample volume.

Winding the Coil

You may procure a spider-web form with 13 spokes, $4\frac{1}{2}$ " diameter, but as the form must be destroyed in order to remove it and make a very low-loss coil it is just as well to use cardboard. Trace the form which is printed herewith in actual size, using tracing paper or even tissue paper. Put a circle of paste on the back of the tracing paper after the tracing is made, the circle coming $\frac{1}{4}$ " or so inside the ends of the spokes. Thus attach the tracing paper to the cardboard. Cut the form with heavy shears or a sharp knife.

As for the wire, use No. 22, preferably single silk covered, because the insulation comes off the cotton-covered kind too easily for best results. Measure off 11 feet of the wire for the primary and 38 feet for the secondary. This will give you about 10 turns primary and 40 secondary. I found it convenient to use white-covered wire for the secondary and green

for the primary, thus rendering the terminals more readily distinguishable.

Now take one end of the primary and one end of the secondary. The wire is wound side by side, both windings being made together. Keep the primary on the inside track all the time. About 4 inches of slack is left dangling at the beginning for later connections, and the wire wound over and under the spokes alternately. Thus you can understand why a spider-web form always has an uneven number of spokes. After the fifth turn leave the remainder of the primary free and continue on only with the secondary. After a total of 30 turns has been completed on the secondary (including the first five) pick up the unwound part of the primary and now continue winding both together again. You will reach the terminal of the primary before that of the secondary. This is advisable, as three of the terminals are thus kept securely in place by the adjacent wire, and only the end of the secondary is loose. Leave four inches slack at the terminals of the primary and secondary for connections, just as you did regarding the beginning of these two windings.

Be very careful not to skip any spokes as you lace the wire on the form. Doing so may cause no electrical shortcoming, but

impair the rigidity of the coil.

If you do not use two colors you should tie a one-cord knot to each of the terminals of one winding and two pieces to each of the two others, representing primary and secondary.

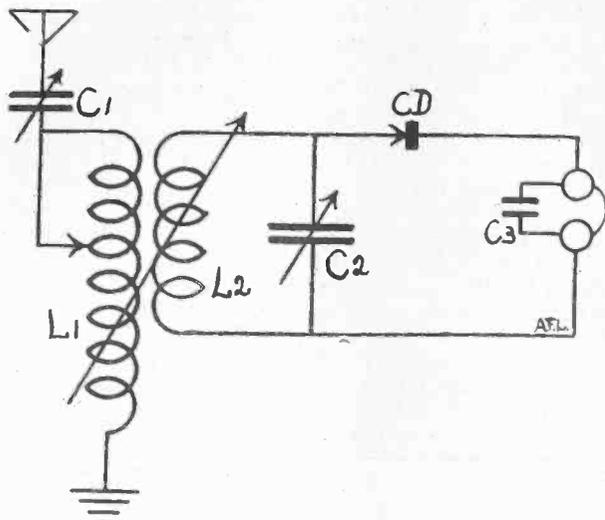
Now resorting to cord again, lace a piece through each of the points of separation between spokes, so the cord goes from the inside of the aperture around the width of the winding to the circumference and back to the starting place, where it is knotted. This prevents the coil from spreading. After the thirteenth piece of cord is secured, cut the spokes, one at a time, where they enter the small central circle. As each spoke is severed, pluck it from the winding. When the last one is cut the center will fall out. The thirteen cord fastenings will hold the coil in place with surprising security.

Mounting the Parts

First mount the variable condenser on the panel, as shown in Fig. 3. The shaft hole should be drilled $3\frac{1}{2}$ " from either side and $2\frac{1}{2}$ " from the top. Next mount the rheostat under the condenser. This is done by first placing the dial on the condenser shaft and holding the rheostat against the front of the panel, with knob attached, to make sure that there will be leeway between the dial and the knob. The correct distance having been measured, the center hole is

(Continued on page 28)

A Selective Crystal Set



CIRCUIT NETWORK (Fig. 1) for a selective crystal set. The variable condenser, C1, 43 plates (.001 mfd.) is connected in series with the antenna. The beginning of L1, primary of the variocoupler, is connected to one side of C1 and to the connecting strip of the top switch. Thus dead end losses are averted in using the switch, as inductance is reduced by short-circuiting and any impulses that may stay into the short-circuited area are retained in the coil and not lost. The end of the variocoupler stator connects to the ground. The beginning of the secondary, L2, goes to one side of the crystal, which may be of the fixed or the adjustable, le type, galena preferred, but many other sorts, including synthetic ones, being good. This lead also goes to one side of C2, the 23-plate (.0005 mfd.) variable condenser and to one of the phones. The remaining unconnected side of CD goes to the other phone and a fixed condenser (C3, .002 mfd.) bridges the phones. Excellent quality of received signal will be enjoyed without interference, as the circuit is selective enough to remove the curse attaching to some crystal hook-ups. This set has DX possibilities. Low-loss parts should be used so as to conserve the impulses, which are not as loud as those obtained from a tube set. But the quality of tone, the purity and richness of the voice and music that a crystal set brings in are far superior to tube results.

By Lieut. Peter V. O'Rourke

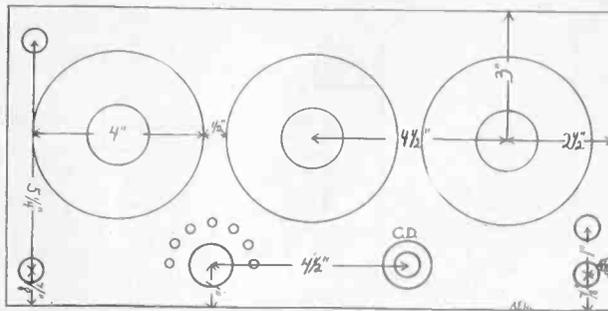
GRANTED that you use a circuit that is very selective, the crystal set is in a class all by itself as to quality of reception. Also, it can reach out far beyond the 15 or 25 miles conventionally conceded to it. From Jackson Heights, N. Y., KDKA, East Pittsburgh, Pa., is received regularly and at will with the circuit shown herewith (Fig. 1). This is about 300 miles and the station is heard without interference.

To get selectivity you must have "plenty" of controls on a crystal set. Using the circuit shown in Fig. 1 you can tune out stations 15 meters apart.

Many persons are strong advocates of crystal rectification. The crystal's powers in that direction are wonderful and mysterious. Scientists are still debating just how the crystal functions, though it is well known what happens. The crystal to which the radio-frequency waves are supplied rejects the negative potential, hence only a positive, pulsating, direct current is passed on. This current is in the audible range and actuates the diaphragms of the earphones. The crystal's action in reducing alternating current to audible current constitutes rectification, usually called detection. No tube yet developed can give such pure tones as the almost distortionless crystal, one of radio's enticing wonders.

If a fixed crystal is used you will have to rely on the manufacturer, and this is usually quite safe, but if a catwhisker is to be used, galena may be preferred for distance. Bornite and zincite are good. Some excellent crystal detectors will be found advertised in this issue of RADIO WORLD.

Those who want only best results will use low-loss parts. See RADIO WORLD, issue of July 12, for an easy way to convert your high-loss coils and condensers into low-loss ones; also the issue of August 2,



THE PANEL LAYOUT (Fig. 2) of the selective crystal set shows drilling dimensions for centres of condensers, switch and variocoupler. The dial at left is for C1, the aerial tuning condenser. The center dial is for the variocoupler rotor and the dial at right is for C2, the 23-plate variable condenser. The dials are 4 inches in diameter, the circumference of one being at a minimum distance of 1/2 inch from that of its neighbor. At extreme left are optional binding posts for aerial and ground connections, but the author advises the connections be made direct to C1 and L1. At right are two optional drill holes for phone posts, though instead the phone tips may be passed through the holes to one end of the fixed crystal inside the cabinet and to one end of C2. If a catwhisker crystal is used it may be mounted on the front panel (marked CD). Adjustable crystals usually give better results, but sometimes are trying. If you are to mount switch points, instead of using a ready-made switch, templates and directions in RADIO WORLD, issue of July 19, may aid you. The article is entitled "Solving Panel Troubles."

wherein Byrt C. Caldwell described how to make a low-loss variocoupler, spider-web variety.

PARTS NEEDED

- | | |
|---|--|
| One .001 (43-plate) variable condenser (C1). | Three 4-inch dials. |
| One variocoupler (L1L2) | Two Fahnestock clips. |
| One .0005 (23-plate) variable condenser (C2). | One set of earphones. |
| One tap switch (TS). | One 7 in. by 14 in. panel. |
| One crystal detector (CD). | One 7 in. by 14 in. cabinet. |
| One .002 fixed condenser (C3). | 150 feet aerial wire, 50 feet lead-in wire, connecting wire, solder, lugs. |

Part of the 50 feet of lead-in wire (No. 14 insulated) may be used for connecting the ground to the set. Get an excellent ground connection, as the impulses that the crystal passes on are not voluminous, at best, though delightfully clear.

First mark the panel for drilling, using templates that come with the variable condensers and tap switch. Solder flexible 4" wire leads to lugs and secure the lugs to the tap switch. Use as many taps as are on the switch. If you intend making your own switching device, mount the tap screws with the flat heads on front of the panel, and the two end stops to halt the switch arm. Use five taps. Scrape enough insulation from the variocoupler stator taps (at the beginning, where every turn is tapped). Now you will not cramp your fingers and lose your temper when you make the tap connections after the coupler is mounted.

Mount the switch. Secure the lugs of the tap wires to the switch. Mount the variocoupler. Measure the distance on each tap connecting wire. Leave 1/4" extra, then cut each wire. Scrape the insulation from the 1/4" and now solder the wire to the taps on the coupler.

No provision is made for binding posts, for energy must be conserved and such posts may introduce losses, due to resistance.

Mount the rest of the parts (Fig. 2) and put the panel in a cabinet.

Drill two holes in the back of the cabinet and insert round rubber insulators. Introduce the aerial and ground through these holes.

Most crystals work better one way than the other. Some do not work at all when put in the wrong way. Turn your crystal around after listening in for a while and find out for yourself. The turning will automatically reverse one phone connection and the lead to C2L2.

The only source of losses is the tap switch. However,

No-loss Tap Switch on Crystal Set

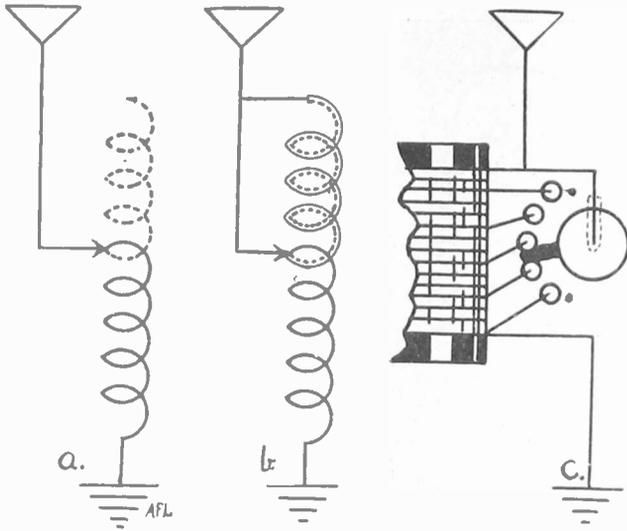


FIG. 3—How to connect a switch so as to avoid dead end losses is shown in B. The unused part of the coil winding (heavy lines) is short-circuited, and if any currents stray from the aerial into the cut-off part of the coil they are utilized. In A currents flowing into the unused part of the coil (shown in dotted line) are lost. Hence, properly to connect the switch, run a lead from the aerial post to the beginning of the coil or connect the aerial direct to the beginning. The same lead is continued to the connecting strip of the switch. The rotation of the switch arm, instead of only calling into play the remaining number of turns on the coil and leaving the other part as a leakage path, short-circuits the unused part of the coil but keeps all energy in the circuit. View B shows connections.

this is unavoidable, for the difficulty of getting selectivity must be overcome at all costs. It is futile to have a set, be it crystal or tube, that brings in two stations at once and plenty of code interference to boot. To compensate as much as possible for these losses the phone tips are inserted through the panel direct to Fahnestock clips on one side of CD and C2L2; also the aerial-ground connections are made direct.

To tune, turn the dial of C1 to 50. Have the tap switch at the first tap, thereby using all the inductance. Turn the knob of the variocoupler until a signal is heard, then clear it up by adjusting C1 and C2. If no signal is heard, simultaneously vary the knobs of the variocoupler and the variable condenser C2. Rotate C1. Now experiment with other tap points for improving signals. Assign numbers 1, 2, 3 etc., to the tap points. Note which tap affords best signals for a given station. Varying the tap contacts may necessitate retuning all other controls. Soon you will learn just how to set the switch and dials for best results from a given station. These settings may have to be changed slightly but probably not. The tap will remain constant for stations within a given wavelength band.

The tap switch should be connected so that no dead end losses will result. Usually a tap switch introduces this objectionable source of losses because some of the energy in the coil passes into a part of the coil which isn't connected metallically to anything, while the rest of the coil has two metallic connections. Thus precious impulses are pocketed. However, by following the system diagrammed in Fig. 3 this source of losses is avoided. Look at A in Fig. 3. This is an example of dead end losses being suffered. The ground is connected to the end of the coil. The top switch connecting strip is joined with the aerial and the part of the coil not engaged by the switch is left unused and offers a path for the escape of impulses. This path of escape is shown by the dotted line. Note that it terminates in "mid-air." But in B of Fig. 3 the correct way of connecting the switch is shown. The aerial is connected to the strip on the switch, as in the

other case, but it is also connected to the beginning of the coil. Thus at no time is the unused part of the coil metallically disconnected from the circuit. The lesser inductance is obtained by moving the switch arm so that it engages switch points connected by wire to the taps on the variocoupler stator. This action short circuits that part between the beginning of the coil and the point where the switch arm makes contact with the point. The heavy dotted line in B shows how any stray impulses that may defy the short circuit are still retained in the coil and as they are at radio frequency they are utilized instead of being lost. The way the switch is connected is shown graphically in B of Fig. 3. For the sake of clarity the entire primary is used as an object lesson, although the reader will understand that only the few taps taken (say, five, as shown in B) would be from unit turns and thus confined to five revolutions on the stator. The taps on the coupler are wire-connected to the switch points, shown in small circles. The switch arm is designated in solid black. This is the movable part of the switch that enables the variations of contact. The connecting strip on the switch is not to be confused with the arm. The strip is shown by a dotted line on C. For those unfamiliar with radio construction one effort at installing a switch in this fashion will clarify the whole situation, for there is nothing like experience as a teacher and nothing that vitalizes advice as to follow it.

Some constructors may desire to use binding posts. It would be possible, of course, to put all of them on the front of the panel. There would be four, two for aerial and ground and one each for the phones. For the phones it would be possible to use phone tip jacks, rather than regular phone jacks. The difference is that the phone tips are directly inserted in phone tip jacks, which catch them with a small spring clip. Phone jacks require a plug, the phones being connected to the plug and the phone leads from the set to the leaves of the jack. Also, those who so desire may mount the crystal on the panel. If a variable crystal, or the cat-whisker type, is used, this should be done. But as for binding posts, they may be avoided to advantage. There is plenty of room on the panel for mounting any of these parts or accessories, and the only advice necessary is that they be mounted at such place as affords most convenient and shortest access to the point in the set with which they connect.

WIRING DIRECTIONS

1. Connect the aerial directly to the stator plates of the .001 variable condenser C1. Connect the rotor plates of this condenser to the connecting strip (not the movable arm) of the tap switch. Connect the end of the variocoupler stator (L1) to the ground.

2. Connect the beginning of the variocoupler rotor (L2) to one side of the variable condenser C2 (23 plates) and to one side of the crystal detector (CD). The crystal may be fixed or adjustable. I prefer the adjustable type, though the other is handier. The remaining unconnected side of C2 is connected to the free end of L2, this lead continuing to one of the phones. The other phone is connected to the remaining unconnected side of the crystal. C3 is bridged across the phone connections at the most convenient place.

A TIP ON AF CONNECTIONS

WHEN connecting up two stages of transformer-coupled audio-frequency amplification, connect the F posts of the transformers to the A battery post, not to the output of the rheostat. This may be done by connection to the battery side of the rheostat, not to the socket side.

Completing the Low-Loss Neutrodyne

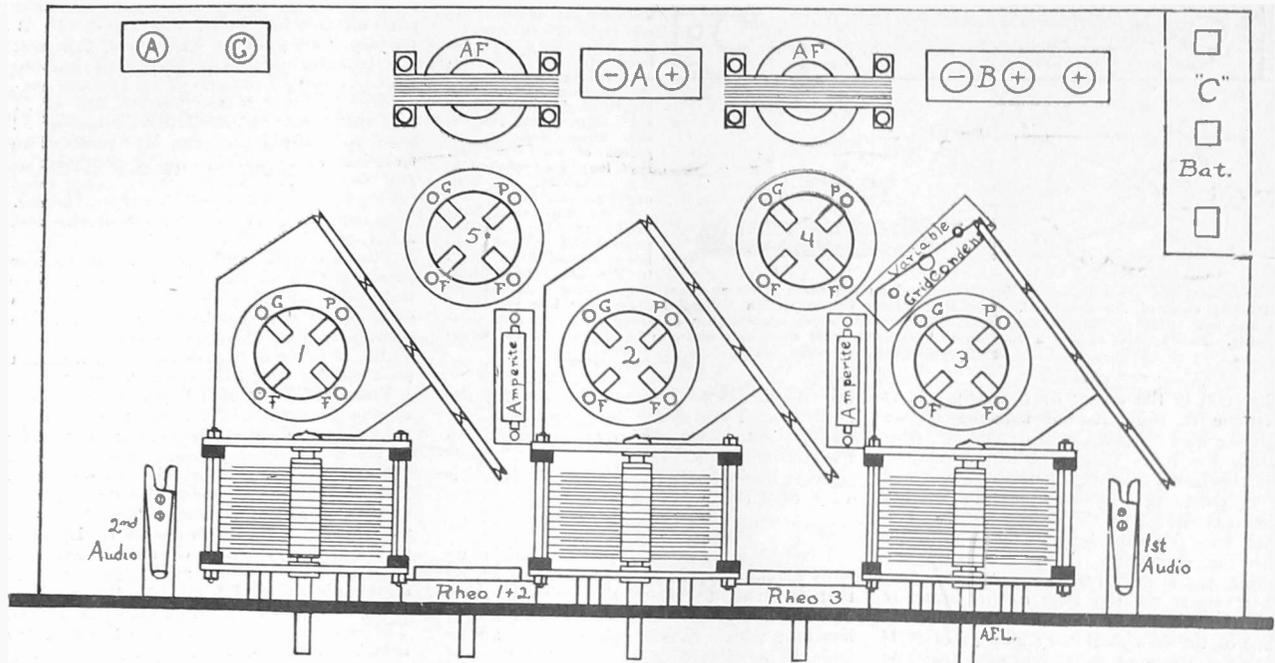


FIG 5, assembly layout, top view, of Magnadyne. The neutralizing condensers are not shown in this diagram as they are supposed to be hidden underneath the variable condensers and anyway their position is optional. No binding posts are provided for the C battery, as the battery is already provided with clips. The cabinet for this set is 7" x 21" x 12" inside diameter.

PART II

THE construction of the Dynocoils, which are the only coils to be wound in this set, is simple, yet due care must be taken to get the windings right. Fig. 3 is the winding form and is reproduced in actual size. The original Dynocoils were wound on celluloid forms, then dipped in a solvent, made of ether or amylacetate. Another method was devised, employing cardboard forms which are withdrawn after the windings are complete.

Fig. 3 should be used as a template in cutting the cardboard forms. In order not to destroy the page, trace the lines of the illustration onto three sheets of tissue paper, paste these on three squares of the heaviest cardboard you can procure and cut on the lines.

All three coils are wound the same, with the same number of turns of wire, except that one of them (the first Dynocoil) is untapped. You will need almost a pound of No. 24 double silk covered wire, so it is best to buy that much in one length. Measure off about 11 feet of wire, double the wire at that point, and twist the end into a small loop so that it will not come apart. You now have the eleven feet of wire lying loose, a loop at the bending point, and the rest of the wire on the spool. Start winding at S 1 (Fig. 3), in a clockwise direction. At the 15th turn disengage the loose end of the primary and coil it down out of the way. Continue winding with the wire from the spool until the 36th turn is reached, where you again make a few twists in the wire, forming a small loop. Wind 18 more turns of wire and you will have a total of 54 turns for the secondary and 15 for the primary with a tap for the neutralizing condenser at the 36th turn. Don't forget the tap is made only on two of the coils.

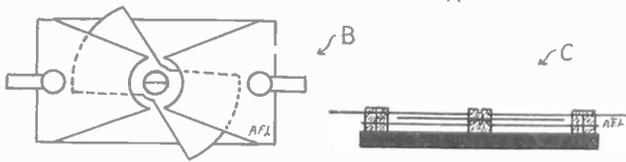
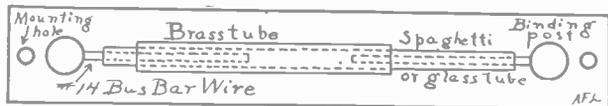
Fig. 3 shows the marks S 1, P 1, S 2, and P 2. The winding was started at S 1, designating the beginning of the secondary. Cut the loop of wire which you made at the start of the winding, leaving an inch or two loose for connecting. You must now find out

which end is the beginning of the primary, or P 1. To find this connect a small battery and head phones in series with the loose end of the primary (at the 15th turn) and test with each end of the wire at the beginning of the winding. The one that gives a loud click is P 1 and should be fastened at that point shown on Fig. 3. The other end of the primary is brought down to where P 2 is and fastened there. A half hitch at S 2 will keep that end in place. The tap, not shown, is scraped clear of insulation and a drop of solder applied to keep it from becoming loose.

It was mentioned before that the forms for the coil were to be withdrawn after the windings were complete. This is done by carefully cutting away each spoke from the center and pulling the spokes out. As the novice may have some trouble in properly tying up the windings with thread it may be preferable to take out only four spokes. This is entirely optional with the builder, who, if he feels that he does not care to take the chance of spoiling the coil, may leave all the spokes in. A facile way of making a coil low-loss yet rigid is explained in the article on the Single-Dial Set in this issue. The reason for low-loss is that only one form is used for both windings, whereas the custom has been to use two forms, one for the primary and one for the secondary. The inductance value is also very high, due to the extremely close proximity of primary and secondary. By the way, in winding the coils, both wires are held parallel for the 15 turns. This is the reason for the slightly larger form used.

Fig. 4 shows two types of neutralizing condensers from which the builder may take his choice. Both do the same work and are easily adjusted. Fig. 4A is the well-known type of bus bar neutralizer. The parts required are: a strip of bakelite or radion 5" x 3/4" x 3/16"; two binding posts with openings for No. 14 round or square bus bar wire; about a foot of that wire; about a foot of good quality spaghetti; two 3" lengths of brass tubing (any radio shop sells it) and a few lugs. Drill holes for the binding posts 1/2" from

How to Wire Magnadyne Circuit



the spaghetti and the solid black lines continued on the same plane as those protruding ends of the spaghetti. The dotted lines drawn within the solid protruding line represent the bus bar. Fig. 4-B is the top view of a butterfly type neutralizing condenser. C is a side view of same. This type is simply a very small 5-plate variable condenser and can be either made at home or purchased at a radio store.

either end in the center of the strip. It is advisable to use flat-head machine screws with the binding posts, and of course countersink the holes underneath to accommodate the heads. There should be about $\frac{5}{8}$ " to $\frac{3}{4}$ " distance between the ends of the wires (as shown by the dotted lines). The brass tube should slide easily but firmly over the insulating tubing. Provide the binding posts with lugs.

Fig. 4B is the top view of the butterfly type of neutralizing condenser, showing the shape of the four stationary plates. In reality this is a 5-plate variable condenser. The plates may be cut from a sheet of thin aluminum with a sharp pair of shears. The stationary plates are 1" wide by $\frac{3}{4}$ " long. The mounting holes are drilled near the edges, as shown. The movable plate, $\frac{3}{4}$ " wide by $1\frac{1}{4}$ " long, is cut in one piece and a hole drilled in the center. The parts needed beside the plates are two blocks of bakelite or radion, 2" x 1" x $\frac{3}{16}$ "; six flat-head machine screws; 20 nuts to fit the screws, and a few thin metal washers. To drill the holes, draw a line across the middle of the blocks and drill at the edges and through the exact center. Countersink all holes deeply. The end screws are placed head down and the center screw with the head at the top as shown. Fig. 4C (side view) fully explains the mounting of the plates. The washers are used on top of the nut on the center screw to lift the movable plate clear of the stationary plates. This plate must swing between the others without touching.

Assembly

In assembling the various parts follow Fig. 5, which is the front top view. The neutralizing condensers are omitted in the drawing as they would appear underneath the variable condensers. There are many types and styles of binding posts and the builder may have some pet of his own. Therefore I will not endeavor to designate any. However, experience has taught that Fahnestock clips screwed right to the baseboard, or mounted on small insulating slips, are perhaps preferable to others. The input and A and B battery posts are individually placed and should be plainly marked to save yourself regrets if you should ever by chance place the right wire onto the wrong post. The C battery (large size $4\frac{1}{2}$ volts) is provided with three Fahnestock clips, thus saving that much time and trouble.

Before screwing down the sockets or transformers to the base, mount the condensers, rheostats, jacks and switch onto the panel. Fasten them on real tight, as they have a tendency to become loose. Place the panel up against the baseboard and mark with a pencil the relative position of the sockets, neutralizing condensers and fixed filament resistances. As before mentioned, the neutralizers are to be mounted on the baseboard underneath the variable condensers. It may be more convenient to place them between the condensers, although

this might crowd things a bit around the rheostats. Two screws are sufficient for each socket. Use your own judgment on the transformers. Use nothing but brass screws throughout. The assembly part is very easy and will not take long.

Wiring

I have always maintained, and back it up with actual experience, that flexible wiring that is straight and to the point is more efficient and easier to install than the stiff bus bar, which runs at all sorts of angles and has a habit of getting in the way of the next piece of work. The ideal way to work with flexible connections is to measure off the necessary length of wire and solder a small copper lug to each end. Where a wire must be tapped, scrape the insulation off and when the tap has been made and soldered, drop a bit of melted sealing wax on it for insulation. Bunch all the A battery leads and minus B battery leads and run them in cable fashion to their designations. It does not matter if these leads are a trifle longer, although you will find that over-all they will be considerably shorter than bus bar leads, because almost all the angles are eliminated.

The usual precautions against long grid and plate leads are to be strictly observed. You are permitted to run these leads straight from coil or condenser to grid or plate with no angle. Where a lead turns a corner just make it a little longer to form a long curve. As all these leads are already insulated you need no spaghetti. I have found that No. 18 silk covered fixture wire (stranded) is the most convenient to handle and is amply large enough. Bus bar is used only for the supports for the Dynocoils. The diagram (Fig. 5) explains that bending of the bus bar better than words. These supports are strong enough to hold the coils up firmly and are soldered on after all the other wiring is complete. There is plenty of room to insert the tubes between the wires and plenty of room to reach under the condensers with a long pencil (rubber end first) to adjust the neutralizers.

Referring back to Fig. 1, part 1 (page 3, RADIO WORLD, August 16), the wiring is as follows:

The plus A and minus B posts are connected together. The minus A lead goes to plus C battery and to one side of the filament switch. From the other side of this switch it goes to the minus A post of the first and second tubes, to one end of the detector rheostat and to the minus A posts on the two AF tubes. The other side of the detector rheostat goes to the minus filament post of that tube. The A plus lead goes to one side of the rheostat R1, to the plus filament post on the detector tube, to one side of fixed resistance R4 and to the top leaf of the last jack (J2). The other side of R1 goes to the positive F posts of the two RF tubes. The other side of R4 goes to the plus filament post of the first AF tube, and the second

leaf of J2 goes to one side of R5, the other side of which goes to the plus filament post on the last tube. The 221-2-volt B battery lead goes to post F on the first AF transformer. The 90-volt B battery lead goes to the outside of L3 and the outside of L5, also to the bottom leaf of J1 and the frame of J2. The first leaf of J2 goes to the plate of the last tube. The first leaf of J1 goes to the B plus post of the second AF transformer. The third (J1) goes to post P of that transformer. The top leaf goes to the plate of the first AF tube.

The antenna and ground go to the primary (L) of the first Dynocoil. The inside end of L2 goes to the rotor plates of C and to the grid of the first tube. The outside end of L2 goes to the stationary plates of C and to the negative filament post on the first tube.

The inside end of L3 goes to the plate of the first tube. The inside end of L5 goes to the plate of the second tube. The inside of L4 goes to the rotor plates of C2 and to the grid of the second tube. The outside of L4 goes to the stator plates of C2 and to the negative filament post of the second tube. The inside of L6 goes to the rotor plates of C3 and to one side of C4. The outside of L6 goes to the stator plates of C3 and to the positive filament lead of the third (detector) tube. The other side of C4 goes to the detector tube grid. The plate of this tube goes to post P on the first AF transformer. The F posts of both AF transformers are connected together and a lead brought out to the minus C battery post. The plate of the first AF tube goes to the top (fourth) leaf of J1. The second leaf of J1 goes to the B plus post of the second AF transformer, and the third leaf to post P of that transformer.

Solder a lead to the taps on L4 and L6 and connect one end each to the neutralizing condensers N. The rotor plates of C go to the other side of the first N and the rotor plates of C2 go to the other side of the second N, counting from right to left. Connect the C battery into the circuit permanently, as it will last at least four months. The set is now completely wired and ready for operation. As before mentioned you may compare results with and without the grid leak R2.

Neutralization and Operation

It has been said that the circuit only needs neutralizing for the lower wavelengths. This is quite simple to accomplish, the neutralization being gone about in much the usual manner, except that certain stations are selected for testing. It is best to pick out a station operating between 250 and 320 meters to listen to while adjusting. As every locality has its low-wave station, I will leave the selection to the reader. You may go down as low as 224 meters in adjusting if no other station is handy.

To neutralize, listen in on a station and tune it in as best you may. Take out the first RF tube and place a piece of paper on one of the filament prongs of the socket, then replacing the tube. It will not light now. The signals will be weaker, but loud enough to adjust by. Retune the dials until the signal is strongest. Now vary the first neutralizing condenser by moving the plate of the butterfly condenser in or out, or sliding the brass rod back and forth slowly, as the case may be, and stop when the signal is faintest or not heard at all. Take the piece of paper out of the first socket and place it in a similar position in the second RF socket, replacing the tubes as before. Exactly the same procedure is followed in neutralizing the second tube. It will be found that all stations above this low wave will be picked up without the slightest bit of oscillation, and very rarely indeed will there be any oscillation on even the extremely low waves. Once adjusted, fix the

Template for All Neutrodyne Coils

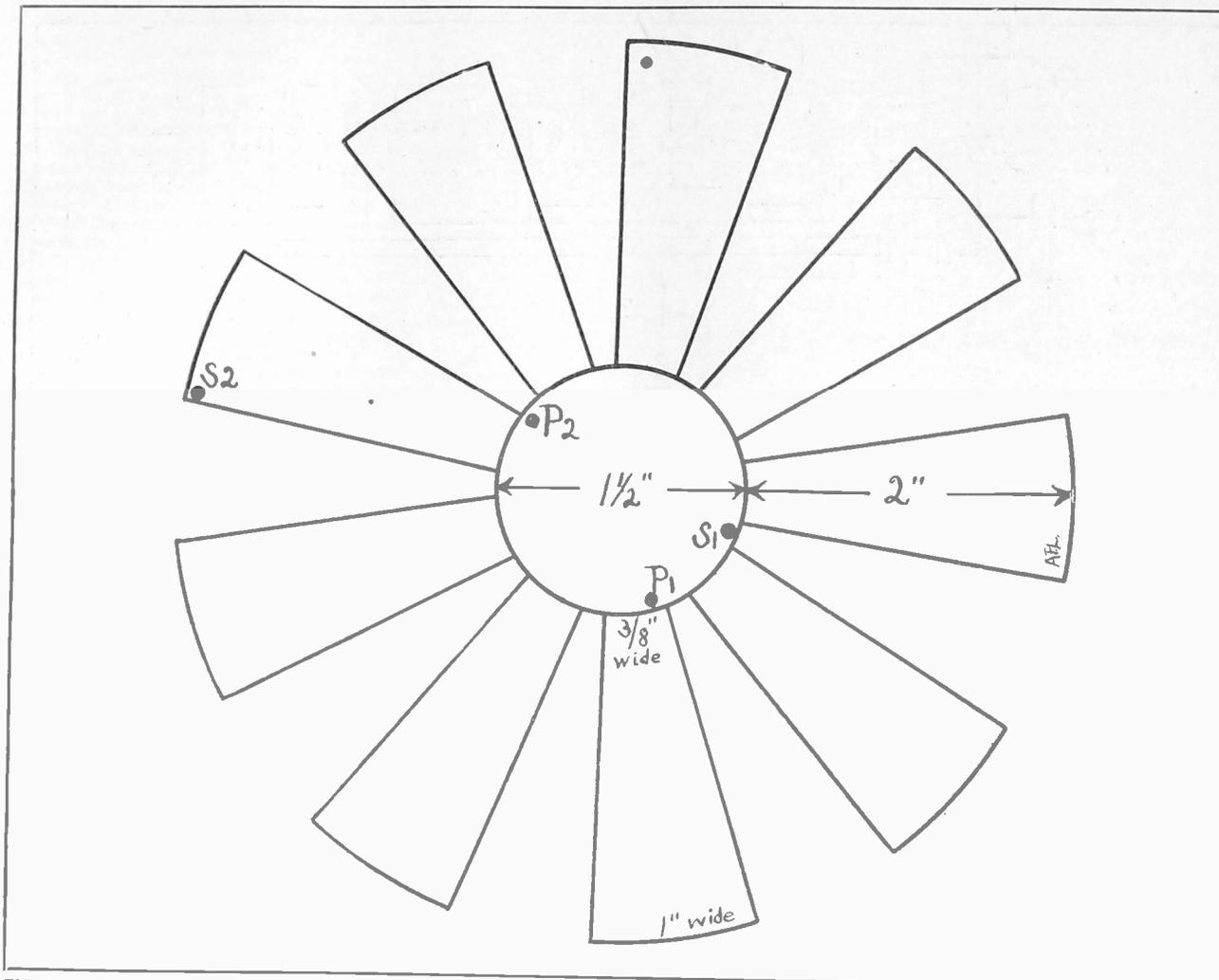


FIG. 3. template for the Dynocoil form. Trace the lines onto three sheets of tracing paper, paste these on three squares of heavy cardboard and cut out. The black dots designate the points to which the different terminals are brought. After the windings are completed, the coils are bound with thread and the form extracted thereby, forming a low-loss coil. The template is exact size.

position of the neutralizing condensers by dropping a bit of sealing wax on the edge of the brass tubing on the bus bar type, or by screwing down tight on the movable plate on the butterfly type. Of course, commercial neutralizing condensers may be used instead of home-made ones.

A word as to the A, B and C batteries. Using 201A tubes, the drain on the storage A battery is nearly 1.5 amperes at six volts. Figuring on an average use of 3 hours every day, a 100-ampere hour battery will last about three weeks, but this means letting the battery run almost all the way down, which is bad practice. Therefore, it is advisable to use a 120-ampere-hour battery for three weeks' service before recharging is necessary.

The B battery is important. A number of fans possess storage B batteries, which are fine if kept in proper condition. The great majority, however, rely on dry-cell batteries for their high potential. The Eveready people have just placed a new heavy duty battery on the market which is just right for this type of set. The C battery should be large size 4 1/2 volts.

The operation is along the same lines as any other 5-tube tuned radio-frequency set, with the exception that a little adjustment of the radio-frequency rheostat is likely to bring in that station on the loud speaker that you could hardly hear before on the earphones. The antenna should be about 100 feet long and fairly high up, and a good ground is of course essential. Having followed all the instructions and direc-

tions, you will be more than satisfied with the splendid results obtained. Great distance brought in clearly on the loud speaker with excellent quality. What more can you ask?

LIST OF PARTS

- One 7x21x3/16 inch panel.
- One 5/8x20x11x5/8 inch baseboard.
- Three 4 inch dials.
- One double-circuit jack.
- One single-circuit filament control jack.
- Two 30-ohm rheostats.
- One battery switch
- Two fixed filament resistances for 201A tubes.
- Three 23-plate low-loss condensers.
- Five tube sockets.
- One grid leak and Amplex Grid-denser.
- Two 4 1/2 or 5-to-1 ratio audio-frequency transformers.
- One 4 1/2-volt C battery.
- Two neutralizing condensers.
- Three Dynocoil RF transformers (home-made).
- One 21x7x12 inch inside diameter cabinet.
- Binding posts, hardware, connection wire, etc.
- B battery, 90 volts.
- One 6-volt storage battery.
- Five 201A type tubes.

When first placing the set in operation try the following stunt, which may obviate the necessity of adjusting the neutralizing condensers. Tune in on some low-wave stations, getting all three dials in resonance.

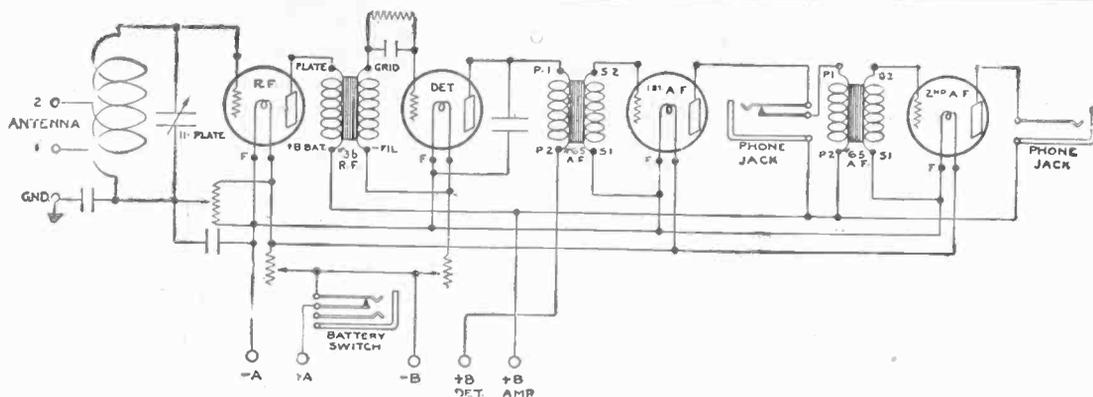
Should you hear a click, whistle or mushy sound turn down on the radio-frequency control rheostat until the noise stops. If the signal is of satisfactory volume now and there is no oscillation present there is no need to bother with the neutralizers. This stunt is next to impossible to accomplish on other sets because others employ one rheostat to control both the radio and audio-frequency tubes. In the latter case the above effect could not be accomplished because if the rheostat is turned down the current in the audio-frequency tubes would be diminished to such an extent that very little amplification would result. It may even be advisable to take a chance on leaving the neutralizers out and to test the circuit to find out if the radio-frequency oscillation can be controlled by the above method.

[This concludes the two-part article on the Magnadyne, the Low-Loss Superdyne, by N. N. Bernstein. Part I was published in last week's issue, August 16.]

RADIO REPLACES MINISTER STOCKHOLM.

A RADIO loud speaker has taken the place of a minister for the first time in Sweden on the Island of Utoe, in the Stockholm Archipelago. The congregation, after having taken part in the service broadcast from Stockholm, was enthusiastic in praises of the new scheme, since the island, especially in the Winter time, often cannot be reached by ministers, owing to bad navigation conditions.

Set Works Without Aerial or Ground



WIRING DIAGRAM (Fig. 2) of a four-tube circuit which utilizes one stage of radio-frequency, detector, and two stages of straight audio-frequency amplification. The tuning is very simple. Points 1 and 2 on the antenna tuning coil are optional, depending on the length of the receiving antenna. The value of the fixed condenser from the rotor of the variable condenser and low voltage side of the inductance to the minus filament is .005 mfd. and acts as a by-pass for the radio-frequency currents present. The condenser in series with the ground and bottom of the tuning inductance has a capacity of .005 mfd., which allows the passage of signals and prevents the possibility of burnouts. The first, third and fourth tubes are controlled by one rheostat, while the detector is controlled separately. Under ordinary conditions, very good DX results will be obtained with the use of a small outdoor antenna and ground, although good signals are heard without either.

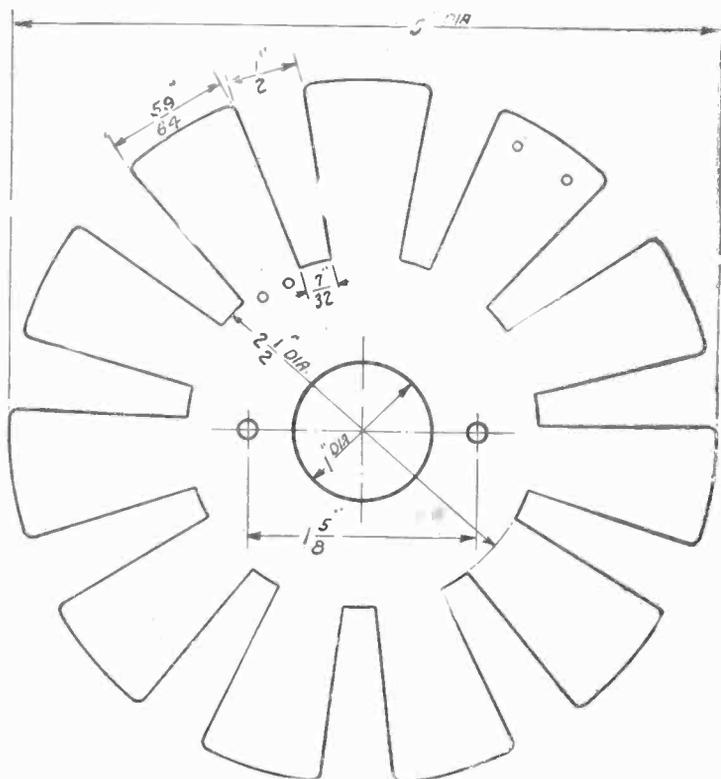


FIG. 1—Schematic layout of the antenna tuning inductance, giving cutting dimensions. Starting at the inside, wind three turns of No. 24 DSC wire and make a small loop for a tap. Continuing, wind seven more turns in the same direction and make another loop for the second tap. Without breaking the wire, wind 43 more turns of wire and terminate. The total will be 55 turns of wire, or about sixty feet. The spider-web form is 5 inches in diameter and 1/8 inch thick. See page 6 for actual size template.

By Weldon Warren

HERE is a standard non-regenerative circuit employing a radio-frequency transformer ahead of the detector. The circuit is best adapted for use of the UV199 or C299 tubes.

As for a radio-frequency transformer, one was sought that would not only produce a good signal intensity over the broadcasting waveband of 220 to 550 meters, but would also block, if possible, parasitic noises often encountered, as

produced by leaking electric power lines, etc. Lawrence C. F. Horle, Chief Engineer of the Federal Telephone & Telegraph Company of Buffalo, N. Y., suggested I use their type No. 36 RF transformer, designed especially for No. 199 or 299 type of tube.

For compactness the tuning device selected was an auto-transformer, with two primary inductance values and with secondary coupling ratios varying from 1 to 5 to 1 to 17. This not only permits of the primary remaining untuned (yet variable), but gives selectivity, which is much de-

sired. To wind this tuning inductance, a well-insulated form should be used (Fig. 1). Sixty feet of No. 24 double silk or single cotton covered wire will be required for the winding, which is continuous from the starting point at the inner circle or bottom of the slots. Wind first over, then under each arm of the form until a total of 53 turns has been wound on the form. Counting from the starting winding a tap should be taken at the third turn, also one at the tenth. The most convenient method is to take these taps off when winding the coil by forming a loop at the third turn, continuing on without cutting the wire to the tenth. Then the second loop should be formed. Continue on to the last or fifty-third turn. Note in particular that taps 3 and 10 are for antenna connection, these taps being provided so that more or less turns of the primary may be connected to the antenna for selectivity.

Twenty-two to forty volts of B battery may be used on the detector, while sixty volts on the audio amplifiers will provide sufficient volume. Three standard No. 6 dry cells connected in a series provide the proper filament current as an A battery.

Place the radio-frequency transformer and detector sockets at the inside with an audio-frequency socket at either end. This does not require additional room, yet permits wider spacing of the audio transformers.

Two peculiarities exist in the wiring diagram. First there is the use of fixed condensers. The value of the fixed condenser connected from the plate of the detector to the minus A battery is .001 mfd., its purpose being to shunt not only the primary of the first audio-frequency transformer, but also the A and B batteries, and thus provide a low resistance alternating current by-pass for the radio-frequency component. The value of the fixed condenser from the rotor of the variable condenser and low voltage side of the inductance to the minus filament is .005 mfd. and is a further by-pass for the radio-frequency. The fixed condenser from the low potential end of the inductance to ground is .005 mfd., shunting so as to safeguard against burn-outs.

The second peculiarity is in my having taken advantage of the opportunity to control not only the radio-frequency tube, but also the two audio frequency tubes

(Concluded on page 24)

A Low-Loss Superdyne Circuit

By N. N. Bernstein

Technical Editor.

Construction Designs by A. F. Lapierre

PART I

THAT the Superdyne is holding its own against all other types of receivers is demonstrated by the great number of queries regarding the circuit and its operation and by the many laudatory letters received. In my previous articles on the Superdyne I have dealt with the familiar type of coils and amplifiers, which has met with great success.

In this two-part article I will describe the construction of low-loss coils and a 3-stage resistance-coupled audio-frequency amplification circuit that surpasses in results the fondest expectations of the myriad of radio enthusiasts who delight in volume combined with the utmost in clarity and tonal quality. Of course, the use of the third stage of audio-frequency amplification brings the total number of tubes up to five, but the man who wants that long distance station to come in clear and loud will not be deterred by the cost of the fifth tube. Besides, tubes have gone down in price, now \$4.00 retail, list price.

The Superdyne, already famous for its exceptional reception quality, will be still further enhanced by the distortionless amplification method to be described. The third stage of AF amplification in this case will cause no disturbing howl or have any effect on the signal other than to increase its volume on the straight line current basis.

First comes the construction of the coils. The plate coil is wound spider-web fashion and consists of 46 turns of No. 20 double cotton covered wire with a tap at the 20th turn. This plate coil is wound COUNTER-CLOCKWISE in the following manner: Holding the form in the left hand, with the form facing fully toward you, wind the wire over one spoke and under the next in the direction opposite to that in which the hands of the clock move, that is, wind from right to left. At the twentieth turn make a small loop which is the tap. Continue winding until 46 turns are on and make a half hitch to hold the end of the wire, leaving a foot or so loose for connection. That is, you turn the wire terminal once around a spoke, with a foot of wire left free.

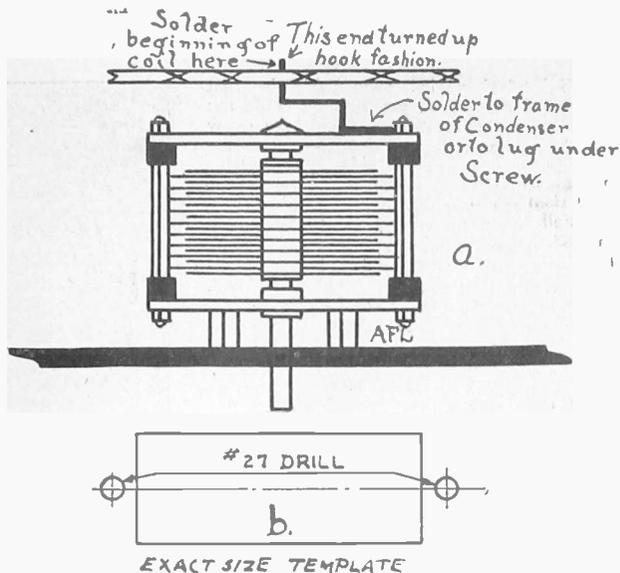
The spiderweb form used for the winding is of the usual size, $4\frac{1}{2}$ " in diameter. On page 6 of this issue there is published a diagram in full size of a spiderweb form which you may use for a template in making the plate coil. The article referred to also describes the manner in which to bind the windings with cord or thread to make the coil self-supporting, after which the form is cut off and withdrawn, thus reducing the insulation losses to next to nothing. However the method of winding to be followed is the one I describe.

When making the loop for the tap at the 20th turn scrape the wire for about an inch and twist the bare part together, so that you can apply the soldering iron later without having to untwist the wires to dispose of the insulation.

The plate coil having been made self-supporting, it is left without means of mounting it, but that is taken care of by an efficient method of mounting it direct to the grounded rotor plates of the low-loss condenser. To accomplish this prepare a length of No. 14 hard drawn bus bar wire as follows

Measure off two lengths, about 8" each, lay them parallel and close together and solder them firmly along the entire length, at intervals of about $\frac{3}{4}$ ", making six soldered

FIG. 1-A shows how to mount the spider-web plate coil. The doubled bus bar is bent in the shape shown and soldered firmly to the rotor plate connection on the variable condenser. In this position the plate coil will be at right angles to the capacitor. Fig. 2 shows the template for drilling the holes to accommodate the cam switch. Full directions for cutting the square hole are given in the text. The template is exact size. Two such holes are to be made in the panel. The circuit diagram for the Low-Loss Superdyne is published on the front cover. It shows the wiring of the RF stage, detector and three stages of resistance-coupled audio-frequency amplification, five tubes in all. The Superdyne is one of the most popular circuits of the day and is increasing in favor, due to its fine quality of received signal. This is accomplished by feeding back the plate current in a reverse direction to control oscillations. The set is a DX-getter, too. N. N. Bernstein, the author, is an authority on the Superdyne.



places. This will form one solid piece of wire of double strength for the support. Bend the wire as shown in Fig. 2A and cut it, figuring on hanging the coil about $\frac{1}{2}$ " back of the condenser as shown. This support will easily hold up the plate coil rigidly and it disposes entirely of the necessity of any other means of support employing insulating material and metal screws.

Fig. 2B is the drawing in actual size of the holes to be cut in the panel for mounting the two 4-pole double-throw anti-capacity switches. The type I used is the Federal 1424-W. The holes are made as follows: Fasten the template securely to the panel in the proper position with a few drops of paste. With a sharp punch make holes through the template into the panel at the points indicated by the cross in the circles, and at the corners of the oblong where the lines meet. Remove the template and drill through the panel with a No. 27 drill. Next draw lines from each of the four corner holes on the panel outlining the oblong.

With a small drill outline the oblong with holes drilled just inside of the lines. Punch out the center and with a file smooth the edges down to the lines. All this takes but 10 or 15 minutes. The task of installing these panel switches is well worth the extra time it takes, for with them a great deal is added to the convenience of operating the set. One switch is used to change the coils from the lower to the higher waves, and the other serves to increase and decrease the output of the amplifiers to the loud speaker.

Two jacks are used, one a double-circuit jack placed after the detector tubes and the other a single-circuit jack placed after the last tube. The head phones are plugged in on the detector jack for tuning purposes while all the tubes are used when in on the amplifier jack.

[Part II, the concluding installment of N. N. Bernstein's article on "A Low-Loss Superdyne," will be published next week, issue of August 30, on sale August 27.]

The Insatiable Longing of the Oriental Heart; Or, Where Is the Hon. DX Yet?

Hon. Editor, RADIO WORLD.

Efficiency Sir: It is my gratification to get long distance, Viz Dz, you have it, on my most elegant radio set. But I ask you with profound respectableness and hoping how you will tell me great truth—why can I get Japan none at all? Japan a honorable country and perhaps, I don't know, has so great Broadcasters like your own Hon. Westinghouse and WEAF. But I listen first with good right ear, then equal-like with left ear, but no Japan come sailing thro the fine American air. Perhaps you say to me: "Tammayato (so my Hon. father leave me with name but no riches) we do not know all the time why you get not your Japan, but perhaps it (we say so with much regrets) be because your coun-

try have no Broadcasting station like splendid WJZ or WPI, which lastest one is in a very cut-price retailery." So perhaps you communicate me, so perhaps not also.

Tell me, Hon. Ed., why I hear not my Japan, which aforesaid and second time, is most honor. country. I have no desirables to offshoot the entente cordiale (most richly French) existence between our disrespective countries, (see Hon. State Department. Mem. writ wisely by excellency Charley Hugs) But I want know why if perhaps you can't or maybe tell me so.

Your truly friend and reeder,

AYENO TAMMAYATO, Per H.

Not so far Nob Hill.
San Francisco, Calif.

The Adventures of An Obliging Home Constructor—By Charles J. Ridwell

THE telephone bell rang. A voice that was familiar and yet which I could not place for the moment—for it had been many months since I had heard it—asked for Charlie. "That's me," said I, forgetting my grammar as I switched off the radio. And then my telephone caller started in:

"Well, well, Charlie, I haven't seen you in such a long time. Let me see. It must be five or six months. How are you feeling? Same old peppy individual, eh? Well, that's good. And business, I hope, is fine. Well, well, you always were a wonder, Charlie. And how is Alice (my wife) getting along? Splendidly? Well, well! That's great. You know, Marie (his wife) often talks about her, saying what a fine woman she is, and what a lucky dog you were to get such a splendid wife. You know, Marie must be pardoned her own little way of putting it. She knew you years and years before I did—eh, Charlie? Once upon a time it was nearly Marie instead of Alice for you, eh? Well, that's how it goes with the handsome boys."

By this time, as you can well imagine, I knew that I was being bombarded by Eddie R—. He continued in the foregoing strain—and I use the word "strain" advisedly—for about half an hour, so it seemed to me. Then said he:

"You know, Charlie, old man, things are just beginning to move along nicely with me; business is picking up and all that, but I haven't any great fortune to spare. Now I decided—or, rather, Marie decided for me—that we must have a radio, and knowing that you are some pumpkins as a radio engineer, she suggested I phone you, and here I am. What sort of a set would you advise me to get?"

And from there on it became increasingly apparent that what Eddie wanted me to do was to build a set for him. And I promised I would. And I did. He was too busy to come over to my house even to look at it. Alice intimated it would be doing only the right thing for me to take it over in my car, as Eddie had no car. I did that. I even installed the set. Eddie wrote me two letters and phoned me several times about the great results he was getting. Comparing his statement with my own log, I saw that he was doing even better than I was on my own set, which is the same kind as his. I attributed that to his more favorable location. But Eddie has never been sufficiently delighted to pay one cent. Evidently he thinks the set is a gift, but if so it is the most unwilling donation I ever was compelled to make.

I have had three experiences like that and one other in which a doting acquaintance paid me nearly half of what the parts cost. But I hesitate to turn any one down, lest some deserving friend, and one whose friendship I value, feel that I am offensively unobliging. It is one of the sad facts of this life that the shortcomings of some persons rebound against other and deserving individuals. So at least I decided that I would never build a set or anybody unless the cost of the parts was paid in full in advance. Preferably I would have the prospective set owner buy the parts himself, or be present when they are bought, lest I be suspected of making some secret profit! I think it is the better part of wisdom to do this. But, as with all rules, there are exceptions, and I find myself occasionally doing just the opposite. Recently, however, perhaps because of greater caution and sounder analysis of the individual, I have not been stuck for a cent. One night I



(Photonews)

ONE OF THE STRANGE FACTS about radio is that many persons rated as "stone deaf," and who can not hear speech or music under ordinary conditions, can hear radiocast sound quite well. This is said to be due to the extreme concentration of the sound vibrations from the earphone diaphragms. Photo shows Harry Dufony, Jersey City, N. J., who can hear even better by unscrewing the phone caps and touching the diaphragms with his fingers. He enjoys such reception enormously.

got an unexpected telephone call from another person who also wanted a set built—this one for his son, whose birthday was two days off. The idea, of course, was to give sonny a birthday surprise, and I was elected to bear the brunt of the burden. This I did willingly. I devoted eight hours to making the set. I stole up to the roof, erected the aerial, returned home, smuggled the set into my friend's house, got the set working, tuned in Chicago—some 800 miles away—and had the loud speaker wake up sonny, who, I suspect, had been sleeping with one eye open, as is the custom with boys on their birthday.

About a week later my friend telephoned me that the set wasn't working well and would I please come out for supper, as his wife had been reprimanding him on his deficiency in hospitality. I came, I saw, I fixed. There was nothing at all the matter with the set. One of the blocks in the B battery had gone dead, and simply by cutting it out of the circuit everything went along as formerly.

A day passed, then another day. Two solid days of joyous respite! But—the telephone bell again. Something wrong with the set! This time an inspection again showed B battery trouble. The set had been kept going almost continuously during waking hours. Friend wife kept it on all day, and if she showed any tendency toward weakening, sonny, when he came home from school, added his moral support. And at night daddy was right on the job, for he had developed into as avid a DX hound as is bred in any radio kennel. Hence the detector B battery had been used up. I so informed the three of them. The downcast faces that confronted me made me feel decidedly guilty—although of what I can not

now say. My friend politely enough inquired as to the normal life of a B battery. His wife said—rather darkly—that when the battery had been brought to the house (by myself, you will remember) it had looked new and fresh enough! And did I try out all B batteries before letting them be installed in peoples' houses? Did I have one at home that I was sure would keep on functioning, so that the cost of upkeep would not be so tremendously high? I knew it would have been impertinent of me to have asked whether I should lay out the money for the new B battery and expect to be paid for it ultimately—just as I was still expecting to be paid for the whole set—ultimately. Since then I have given up all hope of collecting a cent and whatever I do get will be strictly regarded by me as found money. However, the total amount due, I may add, was not swelled by the price of an extra B battery. If ever my friend bought one he must have paid for it himself, hard as it is to believe, or probably he got somebody else to pay for it. Maybe he borrowed one and promised to return it when it was used up. Such a promise he would not feel obliged to ignore.

I do not mean to suggest I have become soured on the world because of my experience in set building. Indeed, I write of these things mainly because I desire to save others from being victimized and to point out how advisable it is to exercise strict caution in outlay for persons whose desire for a set includes no eagerness to pay for it. There is a lot of this polite swindling going on.

The other side of the picture is refreshing. All told, I have built perhaps twenty-five sets for others. Most of those whom I obliged are delighted, are frank enough to say so and are glad to inform me when they accomplish something they think is remarkable. One friend telephoned me last February that he got home at 3 a. m. from the club and decided to see how far he could reach with the set. He reported having heard KGO from his apartment house on Riverside Drive, New York City. He just bubbled over with enthusiasm. He is probably still telling his friends of the wonderful achievement in getting excellent reception from coast to coast. Of course, no mean part of that noteworthy accomplishment was due to his own expertness in tuning!

It is indeed a pleasure to have introduced many persons to radio, or to have seen them properly on their way, once the radio idea hit them. All agree that there is nothing to compare with radio. And I agree with them, of course. But I must admit that I am now strongly advising the world that the easiest and best solution is to buy a commercial set—unless they want to build a set themselves. I would have to resign from the directorate of the bank in which I am most deeply interested, forego my tennis, deny myself even a dip in the ocean, put my car and motor boat in storage and divorce my wife were I to permit my radio repair business—a complimentary side line that develops with the fecundity of the guinea pig—to enjoy normal growth. Anybody who has built more than one set for other folk must know that the construction is the minor part of the job. Being Godfather to the set is the big task.

NEXT WEEK—How to Build the Ultradyne, great DX Set

Inside Secrets of Radiocasting Studio



(International Newsreel)

THE AUTHOR IN HIS ELEMENT—Kolin Hager, chief announcer of Station WGY, Schenectady, N. Y., is shown with the other announcers of that station. Mr. Hager is the author of the accompanying article on secrets of the studio. Left to right, Asa O. Coggeshall, Carl Jester (director, WGY Light Opera Company), Mr. Hager, Robert Weidaw, Edward H. Smith, director, WGY Players, and William Fay.

By Kolin Hager

Chief Announcer, Station WGY, General Electric Co., Schenectady, N. Y.

I MADE my first announcement on the night of February 21, 1922, with many misgivings. I had rehearsed just what I was going to say, twenty-five or thirty times, and then, when the time for the announcement arrived I said something altogether different from that which I had intended.

* * *

The WGY studio is a comfortably furnished suite of rooms on the first floor of a new office building. The room from which come the songs and selections, the speeches and the readings, the comedies and dramas, is furnished with nothing in the way of scenery such as is found in theatres, yet it was only a few days ago that the studio officials received a call from a traveling scenic artist, who had been told that he might land a job at WGY, painting scenery for the radio.

* * *

One day the phone rang rather vigorously. I answered it and received this message: "My husband came home sober, thank goodness, and I wish you would broadcast the fact."

* * *

Not so long ago the WGY players, a dramatic organization built up for the broadcasting of plays, delivered the comedy, "Get Rich Quick Wallingford." The story of the play has to do with the exploiting of an invention for "carpet covered carpet tacks." Not long after the play was broadcast the studio received a visit from a woman who appeared very much excited. "You have exposed my secret," she said. "I have been working on this tack proposition for years and just as I get it perfected I hear you broadcasting the secret to the world."

* * *

Absolute silence in the studio is most essential and it is difficult to impress this on the artists or speakers who may be on the program.

This silence must be maintained after the song or speech has been finished until the power has been cut off. But very often a vocalist will turn about, immediately after finishing a song, and while standing in front of the microphone say:

"Did I sing that all right?"

High upon the wall, in plain view of anyone who happens to be in the studio

Antenna Arrangement of New Kind Uses an Extra Counterpoise

Hartford, Conn.

ADRIANO DUCATI, in Italy, has communicated very successfully with amateurs in this country with a new antenna arrangement, according to a communication received by the American Radio Relay League.

Mr. Ducati increases the capacity between his antenna and counterpoise with an extra counterpoise erected above the regular antenna system.

He is easily the foremost amateur in Italy, as he was the first to establish two-way connection with this country.

The technical department of the A. R. R. L. is interested in the use of an additional counterpoise over the antenna and experiments will be made shortly to determine its special advantages.

are two lights, one green and the other red. The green light indicates power on the antenna while the red light indicates that the microphone is open for broadcasting.

* * *

The microphones do not come into view at the first survey of the studio. The first thought of the uninitiated person, upon stepping into the studio, is that a considerable number of floor lamps are used. Several of them with small ornate silk shades are located in various sections of the room. Closer inspection, however, discloses the shade conceals the microphone.

On one side of the room, just under the red and green lights, is a mahogany table on which rests a small leather covered box with a small lever projecting from it. A small microphone rests alongside of the box-like arrangement. The artist stands in front of the "floor-lamp," the announcer—when he is announcing—sits at the table with the microphone and switch box in front of him.

When everything is arranged and the

speaker, singer or player is ready to start, the announcer takes his place, turns the small lever to the left and makes his announcement.

After doing so he takes a final look over the room to be sure that all is arranged and then moves the lever to the extreme right, cutting out his microphone and cutting in the one in front of the artist. The concert is on. Not one sound—other than the sounds which are supposed to occur, must be made. The red light is glowing.

Leaving the table, the announcer goes across the studio to a booth in one corner. This booth built on the style of those used by telephone companies, is covered with felt and sheet lead and is as near sound proof as is mechanically possible. Windows enable him to see everything that is going on in the room. A small radio set enables him to receive from the air just what is being spoken, played or sung in the studio.

An ordinary telephone connects with the control room adjoining. His small set enables him to hear just what is going on in the same manner in which it is being heard hundreds of miles away.

Back to his table, as the number draws near to its completion, the announcer is ready to make the switch to his own microphone just as soon as the last word is spoken or sung, or the last note is struck. The red light dies out, the green one comes on and when the program is completed and the power turned off in the control room adjoining, this light also is extinguished.

* * *

All of the entertainment is voluntary. The services of the artists are donated. Very often after the regular program, we must start in trying out entertainers who have come in during the evening. It is the only time that most of them can come, as many are employed during the day. We give them a tryout. Often it is found that a person with a wonderful voice is not at all suited for radio broadcasting.

* * *

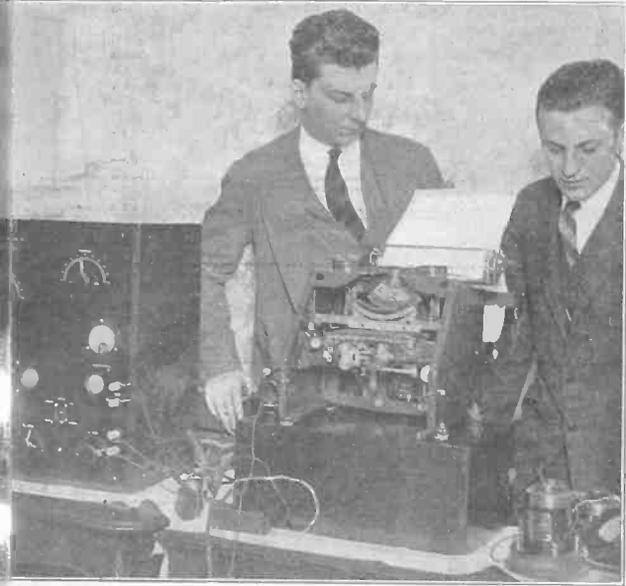
Requests to broadcast personal messages are frequent. These requests are just as diversified as the classified columns of a newspaper.

Recently a man requested we broadcast that he was an expert watchmaker out of work.

* * *

Of all the hundreds of news bulletins broadcast from WGY, those announcing the deaths of President Harding and former President Wilson were the saddest.

News via Radio Printer—Full o' Pep



In a recent test in New York City of the invention of William G. H. Finch, the radio printer operated at the sending station, two miles away, caused the receiving station to print the same words at the same speed—65 a minute. The receiver is called a radio printer, and is operated by wire, as is now done, on a 60-meter wavelength.



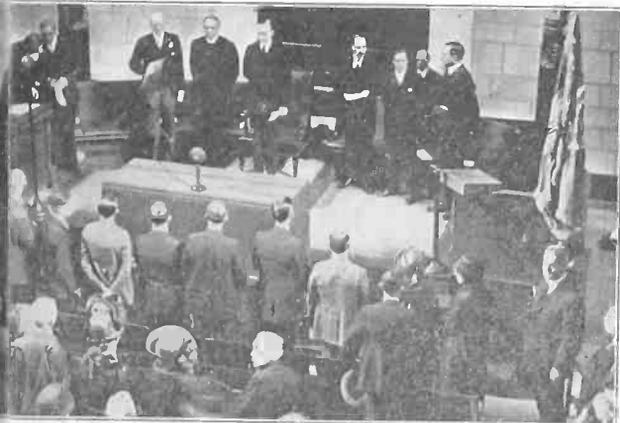
WHEN THAT JOLLY JAZZ comes jouncing over the air it proves entirely too tempting to permit the retention of a serious mien by this beautiful philosopher of the beach. Hence she makes as perfect a picture of rhythm as any "still" can achieve. The program over, she will resume her meditations over Immanuel Kant's transcendental eclectic, else shake a wicked heel at the dance pavilion. You're right.



(International Newsreel)

of the Chicago White Sox. He ended the ball games and he would shout a "let" effect only on the set. For a patient in a home, Mr. Chance heard, due to radio.

THE CHURCH AND THE RADIO are in co-operation more and more day by day. The leading dignitaries recognize in radio a potent agency for spreading their message. Photo shows the Rev. Dr. C. E. Macartney, pastor of the Arch Street Church, Philadelphia, head of the Presbyterian General Assembly.



President Coolidge "mike presence." Hence when his speech at his notification in South, Vt., who listened via radio to the speech of his "favorite son."



(Kadel & Herbert)
THE TAXI RATE in New York is only 20 cents a mile, in this case including listening-in privilege. A loop is erected atop the taxicab and the set, which is in the passenger's compartment, is grounded to the frame of the car. Earphone operation is preferred for obvious reasons.

RADIOCAST PROGRAMS

Wednesday, August 20

WNYC, New York, 526m (570k), E. S. D. S. T.—7:30 P. M., police reports and alarms. 8:30 P. M., musical program composed of band selections and vocal and instrumental numbers by artists. 10:30 P. M., police alarms.

WFAA, Dallas, Tex., 476m (630k), C. S. T.—12:30 P. M., musical recital by the Red-Headed Girl of the Dallas Journal.

WOS, Jefferson City, Mo., 441m (680k), C. S. T.—8 P. M., address, "The Cost of Producing Farm Crops in 1924" by D. C. Wood, extension specialist in farm management, Mo. College of Agriculture, Columbia. 8:20 P. M., musical program by the Iberia String band, Iberia, Mo.

CKAC, Montreal, 425m (710k), E. S. T.—1:45 P. M., Mount Royal Hotel luncheon orchestra. 4 P. M., weather, stocks, news.

KGO, Oakland, Cal., 312m (960k), P. T.—1:30 P. M., New York Stock Exchange and U. S. Weather Bureau reports. 3 P. M., studio musical program. Speaker furnished through the courtesy of the Cora L. Williams Institute, Berkeley, California. 4 to 5:30 P. M., concert orchestra of the Hotel St. Francis, San Francisco. 6:45 P. M., stock exchange and weather reports, and news items.

KFI, Los Angeles, 469m (640k), P. T.—5 P. M., Evening Herold news bulletins. 5:30 P. M., Examiner news bulletins. 6:45 P. M., detective stories and vocal concert. 7:30 P. M., "Mammy" Simmons and Crosby sisters. 8 P. M., Evening Herald-Frank Carrs orchestra. 9 P. M., program from Examiner studio. 10 P. M., Hollywoodland community orchestra. 11 P. M., Ambassador Hotel Coconut Grove orchestra.

WGY, Schenectady, N. Y., 380m (790k), E. S. T.—11:30 A. M., stock market report. 11:40 A. M., produce market report. 11:45 A. M., weather report. 11:50 A. M., report on farm movement of lettuce, from the New York State Dept. of Farms and Markets. 11:5 A. M., time signals. 5 P. M., produce and stock market quotations; news bulletins; baseball results. 5:30 P. M., "Adventure Story" (courtesy of Youth's Companion).

WMAQ, Chicago, 448m (670k), C. S. D. S. T.—4 P. M., sports results. 6 P. M., Chicago Theatre organ recital. 6:30 P. M., stories for the children by Miss Katherine Waller. 8 P. M., weekly Northwestern University lecture. 9 P. M., talk from one of the Chicago charities. 9:15 P. M., program arranged by Carl Craven.

Thursday, August 21

WNYC, New York, 526 m (570k), E. S. D. S. T.—7:30 P. M., Police Alarms—Stolen automobiles and missing persons; official weather forecast by U. S. Weather Bureau. 8:30 P. M., Jascha Gurewicz, saxophone virtuoso. 8:45 P. M., two piano concert by Sam Perry and Herbert Clair. 9 P. M., Dr. Rudolph Rapp of the Department of Health. 9:40 P. M., The Radio Franks—Frank Wright and Frank Bessinger. 10:10 P. M., Clairice Holzhalb, soprano. 10:30 P. M., Police Alarms—Stolen automobiles and missing persons; official weather forecasts by U. S. Weather Bureau.

WNAC, Boston, 278m (1060k), E. S. D. S. T.—10:30 A. M., WNAC Women's Club talk. 1 P. M., Shepard Colonial Orchestra. 4 P. M., Shepard Colonial Orchestra; William H. McNulty, entertainer. 6:30 P. M., WNAC dinner dance. 8 P. M., McDowell Concert Company.

WHN, New York, 360m (830k), E. S. D. S. T.—5 P. M., Leonard Partridge and His Orchestra. 7:30 P. M., Dinner Music—Violin solos by Olcott

Vail, accompanied by Stephen Balogh; Paul Specht's Alamac Orchestra. 9:30 P. M., Charles Strickland's Palisades Park Orchestra. 10 P. M., Vincent Lane, Irish tenor. 10:15 P. M., Harry Hock and His Entertainers. 10:45 P. M., Roseland Ballroom Dance Orchestra. 11 P. M., Rosse Fowler, baritone. 11:15 P. M., Fred Hughes, tenor.

WOC, Davenport, Ia., 484m (620k), C. S. T.—9 A. M., opening market quotations. 10 A. M., household hints. 10:55 A. M., time signals. 11 A. M., weather and river forecast. 11:05 A. M., market quotations. 12 noon, chimes concert. 12:15 P. M., weather forecast. 1 P. M., closing stocks and markets, including weekly reports of wool market. 7 P. M., sport news and weather forecast. 9 P. M., orchestra program, the Palmer School Radio Orchestra

WIP, Philadelphia, 69m (590k), E. S. D. S. T.—6 P. M., official weather forecast. 6:05 P. M., Dinner music by the Kentucky Serenaders. 6:45 P. M., agricultural livestock and produce market reports. 7 P. M., Uncle Wip's Bedtime Stories and Roll Call for the Children. 8 P. M., "Timely Talks to Motorists" talk by Gene Hogle. 8:15 P. M., concert by Comfort's Philharmonic Orchestra, Roy B. Comfort, conductor; soloist, Miss Katherine Nelson, contralto. 8:45 P. M., "What the Wild Waves are Saying," picked up by a microphone placed amidst the breaking waves under the Steel Pier, Atlantic City, N. J. 8:50 P. M., performance of Murphy's Minstrels, direction Frank Elliott. 9:30 P. M., concert by Vessella's Concert Band, Oreste Vessella, conductor.

WEAF, New York, 432m (610k), E. S. D. S. T.—11:12 A. M., Marie Nicholson, soprano; "Shopping for You in Fifth Avenue" by Virginia Walburn; consolidated market and weather reports. 4:6 P. M., Bella Graf, soprano; Marion Schott, pianist; children's stories by Mrs. John J. Schoonhoven. 6:11 P. M., dinner music from the Rose Room of the Hotel Waldorf-Astoria; mid-week services, auspices of Greater New York Federation of Churches, Elmer Grosso and His Versatile Orchestra; Father Octavian Murison, Roumanian basso; "Modern Children's Crusade" by Jackie Coogan, young screen star, auspices Near East Relief; Melville and Robert Hicks, banjoists, and Oscar Race, pianist

WCAE, Pittsburgh, 462m (650k), E. S. D. S. T.—4:30 P. M., stock market reports; the Sunshine Girl; Pittsburgh livestock quotations. 6:30 P. M., dinner concert from William Penn Hotel. 7:30 P. M., Uncle Kaybee. 7:45 P. M., baseball scores. 8 P. M., Moore's Cafeteria Radio Review, E. T. Moores, manager. 9:30 P. M., musical program. 11 P. M., late concert.

KHJ, Los Angeles, 395m (760k), P. T.—6 P. M., Art Hickman's Concert Orchestra, Biltmore Hotel. 6:45 P. M., children's program, presenting Prof. Walter Sylvester Hertzog; weekly visit of Dickie Brandon, screen juvenile; pupils of Mashill Stedman; bedtime story by Uncle John. 8 P. M., program presenting the Gaylord Trio. 9 P. M., program presenting Mary Olive Horton, dramatic soprano; the Piggly Wiggly Trio; the Community Broadcasters of Pasadena in a one act play, "Radio." 10 P. M., Art Hickman's Dance Orchestra, Biltmore Hotel.

WJY, New York, 405m (740k), E. S. D. S. T.—9 P. M., Al Reiser's Club Ferrari Orchestra.

WJZ, New York, 455m (660k), E. S. D. S. T.—1 P. M., Nathan Abas' Hotel Pennsylvania Orchestra. 4 P. M., Eleanor Gunn's fashion talk. 4:10 P. M., daily menu. 4:15 P. M., "The Progress of the World," a Review of Reviews talk. 5:30 P. M., State and Federal agricultural reports; farm and home reports; closing quotations from the New York Stock Exchange; foreign exchange quotations; Evening Post news. 7 P. M., Gotham Hotel Concert Orchestra. 7:20 P. M., financial developments of the day. 7:30 P. M., Gotham Hotel Concert Orchestra. 8 P. M., weekly French lesson. 8:30 P. M., Alexis Kudisch Ensemble and Ethel Miller presented by Ned Jakobs. 10:30 P. M., Waldorf Astoria Roof Orchestra direct.

WOR, Newark, N. J., 405m (740k), E. S. D. S. T.—6:15 P. M., Albert E. Sonn, technical editor, weekly talk on "Radio for the Layman." 6:30 P. M., "Music While You Dine"—Tom Cooper's Country Club Orchestra. 7:20 P. M., resume of the day's sports with Jolly Bill Steink.

KDKA, Pittsburgh, 326m (920k), E. S. D. S. T.—5:30 P. M., dinner concert by KDKA Little Symphony Orchestra, Victor Saudek, conductor. 6 P. M., baseball scores. 6:30 P. M., the Children's Period—Little Miss Merry Heart. 6:45 P. M., news bulletins. 7 P. M., baseball scores. 7:15 P. M., program by the National Stockman and Farmer. 7:40 P. M., Stockman reports of the primary livestock market; grain, feed, sugar, cotton, wool and produce. 8 P. M., concert by the KDKA Little Symphony Orchestra, H. R. Snyder, baritone. 9:55 P. M., time signals, weather forecast; baseball scores. 10 P. M., concert.

KYW, Chicago, 536m (560k) C. S. D. S. T.—5:02 P. M., news, financial and final markets. 6 P. M., dinner concert broadcast from the Congress Hotel. 7:20 P. M., musical program given by Helen Lightfoot, soprano; Florence Anderson, accompanist; William Benson, tenor; Sallie Menkes, accompanist; Marie Hendrickman, Hawaiian guitar. 8:20 P. M., "Safety First" talk by Mr. Z. C. Elkin of Chicago Motor Club. 9-10:30 P. M., "At Home" program.

WBZ, Springfield, Mass., 337m (890k), E. S. T.—7:05 P. M., market reports. 7:10 P. M., Letter from New England Homestead; "At the Theatres," with A. L. S. Wood, dramatic editor. 7:30 P. M., bedtime story for the kiddies. 7:40 P. M., special children's program arranged by Mrs. Charles Loots. 9 P. M., special Hebrew concert arranged by Mr. Ranen, consisting of programs by various Hebrew organizations. 10:55 P. M., time signals, official United States weather reports.

Friday, August 22

WNYC, New York, 526m (570k), E. S. D. S. T.—7:30 P. M., Police Alarms—Stolen automobiles and missing persons; official weather forecasts by U. S. Weather Bureau. 8:30 P. M., Hudson Novelty Dance Orchestra 9:15 P. M., joint recital by Marie Dimitry, soprano and Joseph Davies, baritone. 9:45 P. M., piano recital. 9:55 P. M., Estelle Ehrlich, coloratura soprano. 10:30 P. M., Police Alarms—Stolen automobiles and missing persons; official weather forecasts by U. S. Weather Bureau. 11:40 P. M., midnight dance program by Nat Martin's Orchestra from "I'll Say She Is."

WRC, Washington, 469m (640k), E. S. T.—3 P. M., Fashion Developments of the Moment prepared by "Women's Wear." 3:10 P. M., song recital by Arthur McCormick, baritone. 3:20 P. M., "Beauty and Personality" by Elsie Pierce. 3:25 P. M., Current Topics by the editor of "The Review of Reviews." 3:35 P. M., piano recital by Ethel Grant. 3:50 P. M., Magazine of Wall Street. 4 P. M., song recital. 5:15 P. M., time signals and weather forecasts. 6 P. M., stories and songs for children by Peggy Albion.

WHN, New York, 360m (830k), E. S. D. S. T.—4:15 P. M., Jos. C. Wolfe, baritone. 4:30 P. M., Henrietta Grennan, soprano. 4:45 P. M., Wm. J. Stuart, author of "Candlelight Philosophy." 7:30 P. M., Dinner Music—Violin solos by Olcott Vail, accompanied by Stephen Balogh; Paul Specht's Famous Alamac Orchestra. 9:30 P. M., Charles Strickland's Palisades Park Orchestra. 10 P. M., Minnie Banges, concert pianist. 10:10 P. M., F. Oneida, harmonica soloist. 10:20 P. M., Wright & Bessinger, "The Radio Franks." 10:30 P. M.—Roseland Ballroom Dance Orchestra. 11 P. M.—Melody Four Male Quartet, James Beckert, piano and uke. 11:15 P. M., Mary Meares, dramatic soprano. 11:30 P. M., Club Alabam Revue.

WOC, Davenport, Ia., 484m (620k), C. S. T.—9 A. M., opening market quotations. 10 A. M., household hints. 10:55 A. M., time signals. 11 A. M., weather and river forecast. 11:05 A. M., market quotations. 12 noon, chimes concert. 12:1 P. M., weather forecast. 1 P. M., closing stocks and markets. 7 P. M., sport news and weather forecast. 8 P. M., musical program. 9 P. M., weekly tourists' road bulletin.

WOO, Philadelphia, 509m (590k), E. S. D. S. T.—12 noon, luncheon music by Tea Room Orchestra. 12:55 P. M., time signals. 4:45 P. M., Grand Organ and Trumpets. 7:30 P. M., sports results and police reports; dinner music, Hotel Adelphia Roof Garden Orchestra. 8:30 P. M., musical program, Aztec Male Quartette. 9:15 P. M., address, J. Maxwell Smith. 9:30 P. M., Grand Organ recital, Harriette G. Ridley. 10 P. M., dance program by A. Candelori and His Hotel Adelphia Roof Garden Orchestra. 10:55 P. M., time signals. 11:02 P. M., weather forecast.

WEAF, New York, 492m (610k), E. S. D. S. T.—11:12 A. M., Bertha Van Vliet, soprano, accompanied by William J. Fisk; talk on Gladioli for Every Garden by Kenneth R. Boynton of the New York Botanical Gardens; market and weather reports. 4:5 P. M., Regent Instrumental Trio, Irene Barbara Eckes, soprano, accompanied by Walter C. Rogers. 6-10 P. M., dinner music from the Rose Room of the Hotel Waldorf-Astoria; Bernard and Robinson, the Dixie stars; Louise Flanagan, pianist; Mr. Selkowitz, violinist and Solomon Pinsler, pianist; B. Fischer and Company's "Astor Coffee" Orchestra.

WCAE, Pittsburgh, 462m (650k), E. S. D. S. T.—12:30 P. M., news; weather reports; reading of program for the day. 3:30 P. M., baseball scores. 4:30 P. M., Sunshine Girl; stock market reports; Pittsburgh livestock quotations. 6:30 P. M., dinner concert from William Penn Hotel. 7:30 P. M., Uncle Kaybee. 8-9:30 P. M., baseball scores; silent. 9:30 P. M., musical program.

Who Is America's Most Popular Radio Entertainer?

Everybody is interested in this query: Who is America's most popular radio entertainer? You have your favorite. Who is she or he? Let us know your choice, whether a comedian, an opera singer, a jazz band, or a story-teller.

RADIO WORLD wants to be able to tell the world the name of the entertainer who stands highest in the regard of listeners-in.

Use the accompany blank and mail to Radiocasting Manager, RADIO WORLD.

Cut off. Fill out. Mail today.

RADIOCASTING MANAGER, RADIO WORLD,
1493 Broadway, New York City.

Dear Sir:

My favorite entertainer is..... Station.....

Name.....
Street Address.....
City and State.....

Yearly subscribers for RADIO WORLD may, when sending in their \$6.00 for a yearly subscription, vote the entire fifty-two issues in advance for their favorite entertainer, when they so designate their desire to do so. In the August 16 issue was published a tally showing H. M. Snodgrass, of WOS, Jefferson City, Mo., leading.

Another tally will be made and published in RADIO WORLD soon and an important announcement made.

WJY, New York, 405m (740k), E. S. D. S. T.—7:30 P. M., Leonard Nelson's Knickerbocker Grill Orchestra. 8:30 P. M., Omni-Oral production, "The Mardi Gras."

WJZ, New York, 455m (660k), E. S. D. S. T.—1 P. M., Hotel Ambassador Trio. 4 P. M., Eleanor Gunn's fashion talk. 4:10 P. M., daily menu. 4:15 P. M., arts and decorations talk. 4:30 P. M., Hotel Astor organ recital. 5:30 P. M., State and Federal agricultural reports; farm and home reports; closing quotations New York Stock Exchange; foreign exchange quotations; Evening Post news. 7 P. M., Ernie Golden's McAlpin Roof Orchestra. 7:20 P. M., financial developments of the day. 8 P. M., Looseleaf Current Topics by William H. Allen. 8:10 P. M., Golden Band Concert, direct from Mall, Central Park, Tchaikowsky program; Waino Kauppi, cornetist. 10 P. M., Time Pop Question game. 10:30 P. M., Harold Stern's Belleclair Towers Orchestra.

WOR, Newark, N. J., 405m (740k), E. S. D. S. T.—6:15 P. M., "Music While You Dine," Sammy Halpern and His Orchestra. 6:30 P. M., "Man in the Moon" stories for the children by Josephine Lawrence and William F. B. McNeary. 7:20 P. M., resume of the day's sports with Jolly Bill Steinke.

KDKA, Pittsburgh, 326m (920k), E. S. D. S. T. 5:30 P. M., organ recital by Paul Fleecker. 6 P. M., baseball scores. 6:30 P. M., the Children's Period—"The Squire's Bride." 6:45 P. M., news bulletins. 7 P. M., baseball scores. 7:40 P. M., Stockman reports of the primary livestock markets; grain, feed, sugar, cotton, wool and produce. 8 P. M., concert by Arden H. Thomas and Sebastian Sapientza, saxophonists; Gomer Jones, baritone; George Walker, tenor. 9:55 P. M., time signals; weather forecast; baseball scores.

KWV, Chicago, 536m (560k), C. S. D. S. T.—5:02 P. M., news, financial and final markets; Dun's Review and Bradstreet's Weekly Review of Chicago Trade. 5:45 P. M., children's bedtime story told by "Uncle Bob." 6 P. M., dinner concert broadcast from the Congress Hotel. 9-11:30 P. M., midnight revue.

WBZ, Springfield, Mass., 337m (890k), E. S. T.—7:05 P. M., market report. 7:10 P. M., "Clutch Transmission and Differentials" by Riga & Sons; current book review. 7:30 P. M., bedtime story for the kiddies. 10 P. M., an evening of opera by Maude Erickson, soprano, and Stephen Sobolewski, baritone. 10 P. M., time signals; weather reports. 11 P. M., concert by Willard Clark, baritone, and Benjamin Buxton, pianist and accompanist.

Saturday, August 23

WNYC, New York, 526m (570k), E. S. D. S. T.—7:30 P. M., Police Alarms—Stolen automobiles and missing persons; weather forecasts. 8:30 P. M., xylophone solos by Sigmund Kempner. 8:45 P. M., harp and violin duo, Helen White Ruoss, harpist, and Isadore Leezenbaum, violinist. 9:10 P. M., xylophone solos by Sigmund Kempner. 9:25 P. M., Helen White Ruoss and Isadore Leezenbaum. 9:45 P. M., a concert of vocal music by favorite artists. 10:30 P. M., Police Alarms—Stolen automobiles and missing persons.

WRC, Washington, 469m (640k), E. S. T.—6:20 P. M., baseball scores. 7:45 P. M., Bible talk. 8 P. M., song recital by Ruby Potter, soprano; Louis A. Potter at the piano. 8:15 P. M., piano recital by Louis A. Potter. 9 P. M., concert of Latin-American music by the United States Marine Band. 9:55 P. M., time signals and weather forecast.

WNAC, Boston, 278m (1080k), E. S. D. S. T.—8:30 P. M., dance music from Hotel Westminster Roof Garden. 9:30 P. M., dance music, Copley-Plaza Orchestra; popular songs by Ted and Dick Waterson; Don Ramsay, accompanist; popular songs by Irving Crocker.

CKAC, Montreal, 430m (700k), E. S. T.—7 P. M., kiddies' stories in French and English. 7:30 P. M., Rex Battle and His Mount Royal Hotel Classic Orchestra, Benjamin Scherzer, violin. 8:30 P. M., La Presse Studio program. 10:30 P. M., Mount Royal Hotel Roof Garden Orchestra.

WIP, Philadelphia, 509m (590k), E. S. D. S. T.—6 P. M., weather forecast. 6:05 P. M., dinner music by Kentucky Serenaders. 6:45 P. M., U. S. Dept. of Agriculture livestock and produce market reports. 7 P. M., Uncle Wip's Bedtime Stories and Roll all for the children. 8 P. M., concert by Comfort's Philharmonic Orchestra. 8:45 P. M., "What the Wild Waves are Saying." 8:50 P. M., concert by Vessella's Concert Band. 10 P. M., dance music by Bob Leman's Dance Orchestra. 11:05 P. M., organ recital by Karl Bonawit.

WEAF, New York, 492m (690k), E. S. D. S. T.—4:5 P. M., Bruno Brothers Orchestra. 6-11 P. M., dinner music from the Rose Room of the Hotel Waldorf-Astoria; Hotel Graystone Dance Orchestra; Sylvia D. Lyons, pianist; Charles A. Schenck, Jr., baritone; Myrtle Wagner Whitt, coloratura soprano; Vincent Lopez and His Orchestra from the Roof Garden of the Hotel Pennsylvania.

WCAE, Pittsburgh, 462m (690k), E. S. D. S. T.—3 P. M., piano recital by Prof. Otto Kalteis. 3:15 P. M., baseball schedule. 4:30 P. M., Pittsburgh livestock quotations. 6:30 P. M., dinner concert from William Penn Hotel. 7:30 P. M., Uncle Kaybee. 7:45 P. H., baseball scores. 9:30 P. M., musical program.

KHJ, Los Angeles, 395m (760k), P. T.—12:30 P. M., program of music and news items. 6 P. M., Art Hickman's Concert Orchestra, Biltmore Hotel. 6:45 P. M., children's program, Prof. Walter Sylvester Hertzog, stories of American history; Helene Bertz, screen juvenile; bedtime stories by Uncl John. 8 P. M., De luxe program. 10-11 P. M., Art Hickman's Dance Orchestra, Biltmore Hotel.



(Foto Topics)
GEORGES CARPENTIER signing off!

WJZ, New York, 455m (660k), E. S. D. S. T.—1 P. M., Hotel Vanderbilt Orchestra direct. 4 P. M., Garratt J. Fitzsimmons, tenor. 4:30 P. M., Roger Wolfe's Biltmore Tea Room Orchestra. 5:30 P. M., State and Federal agricultural reports; farm and home reports; closing quotations New York Stock Exchange; foreign exchange quotations; Evening Post news. 7 P. M., Waldorf-Astoria Roof Orchestra. 8 P. M., "Chinese Receipts," Mrs. Ethel Moore Rook. 10:30 P. M., Hotel Astor Roof Orchestra.

WOR, Newark, N. J., 405m (740k), E. S. D. S. T.—6:15 P. M., "Music While You Dine," Ernie Krickett's Cinderella Orchestra. 7:15 P. M., resume of the day's sports with Jolly Bill Steinke. 8 P. M., Workmen's Circle Chorus of 75 voices of Newark conducted by A. Abramowitz, assisted by Fanny Horowitz, pianist. 9 P. M., recital by Lois Ewell, soprano, Ralph Douglas, piano. 9:15 P. M., tenor solos by Antonio Pesci. 9:30 P. M., William Calhoun in a humorous talk entitled "The Modern Mother vs. the Flapper."

KDKA, Pittsburgh, 326m (920k), E. S. D. S. T.—5:30 P. M., dinner concert by Westinghouse Band, T. J. Vastine, director. 6 U. M., baseball scores. 6:30 P. M., the Children's Period—Taper Tom. 6:45 P. M., last-minute helps to teachers. 7 P. M., baseball scores; stock review by James J. Long. 8 P. M., concert by Westinghouse Band; C. McMillan, baritone. 9:55 P. M., time signals; weather forecast; baseball scores.

WBZ, Springfield, Mass., 337m (890k), E. S. T.—7 P. M., results of games, Eastern, American and National Leagues. 7:05 P. M., market reports. 7:30 P. M., bedtime story for the kiddies. 7:40 P. M., concert by the Hotel Kimball Trio. 9 P. M., voice recital, direction Isidore Braggiotti. 9:30 P. M., to be announced. 10:55 P. M., time signals; weather reports.

Sunday, August 24

WHAS, Louisville, Ky., 400m (750k), C. S. T.—9:57 A. M., organ music. 10 A. M., church service, auspices Seventh Day Adventists Church, the Rev. Dr. Robert J. Bryant, pastor. 4-5 P. M., concert, direction of Mrs. Harry R. Moore.

KPO, San Francisco, 423m (710k), P. T.—10 A. M., Hebrew services conducted by Rabbi Fried. 11 A. M., undenominational and non-sectarian church services; speaker, Dr. C. C. Bulda; soloist, Belle Jacobs Lewis, contralto; organ selections by Theodore J. Irwin. 8:30-10 P. M., concert by Rudy Seiger's Fairmont Hotel Orchestra.

WGY, Schenectady, 380m (790k), E. S. T.—9:30 A. M., services of First Presbyterian Church, Schenectady, N. Y. 7:17 P. M., program by Goldman's Band, Edwin Franko Goldman, conductor, broadcast from The Mall, Central Park, New York.

WOS, Jefferson City, Mo., 441m (680k), C. S. T.—7:30 P. M., union open air religious services broadcast from Capitol lawn; music by the Missouri State Prison Concert Band.

WIP, Philadelphia, 509m (590k), E. S. D. S. T.—3:35 P. M., special Sunday afternoon concert by Comfort's Philharmonic Orchestra. 7:45 P. M., evening service from Holy Trinity Church, Philadelphia, Rev. Floyd W. Tomkins, D. D., rector. 9:30 P. M., Sunday evening concert with prominent soloists.

KYW, Chicago, 536m (560k), C. S. D. S. T.—10 A. M., Sunday morning service broadcast from

Albert Greene Makes A Hit at WNYC

ALBERT GREENE, tenor, of 71 East 116th Street, New York City, made his first appearance at New York City Municipal Station, WNYC, the evening of August 13. An audition before the station directors, lasting exactly three minutes and held before the regular program started, convinced the directors he was "there." Mr. Greene's sterling tenor voice made an instant hit, and as a result he will appear frequently at WNYC.

St. Chrysostom's Episcopal Church, Chicago, Rev. Norman Hutton, rector. 1:30 P. M., studio chapel service broadcast from studio in the Commonwealth Edison Building, Chicago.

Monday, August 25

WNYC, New York, 526m (570k), E. S. D. S. T.—7:30 P. M., police reports and alarms. 8:30 P. M., musical program composed of band selections and vocal and instrumental numbers by artists. 10:30 P. M., police alarms.

WNAQ, Chicago, 448m (670k), C. S. D. S. T.—4 P. M., sport results. 6 P. M., Chicago theatre organ recital. 6:30 P. M., Hotel LaSalle Orchestra.

KFI, Los Angeles, 469m (640k), P. T.—5 P. M., Evening Herald news bulletins. 5:03 P. M., Examiner News bulletins. 8 P. M., Evening Herald Radiolians Dance Orchestra. 9 P. M., program from Examiner studio. 10 P. M., Ambassador Hotel Coconut Grove Orchestra.

WHAZ, Troy, N. Y., 380m (790k), E. S. T.—9 P. M., concert by soloists and orchestra, with readings.

KGO, Oakland, Cal., 312m (960k), P. T.—1:30 P. M., New York stock report and weather. 3 P. M., studio musical program. 4-5:30 P. M., Henry Halstead and His Dance Orchestra. 5:30 P. M., Aunt Betty stories and the KGO Kiddies' Klub. 6:45 P. M., stock reports, weather, baseball scores and news items. 8 P. M., educational program; course in agriculture, Spanish, music, economics and literature; music by Arion Trio, 10 P. M.—1 A. M.—Dance music, Henry Halstead's Orchestra, assisted by soloists. Hotel St. Francis.

WOS, Jefferson City, Mo., 441m (680k), C. S. T.—8 P. M., address, "Have You Had Your Lime Today?" and "Developing a \$100,000,000 Industry" by A. T. Nelson, State Marketing Commissioner. 8:20 P. M., dance program by the Varsity Players' Orchestra of Missouri University.

WMC, Memphis, Tenn., 500m (600k), C. S. T.—8:30 P. M., program by the Hotel Gayoso Orchestra.

Tuesday, August 26

WHAS, Louisville, Ky., 400m (750k), C. S. T.—4 P. M., selection by the Alamo Theatre Orchestra; police bulletins; weather forecast; readings; "Just Among Home Folks"; late news bulletins. 4:50 P. M., local livestock, produce and grain market reports; 4:55 P. M., baseball scores. 5 P. M., Central Standard time announced. 5:30-9 P. M., concert by Keith Kannard and his Kentucky Ramblers; late news bulletins; baseball scores; official Central Standard time announced at 9 o'clock.

KPO, San Francisco, 423m (710k), P. T.—1 P. M., Rudy Seiger's Fairmont Hotel Orchestra. 2:30 P. M., organ recital by Theodore J. Irwin. 4:30 P. M., Rudy Seiger's Fairmont Hotel Orchestra. 5:30 P. M., children's hour stories by Big Brother of KPO. 7:30 P. M., Rudy Seiger's Fairmont Hotel Orchestra. 8 P. M., program, management of Mrs. A. Bruner.

WGY, Schenectady, 380m (790k), E. S. T.—11:30 A. M., stock market report. 11:40 A. M., produce market report. 11:50 A. M., report on farm movement of lettuce, from the New York State Dept. of Farms and Markets. 11:55 A. M., U. S. Naval Observatory time signals. 1 P. M., music and address, "A Novel Gift Shop," Mrs. C. W. Ashworth. 5 P. M., produce and stock market quotations; news bulletins; baseball results. 6 P. M., dinner music by Joseph A. Chickene and His Clover Club Orchestra. 7:40 P. M., baseball scores. 7:4 P. M., program by Jack Taylor's Orchestra. 10:15 P. M., organ recital by Stephen E. Boisclair.

WMC, Memphis, Tenn., 500m (600k), C. S. T.—8:30 P. M., Harry O. Nichols organ recital from Scottish Rite Cathedral. 11 P. M., Midnight Frolic.

CKAC, Montreal, 430m (700k), E. S. T.—4 P. M., weather; stock; news; 7 P. M., kiddies' stories in French and English. 7:30 P. M., dinner concert from Mount Royal Hotel. 8:30 P. M., England's latest musical selections. 10:30 P. M., dance program by Joseph C. Smith and His Mount Royal Hotel Orchestra.

Wednesday, August 27

WNYC, New York, 526m (570k), E. S. D. S. T.—7:30 P. M., police reports and alarms. 8:30 P. M., musical program composed of band selections and vocal and instrumental numbers by artists. 10:30 P. M., police alarms.

WMAQ, Chicago, 448m (670k), C. S. D. S. T.—4 P. M., sports results. 6 P. M., Chicago theatre organ recital. 6:30, stories for children by Miss Katherine Waller. 9 P. M., talk from one of the Chicago charities. 9:1 P. M., Oscar Williamson, tenor.

KFI, Los Angeles, 469m (640k), P. T.—5 P. M., Evening Herald news bulletins. 5:30 P. M., Examiner News bulletins. 6:4 P. M., detective stories and vocal concert. 7:30 P. M., "Mammy" Simmons and Crosby Sisters. 8 P. M., Evening Herald-Frank Carr's Orchestra. 9 P. M., program from Examiner studio. 10 P. M., Hollywoodland Community Orchestra. 11 P. M., Ambassador Hotel Coconut Grove Orchestra.

KGO, Oakland, Cal., 312m (960k), P. T.—1:30 P. M., New York stock reports and weather. 3 P. M., musical program and Cora L. Williams Institute speaker. 4 P. M., concert orchestra, Hotel St. Francis, San Francisco. 6:45 P. M., stock reports, weather, baseball scores, and news items.

WOS, Jefferson City, Mo., 441m (680k), C. S. T.—8 P. M., address, "Wheat Production in Missouri" by W. C. Etheridge, Professor of Field Crops. 8:20 P. M., barn dance or quadrille music played by the Old Time String Trio.

A THOUGHT FOR THE WEEK

Radio wave, thou soarest through the air, thy pulsing path my route of joy through life.

RADIO WORLD

Title Reg. U. S. Pat. Off.

TELEPHONE: LACKAWANNA 2062, 6976
PUBLISHED EVERY WEDNESDAY

(Dated Saturday of same week)

FROM PUBLICATION OFFICE,

HENNESSY RADIO PUBLICATIONS CORPORATION

BOLAND BURKE HENNESSY, President

M. B. HENNESSY, Vice-President

FRED S. CLARK, Secretary and Manager

1493 BROADWAY, NEW YORK, N. Y.

New York Representatives: James H. Carroll, W. H. Oke.

Circulation Manager: David Yokel.

Boston Representative: Chas. H. M. White, 18 Stuart

Street, Boston, Mass.

Chicago Representative: Mat. H. Friedman, 519 East 60th

Street, Chicago, Ill.

Cincinnati Representative: Samuel H. Jaffee, 1117

Provident Bank Bldg., Cincinnati, O.

European Representative: The International News Co.,

Bremsa Bldgs., Chancery Lane, London, Eng., Paris,

France. Brentano's 38 Avenue de l'Opera.

EDITOR, Roland Burke Hennessy
MANAGING EDITOR, Herman Bernard
TECHNICAL EDITOR, N. N. Bernstein

SUBSCRIPTION RATES

Fifteen cents a copy, \$6.00 a year, \$2.00 for six months, \$1.50 for three months. Add \$1.00 a year extra for foreign postage. Canada, 50 cents.

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

ADVERTISING RATES

FLAT RATE—Page, 7 1/2 x 11", \$160; half page, 3 1/2 x 5 1/2", \$75; quarter page, 1 3/4 x 5 1/2", \$37.50; one col., 2 1/4 x 11", \$50—\$5 per inch. Back cover page, two columns, \$250. Preferred positions 30% extra.

CLASSIFIED ADVERTISEMENTS

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

Entered as second-class matter, March 28, 1922, at the Post Office at New York, New York, under the act of March 3, 1879.

AUGUST 23, 1924

Failure to Announce Call Letters Is Offensive to Fans

STATIONS that radiocast programs that they are proud of should register that pride by announcing their identity with each new number. Stations that are not proud of their programs, instead of concealing their identity intentionally or otherwise, should get into the majority class—the group that is offering good entertainment and instruction. In the early days of radiocasting each announcer would clearly reveal the call letters with punctilious regularity and obedience to the rule. Now the tendency to neglect this important service is growing. Let us get back on the right path. It is annoying to many if they must hear three or four selections without knowing from what station they are being transmitted. Not everybody can identify a station by the dial settings. On many sets different combinations bring in the same station and one must know the announcer's voice or the "individuality" of the modulation to atone for the announcer's neglect.

Marching Onward

HOW would you like to add the effect of an extra tube to your set, without having to buy an extra tube or defray the cost of operating it? Without buying an extra socket or doing any additional wiring in your set or change your set itself in any way? You may think that it can not be done, but it has been done and with such great success that it is indeed a pleasure to enable RADIO WORLD readers to share this bounty. The leading article in next week's RADIO WORLD, issue of August 30, on sale Wednesday, August 27, will tell you all about it. *The diagrams alone will splendidly elucidate the subject to you, yet there is a touch of the intimate, a recounting of personal experiences and a statement of theoretical and practical information that enhances the value of the vivid diagrams engagingly. The author is Neal Fitzalan, brilliant radio experimenter and intrepid son of honored Irish soil who often blazes new paths. RADIO WORLD is privileged to present his contributions to the march of radio events, for he frequently produces something that justly entitles its introduction to the public to be called an event. You will find out in next week's issue what it is all about. You may be surprised to learn that the achievement he sets forth costs very little indeed. Those are the things that count—the methods for obtaining highest efficiency at next to no extra cost. By spending large amounts of money it is possible to get big results, but it takes a genius like Mr. Fitzalan to show you how to get highest efficiency without severe injury to your pocketbook.

The improvements strongly recommended by Mr. Fitzalan have to do not only with tonal quality, but with getting greater distance. That is something that appeals to the heart of every radio fan—distance. It is true indeed that distance lends enchantment to the ear. Well, Byrt C. Caldwell, whose contributions to RADIO WORLD have proved among the most popular, finds after many tests that the Ultradyné is the set to build, if distance is your goal. No other circuit gets distance as well, he reports, and so he has written an article on "How to Build Lacault's Ultradyné." He gives directions for making the intermediate-frequency transformers and oscillator coils yourself and if you are interested in DX you will be interested in what Mr. Caldwell sets forth.

Always popular is a discussion of an audio-frequency circuit. Nearly all fans know the wiring as well as they know their own names. Interest focuses on getting two stages of transformer-coupled audio-frequency amplification into small space without any bad results. To do this constitutes an interesting experiment in engineering. While the accomplishment of the goal is no sensational contribution to radio's advance, nevertheless it is valuable to have the whole problem solved for you, so that two such stages can be encompassed on a 4 1/2" x 5" baseboard. This article, by Herman Bernard, deals with the addition of the AF circuit to the One-Dial Set that he designed and which is described in the present issue. However, the exposition to be published next week applies, of course, to any circuit. A sufficient number of the diagrams that accompany the article are published actual size, to make the whole solution doubly obvious. The article is so written that even a person who knows nothing at all about radio will be able to construct the AF circuit, thus using a loud speaker instead of present earphones.

If transformers of good make are used there will be no annoying distortion, which is important to avoid. It is well established that transformer coupling gives excellent volume and careful circuit construction—already worked out for you—helps to get rid of the distortion problem forever.

However, there is another form of audio-frequency amplification, e.g., resistance-coupled. If the work is well done and good parts used you will get about the same volume from these three such stages as from two stages of transformer-coupled AF. Also the resistance method avoids distortion, purity of tone being preserved even though three tubes are in the AF circuit. N. N. Bernstein, Technical Editor, in his two-part article on "A Low-Loss Superdyné," which begins in the present issue and ends in the next, chooses resistance-coupled AF. The Superdyné circuit, which RADIO WORLD has been featuring steadily because it knows its readers are enthusiastic over this hook-up, produces marvelously clear and pure tones. These are faithfully preserved even when emitted by the loud speaker from the third stage of the resistance-coupled AF, construction of which Mr. Bernstein will explain in conscientious detail. The article, therefore, serves a double purpose. It tells how to build the Superdyné on the low-loss plan, thus enhancing a fine circuit, and sets forth how to construct three stages of resistance-coupled AF that may be added to the Superdyné or to any other circuit whatever.

While due consideration is given to audio-frequency in the next issue attention is also paid to radio-frequency amplification. Tuned RF is by far the best. Why? How should you use it and when? This is told by Lieut. Harry F. Breckel in an article entitled "Why You Should Employ Tuned RF." Getting DX clearly and consistently is impossible without RF, hence a discussion of RF is indeed an absorbing topic. Constructional data will be furnished, of course.

RADIO WORLD

TABLE OF CONTENTS

August 23, 1924.
Vol. 5. No. 22.
15 Cents.

A Weekly Paper Published Every Wednesday and Dated Saturday, by Hennessy Radio Publications Corporation from Publication Office, 1493 Broadway, New York, N. Y.

A Low-Loss, Single-Dial Set, by Herman Bernard. (Illustrated).....	Page 3
A Selective Crystal Set, by Lieut. Peter V. O'Rourke. (Illustrated).....	Page 7
A Low-Loss Neutrodyne, Part II, concluding installment. (Illustrated).....	Page 9
Set Works Without Aerial or Ground, by Weldon Warren. One RF Stage Detector and 2 AF Stages. (Illustrated).....	Page 12
Low-Loss in the Superdyné—5 Tubes; How to Build This Popular Circuit With 3 Stages of Resistance AF. By N. N. Bernstein, Technical Editor.....	Page 13
Adventures of An Obliging Home Constructor, by Charles J. Ridwell.....	Page 14
News and Features in Photographs.....	Pages 16 and 17
Advance Radiocast Programs for a Week. (Illustrated).....	Page 18
The Radio University (Questions and Answers). (Illustrated).....	Page 21
The Radio Trade.....	Page 22
Latest News.....	Page 23

The Radio University

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

I understand there are four or five patents for devices for taking current from the lighting mains to be used for the batteries on radio sets, but so far have not seen any advertised in the radio magazines. Are there any such transformers on the market that do this work so that no other batteries are required, and if so where could I get one?—I. T. Nedland, Hillsboro, N. Dak.

Several such appliances have recently come to notice, but for some reason or other they apparently are not yet ready for the market, and no prices have been announced.

Will you please assist me in solving the following problems? 1—I am using an improved Superdyne and wish to use the Metaform frequency-changer in connection with it. I have two Signal 43-plate condensers which I wish to cut down to be used with the Metaform. How many plates shall I remove to give me a value of .00035 mfd., as called for in the directions? 2—I would also like to cut down the insulation on the end plates of these condensers as described in the article by Dennis J. O'Flaherty in the July 5 issue on Low Loss Con-

Workrite transformers. Will these be all right?—K. E. Haworth, 1121 Lake St., Fort Morgan, Col. Write to the Freed-Eisemann Radio Corp., Sperry Bldg., Brooklyn, N. Y. Your Workrite transformers, radio-frequency, of course, are suitable for any Neutrodyne circuit.

I am troubled with fading signals lately and have a little trouble in picking up Chicago stations. Is there anything I can do to avoid this?—Harold R. Umstadt, Califax, Ill.

You cannot avoid fading signals, as that phenomenon is due to the constantly changing condition of the weather and atmosphere. The trouble will disappear to a great extent when cooler weather arrives.

I have a 4-tube Acme Reflex set. I wish you would publish a circuit for a 2-tube reflex using 199 tubes and some simple form of tuning. I would like the tuning forms to be on spider webs.—Frank H. Cooley, 206 Chestnut Hill Ave., Brighton, Mass.

Fig. 29 is the circuit diagram of an efficient

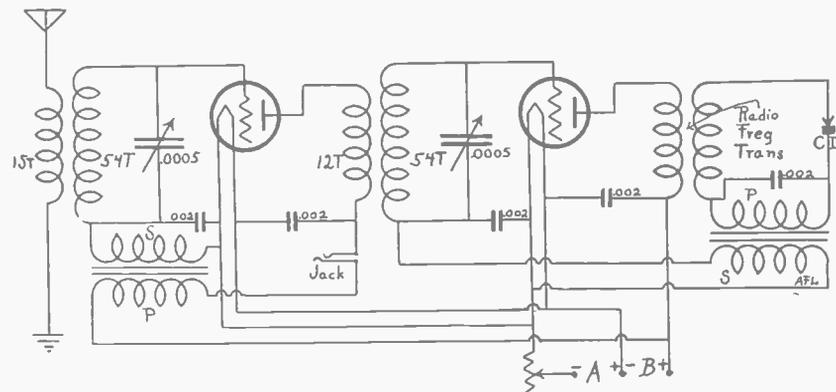


FIG. 29 circuit diagram of 2-tube reflex set using two 199 tubes. This set has two stages of tuned radio-frequency, crystal detector and two reflexed stages of audio-frequency amplification. Only two tuning controls are necessary. Asked for by Frank H. Cooley, 208 Chestnut Hill Ave., Brighton, Mass. The crystal detector goes to the B plus of the first AF transformer (extreme right). The G post of the first AFT goes to the bottom of the second spider web coil. Post P of the second (left hand) AFT goes to one side of the jack. The G post of the second AFT goes to the bottom of the first spider web coil.

densers. If the end plates were cut away, what difference would it make in the capacity, and how much, if any? 3—Kindly give me the winding directions for the Metaform fixer coils and the size tubing to use.—J. H. Shumaker, 787 Washington St., Norwood, Mass.

1—Take off 10 stationary plates and 10 rotary plates, leaving 23, that is, 12 stationary and 11 rotary. This will give you approximately the required capacity. 2—The change in capacity after reducing the insulation is slight, generally showing an increase. This is because the reduced insulation leaves a smaller leakage field, thus forcing that energy which before leaked off to apply itself to the condenser plates. 3—The Metaform coils are wound on 3 or 3½-inch bakelite or radion tubes, about 3¼ inches long. The size wire used may be either No. 22 or 24 DSC. L1 has 10 turns, L2 has 60 turns; L3 has from 10 to 40 turns, and L4 from 5 to 20 turns. The turns on L3 and L4 are optional, and it was found by several experimenters that the 30-15 combination worked well. The windings of each coil may be side by side or end to end. In any event the coupling should be rather close.

Where can I get a Fried-Eisemann 5-tube circuit diagram, with all values designated? I have

2-tube reflex set using the inverse principle. Two 199 tubes are used for two stages of radio-frequency and two stages of audio-frequency amplification, reflexed, while the crystal serves as the detector. The forms may be wound on spider-web forms with No. 22 double silk covered wire. The number of turns is designated on the diagram. The fixed radio-frequency transformer is the standard type sold in any radio store. The audio-frequency transformers are both 5-to-1 ratio. If the set tunes broad, reduce the number of turns on the first spider-web to six or even four turns. All the constants are marked on the diagram so you will have no trouble in getting the proper parts.

Regarding the 4-tube Superdyne circuit published in RADIO WORLD, May 17, how is the coil L2 mounted? Is it placed back of the condenser or fastened to the baseboard?—Louis Kjorstal, 829½ Main St., Eau Claire, Wis.

Many prefer to mount the plate coil directly onto the back of the condenser by means of supporting connections, while others prefer to screw the tube to the base. The former is the better way as it keeps the connections shorter and also keeps the plate wires away from the baseboard, through which some energy is liable to leak.

MAGNAVOX Radio Products



New model R3—\$35.00

Current consumption in the new Magnavox Reproducer R3 is so low that it is an unimportant factor.

This feature, combined with the new Volume Control, makes the new R3 indispensable for use with every radio receiving set.

Magnavox Reproducers

- R2 with 18-inch curvex horn \$50.00
- R3 with 14-inch curvex horn \$35.00
- M1 with 14-inch curvex horn. Requires no battery for the field. \$30.00
- M4 Latest Magnavox Reproducer. Requires no battery. . . \$25.00

Magnavox Combination Sets

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

Magnavox Power Amplifiers

- A1—new 1-stage Power Amplifier \$27.50
- AC-2-C—2-stage Power Amplifier \$50.00
- AC-3-C—3-stage Power Amplifier \$60.00

Magnavox products are sold by reliable Dealers everywhere. Write for catalogue.

The Magnavox Company
Oakland, California
New York and San Francisco
Canadian Distributors
Perkins Electric Limited
Toronto Montreal Winnipeg

Join RADIO WORLD'S University Club

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.

Name

Street

City and State.....

Pacific Exposition Sets Record

The Radio Trade

Exhibit Held on Stupendous Scale

THE highest record ever reached by a radio exposition on the West Coast was achieved at the Pacific Radio Exposition here, under the auspices of the Pacific Radio Trade Association. The stupendous scale on which it was conducted during the six days that it ran, the splendid appointment of the exhibits, the artistic effect achieved and the large attendance indelibly stamped the event with a firm imprint of success.

The committee headed by A. S. Lindstrom made all arrangements for the success of the event. The opening day was marked by a street parade representing the radio interests and more than 200 decorated automobiles were in the line of march through the principal streets of the city.

Secretary of Commerce Hoover, sojourning in Southern California, addressed the exposition by radio. His speech was radiocast from KPO, the studio of Hale Bros. department store. The studio was shifted to the Civic Auditorium, the scene of the exposition. Three complete transmitters were installed at the show by the U. S. Navy. Lectures by prominent radio men from every section of the country also were features of the event.

The exposition marked an experiment in trade co-operative work in the radio field on a larger scale than ever before attempted. The Pacific Radio Trade Association, which is the leading organization of the radio industry on the Pacific Coast, undertook to run the first trade co-operative non-profit radio show on record. The experiment has been a remarkable success. Over 150 booths were reserved by leading radio manufacturers from every section of the country. The show, held in the largest exposition hall in the city, guaranteed 50 per cent of the net profit disbursement to the exhibitors who had booths at the show.

A train known as the Pacific Radio Convention Special left Grand Central Station, New York City, on Sunday morning, August 10. The route traversed included Albany, Schenectady, Buffalo, Cleveland, Toledo and Chicago, whence it was operated by the Chicago & Northwestern Railway in connection with its "San Francisco Overland Limited."

The executive committee in charge of the show was headed by A. S. Lindstrom, P. L. Jensen, H. W. Dickow, E. J. Cramm, C. C. Langevin and W. P. Bear.

PATENTS

1,485,773—Lloyd Espenschied, Queens, New York, assignor to American Telephone and Telegraph Co., New York.—Relates to methods and means for maintaining communication between two radio stations, and in particular to methods and means for calling or signaling the operator

at a remote station. Its object is to permit convenient and reliable calling of such stations. A further object is to provide an arrangement for this purpose which will not require the constant personal attention of an operator.

Coming Events

SEPT. 22-28—First Annual International Radio Show, Madison Square Garden, New York City.

OCT. 2-11—Exposition, Grand Central Palace, New York City, under auspices of American Radio Exposition Co.

NOV. 3-8—Third Annual National Radio Show, Grand Central Palace. S. L. Kothafel (Roxy) and "his gang" will radiocast from the convention.

NOV. 24 TO 30, INCLUSIVE—International Radio Week.

DEC. 1 TO 6, INCLUSIVE—Boston Radio Exposition, Mechanics Building, Boston.

DX WEATHER NEAR, TO EVERY RADIO FAN'S SATISFACTION

TOWARD the end of this month the sun moves south and DX weather edges forward. This is the sort of weather radio fans want. It is hard to find any bona fide exception. Conversationally some folks care "not even that" about DX reception. They snap their fingers. Locals suffice. But at night you will find them at the dials—if not now, a little later—on a DX hunting expedition. New radio fans, so soon as they have brought in all the locals a few times, get the DX fever. You cannot get consistent and satisfactory DX without one or two stages of radio-frequency amplification. The problem is not so much to bring in the station but to do so with good quality and audibility.

Low Loss

Parts increase quality and distance. You can convert your present variable condensers and variocouplers into the low-loss type very easily and without any expense.

How this is done is explained by Dennis J. O'Flaherty in RADIO WORLD, issue of July 5, 1924, in an illustrated article, "Avoiding Losses Due to Insulation."

If you want to make an entire variocoupler yourself you will find it easy by following directions given by Byrt C. Caldwell in his illustrated article, "A Low-Loss Tuning Coil," in the August 2 issue. 15c a copy. Order both today, 30c. Or start subscription with either number. Radio World, 1493 Broadway, N. Y. C.

THE 3-TUBE SUPER-HETERODYNE by A. F. Lapiere, consulting engineer. It functions without any detector. Complete construction article, with diagrams, in Radio World, issue of Aug. 9. Send 15 cents for a copy or start your subscription with that number. Radio World, 1493 Broadway, N. Y. C.

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

Adden's, Inc. (dealer), Mullins, S. C.
Geo. F. Reeves, 817 W. Division St., Springfield, Mo.
R. D. Hay, 109 Clarindia St., San Francisco.
Acme Radio Service, 144 West 4th St., New York City.
Homer Schuckman, 101 Industry St., Pittsburgh, Pa.
Thos. P. J. Shannon, 314 North Alamo Ave., Bell, Cal.
James McDaniel, 402 Main St., Zanesville, O.
E. R. Ulsh, 150 East Seneca St., Des Moines, Iowa.
George A. Dean, P. O. Box 931, Cincinnati, O.
James Fulton, Box 201, Tacoma, Wash.
H. F. Doty, 5242A Waterman Ave., St. Louis, Mo.
Fred C. Rogel, 551 East 7th St., South Boston, Mass.
E. S. Doerfler, 103 Tennessee Ave., Long Beach, N. Y.
Forrest Thompson, Sheldon, Mo.
Lester G. Wilson, 74 Court St., West Haven, Conn.
Russell Gist, Hilt, Cal.
G. Stein, 10 Ardale St., Roslindale, Mass.
Wm. Heinke, 1356 Avenue A, New York City.
Bernard Harris, Box 74, Harris, N. Y.
Edward Regula, 70 Lasalle St., New Britain, Conn.

New Corporations

Big 3 Radio Corp., New York City, \$25,000; A. J. Clap, M. and E. Baraban, Attorney, L. B. Scheiber, 51 Chambers St.
Marks & Harris Radio Co., New York City, \$5,000; L. Marks, R. Harris, Attorney, C. Goldstein, 1476 Broadway.
Bronx Radio Cabinet Co., New York City, \$15,000; C. C. Bryant, M. J. Connery, Attorney, H. E. Skinner, 253 Broadway.

Business Opportunities Radio and Electrical

Rates! 40c a line; Minimum 3 lines.

AFTER 12 YEARS OF DEVOTION TO THE perfection of an industrial chemical process, re-producing precious historic art products in their own original materials, for a popular price, revolutionizing the manufacture of phonograph-radio cabinets and period furniture, by-products give beautiful artistic toys, properties for theatricals and window dressing; I find myself needing additional capital; I invite gentleman with \$50,000, of which only small part will be used; replies must contain details of person answering. Box 546, 1432 Broadway, Brooklyn.

METAL DEVICES MANUFACTURED, stampings, screw machine products, assembling; send samples for quotations. Kings Mfg. Co., Bush Terminal, Brooklyn, N. Y.

AUTOMOBILE SUPPLIES, TIRES, RADIO and electric supply business, doing good business; owners want to retire and sell as going business; rent reasonable. Chas. Scharff Sons, 1324 Myrtle Ave., Brooklyn, N. Y.

IS IT SOUND—TECHNICALLY?

The invention or manufacturing plant you are considering for investment; get unbiased investigation by our experienced engineers; low cost; confidential. Technical Consulting Service, 145 West 45th St., N. Y. C. Tel. Bryant 1995.

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

2-Way Talk with Aviator a Mile Up

First Experiment of Its Kind a Success as Flier in Plane Converses with Group Who Operate from Knoll in Central Park, New York City

AN observer in an airplane from Mitchel Field, flying a mile above New York City, talked to radio experimenters on the ground in Central Park and they in turn talked to him, the complete conversation being radiocast to radio fans, who said they heard it perfectly. This had never been done before.

The field station for the test was set up atop a little knoll in the Park. Antennae were strung between the trees. The apparatus in the field consisted of a Super-Heterodyne receiver, a remote control amplifier panel and a set of batteries.

Radio signals that came from the airplane were received on the antennae, amplified on the field and sent three miles by wire into the control room of Station WJZ in Aeolian Hall. There they were amplified and modulated, then sent to the transmitter room, whence they were radiocast with 500-watt power.

The De Haviland plane from Mitchel Field was equipped with the new type Signal Corps transmitter which has been developed by the General Electric Company after experiment at Camp Vail. It operated on about 50-watt power. Both the field set and the airplane set operated at a wavelength of 330 meters and retransmitted on a 455-meter wave.

The test was pronounced a complete success by the Radio Corporation of America. A staff reporter for RADIO WORLD on the field, who listened in with a headpiece for a time, could plainly hear the voice of the aviator and his responses to remarks addressed to him from the ground. Outside listeners also reported they had heard the whole conversation perfectly.

11 Stations Used As Wavelength Guide

WASHINGTON.

THE Bureau of Standards radio experts have designated WBZ, at Springfield, Mass., as the eleventh standard wave station. The stations so listed have been found to transmit at sufficiently constant frequencies to be useful to other radiocasters and fans in checking up their wave meters; none of them vary more than 2 kilo cycles from the assigned frequencies or wavelengths.

The Westinghouse station, WBZ, at Springfield, is exceptional in that no variance from its assigned frequency of 890 kilocycles has been noted in nine tests between May 1 and July 16. The other eleven standard wave stations and their waves in kilocycles are:

WBZ, Springfield, Mass.	890.
NSS, Annapolis	17.50
WGG, Tuckerton, N. J.	18.85
WII, New Brunswick, N. J.	22.04
WSO, Marion, Mass.	25.80
WWJ, Detroit, Mich.	580.
WCAP, Washington, D. C.	640.
WRC, Washington, D. C.	640.
WSB, Atlanta, Ga.	700.
WGY, Schenectady	790.
KDKA, E. Pittsburgh, Pa.	920.

[An easy way to construct a wave meter will be fully explained, in diagrams and text, in RADIO WORLD next week, issue of August 30, on sale August 27.]

Shipping Board Asks License for Leviathan to Radiocast Programs

WASHINGTON.

THE U.S.S. Leviathan is the first floating radiocasting station. It is not officially licensed to radiocast, but is operating on an experimental license with the call WSN and the Shipping Board has applied to the Department of Commerce for permission to radiocast while at sea.

During a recent trip to Europe, the Leviathan sent out several concerts by this ship's famous band and the artists aboard. These concerts were picked up by several ships which reported them with thanks. A station of the British Broadcasting Co. also intercepted the concerts and re-radiocast them from the company stations in England resulting in many letters of appreciation from British fans who enjoyed the artists aboard the ship.

Officials of the Shipping Board said that while the radiocasting was not established permanently, the trials had proved that transmitting concerts at sea was practical and appreciated by thousands of persons out of range of most land stations and other means of amusements.

The Leviathan is especially well adapted to radiocast concerts without undue interference with its regular commercial traffic and SOS calls. This is due to ultra-modern radio equipment, especially a device invented by a naval radio expert which permits multiple reception on a single aerial. The large fighting craft of the United States are now equipped, or being equipped, with this apparatus, known in the Navy as the "coupling tube unit," but recently named the "Unitenna" in its commercial application ashore.

Recent tests on the Leviathan proved that with the coupling tube unit messages could be received on 600 meters while the ship's 6KW-tube transmitter was radiating 25 amperes on 2100 meters. The transmitting tube was located only five feet from the receiving set in the tests, the antennas were parallel and only thirty feet apart. This indicates practical operation in duplex, which will aid in speeding traffic, as it permits reception and transmission at the same time.

The selectivity of the receivers operating with the coupling unit was also demonstrated. WOO came in strong on 506 meters, while the ship was in New York harbor only a half mile from WEAJ which

was transmitting on 492 meters. With this device the ship's receiving set picked up eastern-coast broadcasting stations of the United States, while the Leviathan was ly-



(Kadel & Herbert)

SCENE ABOARD THE LEVIATHAN during the radiocasting of a concert. At the particular moment an announcement is being made. Note the microphone hanging in front of the decorative life-preserver. T. H. Rosshottom, general manager of the U. S. Shipping Board lines, is talking. Next to him, seated, is Commissioner E. C. Plummer. Capt. Herbert Hartley of the Leviathan is sitting next to him and standing between them is E. E. McNary. Commissioner Meyer Lissner, of California, is seated at the extreme right

ing at Cherbourg, France. Improvements by locating the receiving sets at a greater distance from the ship's transmitters, and improvements in receivers and amplifiers are planned.

The Shipping Board is also planning to install the coupling tube sets on the America, the George Washington and the Republic.

Coolidge Tests Talking Movies

WASHINGTON.

PRESIDENT COOLIDGE will be seen talking his campaign speeches over the radio if the De Forest invention which synchronizes the radio voice with the motion picture of a speaker proves successful. A test of the machine was made in the White House, and if President Coolidge reports success he will use the device.

S-U-P-E-R-D-Y-N-E SPECIALISTS

Our Own Coils—guaranteed. Coils and Dia. Kit (Flowelling Condensers, Coils and Dia. gram) \$6.50
 Complete Parts, Assembled with Diagram \$9.50
 Superdyne Advice Free. Mail Orders Solicited.
WALLACE RADIO COMPANY, Inc.
 135 LIBERTY STREET NEW YORK CITY

Pacific Exposition Sets Record

The Radio Trade

Exhibit Held on Stupendous Scale

THE highest record ever reached by a radio exposition on the West Coast was achieved at the Pacific Radio Exposition here, under the auspices of the Pacific Radio Trade Association. The stupendous scale on which it was conducted during the six days that it ran, the splendid appointment of the exhibits, the artistic effect achieved and the large attendance indelibly stamped the event with a firm imprint of success.

The committee headed by A. S. Lindstrom made all arrangements for the success of the event. The opening day was marked by a street parade representing the radio interests and more than 200 decorated automobiles were in the line of march through the principal streets of the city.

Secretary of Commerce Hoover, sojourning in Southern California, addressed the exposition by radio. His speech was radio-cast from KPO, the studio of Hale Bros. department store. The studio was shifted to the Civic Auditorium, the scene of the exposition. Three complete transmitters were installed at the show by the U. S. Navy. Lectures by prominent radio men from every section of the country also were features of the event.

The exposition marked an experiment in trade co-operative work in the radio field on a larger scale than ever before attempted. The Pacific Radio Trade Association, which is the leading organization of the radio industry on the Pacific Coast, undertook to run the first trade co-operative non-profit radio show on record. The experiment has been a remarkable success. Over 150 booths were reserved by leading radio manufacturers from every section of the country. The show, held in the largest exposition hall in the city, guaranteed 50 per cent of the net profit disbursement to the exhibitors who had booths at the show.

A train known as the Pacific Radio Convention Special left Grand Central Station, New York City, on Sunday morning, August 10. The route traversed included Albany, Schenectady, Buffalo, Cleveland, Toledo and Chicago, whence it was operated by the Chicago & Northwestern Railway in connection with its "San Francisco Overland Limited."

The executive committee in charge of the show was headed by A. S. Lindstrom, P. L. Jensen, H. W. Dickow, E. J. Cramm, C. C. Langevin and W. P. Bear.

PATENTS

1,485,773—Lloyd Espenschied, Queens, New York, assignor to American Telephone and Telegraph Co., New York.—Relates to methods and means for maintaining communication between two radio stations, and in particular to methods and means for calling or signaling the operator

at a remote station. Its object is to permit convenient and reliable calling of such stations. A further object is to provide an arrangement for this purpose which will not require the constant personal attention of an operator.

Coming Events

SEPT. 22-28—First Annual International Radio Show, Madison Square Garden, New York City.

OCT. 2-11—Exposition, Grand Central Palace, New York City, under auspices of American Radio Exposition Co.

NOV. 3-8—Third Annual National Radio Show, Grand Central Palace. S. L. Rothafel (Roxy) and "his gang" will radiocast from the convention.

NOV. 24 TO 30, INCLUSIVE—International Radio Week.

DEC. 1 TO 6, INCLUSIVE—Boston Radio Exposition, Mechanics Building, Boston.

DX WEATHER NEAR, TO EVERY RADIO FAN'S SATISFACTION

TOWARD the end of this month the sun moves south and DX weather edges forward. This is the sort of weather radio fans want. It is hard to find any bona fide exception. Conversationally some folks care "not even that" about DX reception. They snap their fingers. Locals suffice. But at night you will find them at the dials—if not now, a little later—on a DX hunting expedition. New radio fans, so soon as they have brought in all the locals a few times, get the DX fever. You cannot get consistent and satisfactory DX without one or two stages of radio-frequency amplification. The problem is not so much to bring in the station but to do so with good quality and audibility.

Low Loss

Parts increase quality and distance. You can convert your present variable condensers and variocouplers into the low-loss type very easily and without any expense.

How this is done is explained by Dennis J. O'Flaherty in RADIO WORLD, issue of July 5, 1924, in an illustrated article, "Avoiding Losses Due to Insulation."

If you want to make an entire variocoupler yourself you will find it easy by following directions given by Byrt C. Caldwell in his illustrated article, "A Low-Loss Tuning Coil," in the August 2 issue. 15c a copy. Order both today, 30c. Or start subscription with either number. Radio World, 1493 Broadway, N. Y. C.

THE 3-TUBE SUPER-HETERODYNE by A. F. Lapiere, consulting engineer. It functions without any detector. Complete construction article, with diagrams, in Radio World, issue of Aug. 9. Send 15 cents for a copy or start your subscription with that number. Radio World, 1493 Broadway, N. Y. C.

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

Adden's, Inc. (dealer), Mullins, S. C. Geo. F. Reeves, 817 W. Division St., Springfield, Mo.

R. D. Hay, 109 Clarindia St., San Francisco. Acme Radio Service, 144 West 4th St., New York City.

Homer Schuckman, 101 Industry St., Pittsburgh, Pa.

Thos. P. J. Shannon, 314 North Alamo Ave., Bell, Cal.

James McDaniel, 402 Main St., Zanesville, O. E. R. Ulsh, 150 East Seneca St., Des Moines, Iowa.

George A. Dean, P. O. Box 931, Cincinnati, O. James Fulton, Box 201, Tacoma, Wash.

H. F. Doty, 5242A Waterman Ave., St. Louis, Mo.

Fred C. Rogel, 551 East 7th St., South Boston, Mass.

E. S. Doerfler, 103 Tennessee Ave., Long Beach, N. Y.

Forrest Thompson, Sheldon, Mo. Lester G. Wilson, 74 Court St., West Haven, Conn.

Russell Gist, Hilt, Cal.

G. Stein, 10 Ardale St., Roslindale, Mass.

Wm. Heinke, 1356 Avenue A, New York City. Bernard Harris, Box 74, Harris, N. Y.

Edward Regula, 70 Lasalle St., New Britain, Conn.

New Corporations

Big 3 Radio Corp., New York City, \$25,000; A. J. Clap, M. and E. Baraban, Attorney, I. B. Scheiber, 51 Chambers St.

Marks & Harris Radio Co., New York City, \$5,000; L. Marks, R. Harris, Attorney, C. Goldstein, 1476 Broadway.

Bronx Radio Cabinet Co., New York City, \$15,000; C. C. Bryant, M. J. Connery, Attorney, H. E. Skinner, 253 Broadway

Business Opportunities Radio and Electrical

Rates: 40c a line; Minimum 3 lines.

AFTER 12 YEARS OF DEVOTION TO THE perfection of an industrial chemical process, re-producing precious historic art products in their own original materials, for a popular price, revolutionizing the manufacture of phonograph-radio cabinets and period furniture, by-products give beautiful artistic toys, properties for theatricals and window dressing; I find myself needing additional capital; I invite gentleman with \$50,000, of which only small part will be used; replies must contain details of person answering. Box 546, 1432 Broadway, Brooklyn.

METAL DEVICES MANUFACTURED, stampings, screw machine products, assembling; send samples for quotations. Kings Mfg. Co., Bush Terminal, Brooklyn, N. Y.

AUTOMOBILE SUPPLIES, TIRES, RADIO and electric supply business, doing good business; owners want to retire and sell as going business; rent reasonable. Chas. Scharff Sons, 1324 Myrtle Ave., Brooklyn, N. Y.

IS IT SOUND—TECHNICALLY?

The invention or manufacturing plant you are considering for investment; get unbiased investigation by our experienced engineers; low cost; confidential. Technical Consulting Service, 145 West 45th St., N. Y. C. Tel. Bryant 1995.

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

2-Way Talk with Aviator a Mile Up

First Experiment of Its Kind a Success as Flier in Plane Converses with Group Who Operate from Knoll in Central Park, New York City

AN observer in an airplane from Mitchel Field, flying a mile above New York City, talked to radio experimenters on the ground in Central Park and they in turn talked to him, the complete conversation being radiocast to radio fans, who said they heard it perfectly. This had never been done before.

The field station for the test was set up atop a little knoll in the Park. Antennae were strung between the trees. The apparatus in the field consisted of a Super-Heterodyne receiver, a remote control amplifier panel and a set of batteries.

Radio signals that came from the airplane were received on the antennae, amplified on the field and sent three miles by wire into the control room of Station WJZ in Aeolian Hall. There they were amplified and modulated, then sent to the transmitter room, whence they were radiocast with 500-watt power.

The De Haviland plane from Mitchel Field was equipped with the new type Signal Corps transmitter which has been developed by the General Electric Company after experiment at Camp Vail. It operated on about 50-watt power. Both the field set and the airplane set operated at a wavelength of 330 meters and retransmitted on a 455-meter wave.

The test was pronounced a complete success by the Radio Corporation of America. A staff reporter for RADIO WORLD on the field, who listened in with a headpiece for a time, could plainly hear the voice of the aviator and his responses to remarks addressed to him from the ground. Outside listeners also reported they had heard the whole conversation perfectly.

11 Stations Used As Wavelength Guide

WASHINGTON.

THE Bureau of Standards radio experts have designated WBZ, at Springfield, Mass., as the eleventh standard wave station. The stations so listed have been found to transmit at sufficiently constant frequencies to be useful to other radiocasters and fans in checking up their wave meters; none of them vary more than 2 kilo cycles from the assigned frequencies or wavelengths.

The Westinghouse station, WBZ, at Springfield, is exceptional in that no variance from its assigned frequency of 890 kilocycles has been noted in nine tests between May 1 and July 16. The other eleven standard wave stations and their waves in kilocycles are:

WBZ, Springfield, Mass.	890.
NSS, Annapolis	17.50
WGG, Tuckerton, N. J.	18.85
WII, New Brunswick, N. J.	22.04
WSO, Marion, Mass.	25.80
WWJ, Detroit, Mich.	580.
WCAP, Washington, D. C.	640.
WRC, Washington, D. C.	640.
WSB, Atlanta, Ga.	700.
WGY, Schenectady	790.
KDKA, E. Pittsburgh, Pa.	920.

[An easy way to construct a wave meter will be fully explained, in diagrams and text, in RADIO WORLD next week, issue of August 30, on sale August 27.]

Shipping Board Asks License for Leviathan to Radiocast Programs

WASHINGTON.

THE U.S.S. Leviathan is the first floating radiocasting station. It is not officially licensed to radiocast, but is operating on an experimental license with the call WSN and the Shipping Board has applied to the Department of Commerce for permission to radiocast while at sea.

During a recent trip to Europe, the Leviathan sent out several concerts by this ship's famous band and the artists aboard. These concerts were picked up by several ships which reported them with thanks. A station of the British Broadcasting Co. also intercepted the concerts and re-radiocast them from the company stations in England resulting in many letters of appreciation from British fans who enjoyed the artists aboard the ship.

Officials of the Shipping Board said that while the radiocasting was not established permanently, the trials had proved that transmitting concerts at sea was practical and appreciated by thousands of persons out of range of most land stations and other means of amusements.

The Leviathan is especially well adapted to radiocast concerts without undue interference with its regular commercial traffic and SOS calls. This is due to ultra-modern radio equipment, especially a device invented by a naval radio expert which permits multiple reception on a single aerial. The large fighting craft of the United States are now equipped, or being equipped, with this apparatus, known in the Navy as the "coupling tube unit," but recently named the "Unitenna" in its commercial application ashore.

Recent tests on the Leviathan proved that with the coupling tube unit messages could be received on 600 meters while the ship's 6KW-tube transmitter was radiating 25 amperes on 2100 meters. The transmitting tube was located only five feet from the receiving set in the tests, the antennas were parallel and only thirty feet apart. This indicates practical operation in duplex, which will aid in speeding traffic, as it permits reception and transmission at the same time.

The selectivity of the receivers operating with the coupling unit was also demonstrated. WOO came in strong on 506 meters, while the ship was in New York harbor only a half mile from WEAF which

was transmitting on 492 meters. With this device the ship's receiving set picked up eastern-coast broadcasting stations of the United States, while the Leviathan was ly-



(Kadel & Herbert)

SCENE ABOARD THE LEVIATHAN during the radiocasting of a concert. At the particular moment an announcement is being made. Note the microphone hanging in front of the decorative life-preserver. T. H. Rossbottom, general manager of the U. S. Shipping Board lines, is talking. Next to him, seated, is Commissioner E. C. Plummer. Capt. Herbert Hartley of the Leviathan is sitting next to him and standing between them is E. E. McNary. Commissioner Meyer Lissner, of California, is seated at the extreme right

ing at Cherbourg, France. Improvements by locating the receiving sets at a greater distance from the ship's transmitters, and improvements in receivers and amplifiers are planned.

The Shipping Board is also planning to install the coupling tube sets on the America, the George Washington and the Republic.

Coolidge Tests Talking Movies

WASHINGTON.

PRESIDENT COOLIDGE will be seen talking his campaign speeches over the radio if the De Forest invention which synchronizes the radio voice with the motion picture of a speaker proves successful. A test of the machine was made in the White House, and if President Coolidge reports success he will use the device.

S-U-P-E-R-D-Y-N-E SPECIALISTS

Our Own Coils—guaranteed..... \$6.50
 Kit (Fluwellling Condensers, Coils and Dia-gram)..... 19.50
 Complete Parts, Assembled with Diagram... \$8.00
 Superdyne Advice Free. Mail Orders Solicited.
WALLACE RADIO COMPANY, Inc.
 135 LIBERTY STREET NEW YORK CITY

WGR'S SIGNALS GO HALF WAY ROUND WORLD

Station WGR, owned and operated by Federal Telephone & Telegraph Company, Buffalo, N. Y., transmitted both voice and music practically half way around the earth, 11,706 miles airline, when W. J. Bland of Butter Terrace, Alberton, South Australia, operating 5-A. G., and Clement E. Ames, Secretary of the 8th Australian Division of the Wireless Institute, heard station call letters WGR, also a violin trio.

STILL FAR BEHIND

THE radio is still far behind the grade-crossing as a means of establishing contact with the infinite.—Life.

RADIO MAP FREE

Big Broadcasting Station List. Also Radio Bargain List. Just Out.
The RADIO SHACK
 America's Largest Radio Dealers
 Dept. RW. 8-23
 55 Vesey St. New York

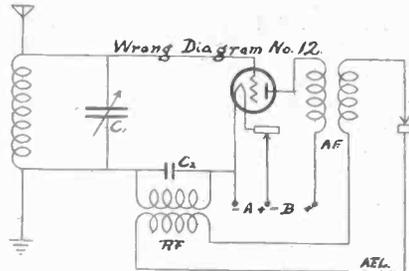
"RADECO FOR SECURITY"
 RADECO SAFETY FUSES 50 CENTS EACH
 At Your Dealers or by Mail, Postpaid
 RADIO EQUIPMENT CO., 20 Stuart St., Boston

COAST TO COAST
 Every Turn **STAR** No Soldering
 A Tap **COIL**
 SEND FOR LITERATURE
STAR RADIO PRODUCTS CO.
 711 S. DEARBORN ST. CHICAGO, ILL.

ACH SHARP TUNER
 DIFFICULT TUNING MADE EASY
 Why the A.C.H. is different
 3 in. DIAL \$2.50 (150-10-1)
 4 in. DIAL \$5.00 (210-10-1)
 5/16 REC. 1/4" 3/16 BUSHINGS 5¢ EACH
 Send for Circular D
A. C. Hayden Radio & Research Co.
 Brockton, Mass., U. S. A.

WHAT'S WRONG HERE?

THE wiring in the accompanying diagram is wrong. If you find what you think is the error, write to Wrong Diagram



Editor, RADIO WORLD, 1493 Broadway, New York City. Mention Wrong Diagram No. 12. The names and addresses of those sending in the right answer will be published.

WRONG DIAGRAM NO. 9

Christopher Albach, 469 East 136th St., N. Y. C.
 Charles Marks, 106 South Market St., Selmsgrove, Pa.

WRONG DIAGRAM NO. 10

John A. Rose, 190 West End Ave., N. Y. C.
 Douglas Sprinchorn, 166 Baker St., Jamestown, N. Y.
 F. L. Tracy, 469 East 136th St., Bronx, N. Y.
 H. B. Couch, 109 West 6th Ave., Topeka, Kan.
 John C. Davis, 1430 Geyer Ave., S. Pittsburgh, Pa.
 James Robbins, 81 Third Ave., N. Y. C.
 Frederick H. Schawe, 462 East 136th St., N. Y. C.
 Bertram Schindler, Box 293, R 30, St. Louis, Mo.

WRONG DIAGRAM NO. 11

Robert H. Layman, 102 West 6th St., Bloomington, Ind.
 Frank Bowden, 6190 St. Charles Ave., Montreal, Can.
 John A. Rose, 32 West 40th St., New York City.
 Max Weinman, 102 34 Van Wyck Ave., Jamaica, N. Y.

Set Works Without Any Aerial

(Concluded from page 12)

with one rheostat, thereby eliminating two controls.

Some question may arise relative to the value of the potentiometer required for use with dry cell A batteries. A poten-

"Can't Lose 'Em"

 Bakelite, Engraved, Nickel-plated with lugs
 Panels Cut, Drilled, Engraved
 Dealers Write for Terms
CORTLANDT PANEL ENGRAVING CO.
 31 Cortlandt Street New York City

tiometer of approximately 1,800 ohms should be used.

For local reception no ground or antenna should be used, as the energy received on the inductance alone is sufficient. Under very favorable conditions, stations up to 100 miles distance have been clearly heard on headphones, no ground or aerial being used.

With ground alone this distance may be doubled, except when receiving conditions are very poor. When using both antenna and ground, very satisfactory DX reception may be had.

Federal Standard RADIO Products
 Over 130 standard radio parts, each bearing the Federal Iron-clad performance guarantee.
 Write for Catalog.
FEDERAL TELEPHONE & TELEGRAPH CO.
 Buffalo, N. Y.

Record Your Radio Stations
 On RADEX Log Cards to Match Your Set

 Copyright 1924 by S. T. Aston & Son
 Telephone FRANKLIN 2159
 100 Cards, Mahogany Finish or Oak Cabinet, and Index Dividers, Complete, \$3.00. A Useful Accessory to Any Set. Give Name of Your Set or Sketch of Dial Arrangement. Sent Postpaid on Receipt of Cash or Money Order.
S. T. ASTON & SON
 114 WORTH STREET NEW YORK CITY

Dealers Need This

Profit 200%
 The new **FAHNESTOCK Display Case**
 Will stimulate your sales of Fahnestock Radio Products. 14 of the most popular styles and sizes are included. Shows the purchaser instantly the correct piece for his set. A constant invitation to buy Fahnestock Products. Dealers are offered 200% profit on each case, an unusual offer on standard merchandise.
 Price to Dealer.....\$17.50
 West of Mississippi..... 18.50
 Transportation prepaid when money order or check accompanies order.
 Subsequent orders at regular price of \$20.00.
 Contents Retail for \$51.50
 Refills will be supplied at the regular 100 lot prices, shown in catalogue, which comes with case, less discount shown on enclosed sheet. Send check or money order, today.
FAHNESTOCK ELEC. CO.
 LONG ISLAND CITY NEW YORK

FILL OUT AND MAIL NOW

SUBSCRIPTION BLANK

RADIO WORLD

RADIO WORLD

1493 Broadway, New York City

Please send me RADIO WORLD for.....months, for which

please find enclosed \$.....

SUBSCRIPTION RATES:

Single Copy	\$.15
Three Months	1.50
Six Months	3.00
One Year, 52 Issues.....	6.00
Add \$1.00 a Year to Foreign Postage; 50c for Canadian Postage.	

"GET HASTINGS, NEB."

We Will Mail Free the Hook-up of

"Killoch Kilo Koupler"

Most Wonderful Coil

A CIRCUIT WELL WORTH WHILE!
 Build a two-tube set, one stage of R. F., using neodyne principle and detector. Full details in Radio World, Issue April 12. Send 15 cents.

David Killoch Company

Dodge Building, 45 West Broadway
 Corner Park Place, New York City

Join the A. B. C. NOW

THE American Broadcast Club, formed under the auspices of RADIO WORLD, has for its object the promotion of the welfare of the broadcast listeners of the United States, Canada and Mexico.

Membership is open to all interested in radio in any way, either as broadcast listener, dealer, manufacturer, wholesaler or jobber.

A novel feature of the A. B. C. is that membership entails no duties or obligations whatever. There are no dues. All you have to do is enroll. That will signify your interest in radio and make you one of the thousands unselfishly united in a common interest.

NEW MEMBERS

- Wade Knapp, Elliot St., Fremont, O.
- H. Silverman, 28 Gouverneur St., New York City.
- Terence J. McNamara, 1114 Campbell St., Detroit, Mich.
- William L. Welch, Y. M. C. A. Bldg., Nashville, Tenn.
- Robert West, 530 32nd St., Oakland, Cal.
- Wm. H. Stout, 1628 Third Ave., New York City.
- Daniel Durrroughs, 72 West 108th St., New York City.
- R. L. Layman, Twentieth and Selby Sts., Marion, Ind.
- J. G. Womble, Box 265, Rutherfordton, N. C.
- Charles A. Pirson, 54 Fairchild Place, Buffalo, N. Y.
- Charles W. Moser, Jr., 310 Penn St., Huntingdon, Pa.
- D. H. Meader, 26 Winthrop St., Hallowell, Me.
- Robert Layman, 702 West 10th St., Bloomington, Ind.
- Al Thornquist, Long Siding, Minn.
- J. C. Davis, 1430 Geyer Ave., N. S., Pittsburgh, Pa.
- H. L. Gilfoy, 811 South 56th St., West Philadelphia, Pa.
- James E. Grayson, P. O. Box 972, Gallup, N. M.
- Frank Bowden, 6190 St. Charles Ave., Montreal, Canada.
- Floyd W. Rausch, R. R. No. 4, Milan, Mich.
- H. Cliff, 124 Stone Ave., Brooklyn, N. Y.
- Otto Eppers, Box 324, Clearfield, Pa.
- George F. Stein, 10 Ardale St., Roslindale, Mass.
- Lester G. Wilson, 74 Court St., West Haven, Conn.
- Archie Charlion, Box 662, Barnesboro, Pa.
- Geo. A. Dean, P. O. Box 931, Cincinnati, O.
- Irwin C. Dietze, 136 S. Griffin Ave., Los Angeles, Cal.
- Donald Wulliver, Holland St., Fremont, O.
- James D. Caborn, Jr., 200 Elliott St., Fremont, Ohio.
- Geo. G. Chandler, 302 Brachell St., Portland, Maine.
- Guy C. Latimer, 709 Monroe St., Kansas City, Missouri.
- Chas. H. Hauptman, 15 Winnemay St., Natick, Mass.
- George Weiss, 2005 Vine St., Cincinnati, O.
- Edward Hooker, 5673 Waterman St., St. Louis, Mo.
- Mr. and Mrs. H. L. Hutchinson, 123 E. Orange St., Gainesville, Fla.

INVALID APPRECIATES RADIO

A RADIO prescription is putting S. R. Helms, of Monroe, N. C., back on his feet after an invalidism of over fourteen months. Writing to WGY recently, he said: "I am one patient that an M. D. prescribed a radio outfit for and it was the greatest prescription he ever made, as it has done me more good than specialists and sanatoriums. I sincerely wish that every shut-in could have a radio set."

IS YOUR NEUT RIGHT?

To revitalize unneutralizable Neutrodyne, we devised this Kladag Coast-to-Coast Circuit. Uses same panel, etc., as Neut, except three less parts. Merely rewire. Success certain. Necessary stabilizer, 23 feet gold sheathed wire, circuit and complete, simple instructions—\$5.00 prepaid. Many have already rebuilt their Neuts—and written wonderful testimonials. Thousands will do it. Be FIRST—have the finest five tube set in your neighborhood, revitalize others' Neuts. Description, etc.—10c. Radio Lists—3c. Stamps accepted.

KLADAG LABORATORIES, Kent, Ohio

PRE-AMPLIFIER

A Radio Frequency Amplifier of TREMENDOUS POWER. Sets distance, volume, less static. Attachable to any receiving set. Price complete with tube, \$25.00. Send for Circular

S. A. TWITCHELL
1930 Western Avenue Minneapolis, Minn.

BRISTOL AUDIOPHONE

MORE THAN A LOUD SPEAKER
Bristol Audiophone, Sr., 15-in. Horn. \$30.00
Bristol Audiophone, Jr., 11-in. Horn. \$22.50
Bristol Single Stage Power Amplifier. \$25.00

Write for Bulletin 3006-W
The Bristol Company
Waterbury, Conn.

HENLEY'S 222 RADIO CIRCUIT DESIGNS—A fine book for the novice and the expert. Mailed on receipt of \$1.00. The Columbia Print, 1493 Broadway, New York City.

A. B. C. Editor, RADIO WORLD,
1493 Broadway, New York City.

Please enroll me as a member of the American Broadcast Club.

Name
Address
City or Town.....
State

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 neutrodyne. Every part included even to screws and wire. Easy read plans.

Send No Money Order by postcard
Pay the postman
RADIO SURPLUS STORES
HELENA MONTANA

CROSLEY RADIO CATALOG FREE

Describes fully the complete line of radio frequency sets, regener-
tive sets (licensed under Armstrong U. S. Patent
No. 1,113,749) and parts.

Write for Catalog Today
THE CROSLEY RADIO CORPORATION
POWEL CROSLEY Jr., President
6401 Alfred Street Cincinnati, Ohio

NEW TUBES

MANUFACTURERS' SALE

Price, \$2.25 each

All Types—All Guaranteed

Send No Money—Pay Postman

WALTER SCOTT & CO.

636 HIGHLAND AVE., NEWARK, N. J.

"ROLLS ROYCE"

RADIO TUBES



Like their name, significant of quality, Durable and powerful. Bring in distance with a maximum of volume and clearness.

Type 200—5 volts, 1 ampere Detector Tube

Type 201A—5 volts, .25 amperes Amplifier and Detector

Type 199—3-4 volts, .06 amperes Amplifier and Detector

Type 198—3-4 volts, .06 amperes With Standard Base—Amplifier and Detector

Type 12—1 1/2 volts, .25 amperes Platinum Filament—Amplifier and Detector

ALL TYPES \$2.50 of Radio Tubes

Type 202 Five (5) Watt Transmitter \$3.00

EVERY TUBE GUARANTEED to work in Radio Frequency. Especially adapted for Neutrodyne, Reflex and Super Heterodyne Sets.

Shipped Parcel Post C. O. D. When ordering mention type.

Rolls Royce Tube Co.

21 Norwood Street Dept. W Newark, N. J.

Monumental Achievements

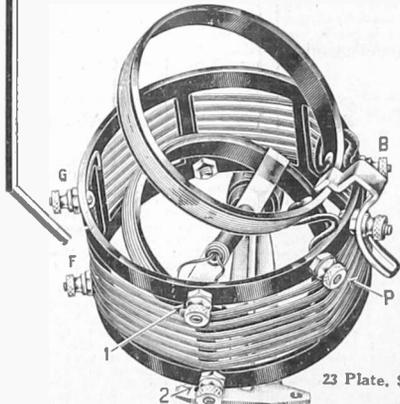
THE New Bremer-Tully Low Loss Tuner The New "Lifetime" Condenser

B-T Spaced series bank winding on coil frame of Bureau of Standards type, gives remarkable selectivity and volume.

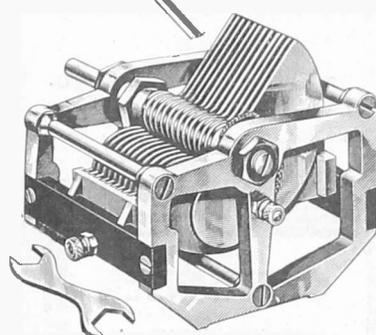
Adjustable untuned primary solves the problem of adapting a tuner to the various types of antennae, circuit requirements, and local receiving conditions without taps.

Adjustable lubricated cone bearing.

Adaptable to any circuit requiring a tuner.



23 Plate, \$5



TWO TYPES

Short Wave, 50 to 150 Meters, Broadcasting 200 to 565 Meters

\$5

These Ranges covered with B-T 11 plate "Lifetime Laboratory Condenser."

Bremer-Tully Laboratory Type Condenser at a commercial price.

LIGHT WEIGHT COMPACT SIZE—LOWEST LOSS

This condenser is the only Low Loss straight line wave length condenser. Adjustable, lubricated bearings, pig-tail connections.

It is Electrically perfect and Mechanically beyond comparison.

Write for "20 point" folder. It gives you the details.

"Better Tuning" (now in 6th Edition) tells you why and shows you how. Send ten cents for copy.

Bremer-Tully, Mfg. Co., 531-S Canal Street, Chicago

M. B. SLEEPER RADIO DESIGN & CONSTRUCTION FOR EXPERIMENTERS, REF. FLEX & RADIO FREQUENCY, \$1.00. The Columbia Print, 1493 Broadway, N. Y. C.

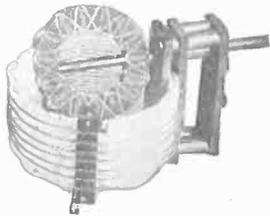
GRAM'S RADIO MAP IN TWO COLORS—Best map on the market. 35c. The Columbia Print, 1493 Broadway, N. Y. C.

ASKS THE QUASHING OF DOHENY INDICTMENT, DUE TO SPEECH WALSH RADIOCAST WASHINGTON.

THE Supreme Court of the District of Columbia was asked to quash the indictments found against Edward L. Doheny and Edward L. Doheny, Jr., for bribery and conspiracy to defraud the Government because Senator Thomas J. Walsh, prosecutor in the Senate oil inquiry, radiocast a speech about the investigation by radio on May 6 while the Grand Jury which later found the indictments was in session.

The contention was made by Frank J. Hogan, chief counsel for the defendants, that several of the members of the Grand Jury might have had radio receiving sets in their homes and probably listened in.

LOW-LOSS TUNERS



The Globe Low-Loss Tuner is designed to give maximum efficiency. All metal parts entirely eliminated. Less than 1½ ozs. of insulating material. Anti-capacity windings. Suitable for use in all standard hook-ups. Special unit for the Superdyne circuit.

PRICES:

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

Circular on request.

Dealers and jobbers write.

Globe Radio Equipment Co.
217 West 125th St., New York

AMPLEX

GRID-DENSER

Increases Range and Power of Any Set!

A turn of its knob gets you the exact capacity necessary for Greatest Distance, Louder and Clearer Signals.

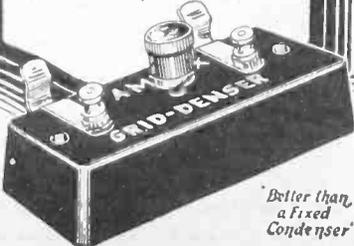
That is why Lapierris, Cockaday, Haynes, Sleeper, Crosby and others specify its use in ALL their circuits.

Whether it's the Super-Hot, Cockaday, Superdyne, Neurodyne or any other—replace your fixed condensers with GRID-DENSERS and see the difference.

In either the .0005 } \$1.25
or .001 type with
or without gridleak }
clips

FREE! Hook-up Booklet.
Dept. 823

AMPLEX INSTRUMENT LABS.
88 W 8th Ave New York NY



*Better than
a fixed
Condenser*

RESULTS

**WHAT Results Did You
Obtain from Con-
structing Sets or Parts Fol-
lowing Data Published in
Radio World? Write to Re-
sults Editor, Radio World,
1493 Broadway, New York
City**

EDITOR, RADIO WORLD:

I AM a regular reader of RADIO WORLD and I wish to thank Dennis J. O'Flaherty for the article, "Reducing Losses Due to Insulation," in the July 5 issue. I followed him in every detail on my 3-tube Reinartz. Now I am getting better results than I did last Winter. Among the most distant stations I have picked up on the loud speaker since the change are KGO and WGY, which are approximately 1,500 miles from Omaha.

GEORGE O. BARTLETT,
578 South 28th Street,
Omaha, Neb.

Stations In the Making

WPG, 349 METERS

ATLANTIC CITY.

WHILE there are three radiocasting stations regularly sending out information about this resort, none of them will approach the city's new plant at the Airport, work on which has been begun. By October 1 City Electrician Frank Shinnen expects to be ready for operating. The station will be known as WPG, or world's playground, and will radiocast on a wavelength of 349 meters, while the transmitter will be of 500 watts.

The studio will be installed on the second floor of the high school, where the microphones will be placed. When the service is fully going all the important convention news will be sent out, as well as information of all that is happening in other spheres in this city. Expectation is that the publicity

GET ON THE REBUS HONOR ROLL!—The names of all those correctly solving Rebusés Nos. 1 to 12 will be placed on the Robus Honor Roll and published in Radio World. Rebusés Nos. 1 to 11 inclusive are published in Radio World, issues of Aug. 9, 16 and 23. Rebus No. 12 will be printed in the Aug. 30 issue. Send 15 cents for each back number desired or start your subscription with that number. Radio World, 1493 Broadway, New York City.

All You Want to Know About Aerials

How An Apartment House Dweller Can Solve His Aerial Problem, if Unable to Erect an Outdoor Antenna. Issue of May 3.
Nineteen Different Types of Aerials, Mostly Outdoor, With a Diagram of Each. Issue of June 28.
Pepping Up Your Aerial for Greater Distance and Volume. Issue of July 5.
Loops. Which Type Is Best and Why. How to Make Different Kinds of Loops and How to Connect Them in Your Set. Issue of July 19.
Send 15c. for a copy of each issue. Address RADIO WORLD, 1493 Broadway, New York City.
All the radio phases of the Republican National Convention and the Democratic National Convention, the first sessions in history in which the choosing of candidates for President and Vice-President were radiocast, published in RADIO WORLD, issues of June 21 and 28 and July 5. You should preserve these numbers as records and mementos of notable events. Send 15c. for a copy of each issue. Or start your subscription with any of these numbers. Address RADIO WORLD, 1493 Broadway, New York

thus given to resort affairs will be looked for all over the country and prove of benefit to the city.

HOTEL MCALPIN, 233 METERS

A NEW radio station will be opened on the roof of the Hotel McAlpin, New York City, within a few days, Arthur L. Lee, managing director, announced. Actual radiocast will be conducted from Newark, where the antenna will be erected, but the studio and reception rooms will be on the twenty-fourth floor of the hotel. Mr. Lee added: "My engineers have gone deeply into the project and we have decided that a wavelength of 233 meters is the most advantageous. This follows the trend toward the lower wavelengths where the richness of the frequencies has been demonstrated by experiments of Marconi and other radio experts, to be greater. Also the static and other forms of interference are less at this wavelength than any other available for use, and in addition we have the distinct advantage of having hours on the air that will appeal not only to the local radio audience but also will allow us to be heard in every section of the United States and Canada."

\$25
FOR
\$10

THE FAMOUS BEL-CANTO

Loud Speaker—Price \$30
Direct from Factory to you.
Delivered, free C.O.D. to your door.
Coming. "The Bel-Canto Headset,"
something entirely new.

BEL-CANTO MFG. CO.
General Office and Factory, Dept. R. W.
417-419-421 E. 34th St., N. Y. City
Vanderbilt 8959

USB

EVEREADY Radio Batteries

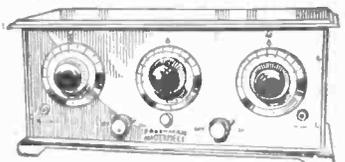
—they last longer

Buy!

The Greatest Value
ever offered in a
Radio
Receiving Set ~

FRESHMAN MASTERPIECE

5 Tube Tuned Radio Frequency



Ask your Dealer
for a demonstration
or write for complete
literature ~ ~ ~

\$60

Chas. Freshman Co. Inc.
Radio Condenser Products

106 Seventh Ave., New York

HOOK-UPS FOR EVERYBODY—Henley's 22
Radio Circuit Designs, \$1.00, postpaid. The Co-
lumbia Print, 1493 Broadway, N. Y. C.

Some Stations Run Booking Agencies

SOME radiocasting stations, their operating expenses about \$1,000 a week, hence leaving no possibility of paying artists who appear, are solving the problem of "who shall pay for radiocasting" in their own way. They have established booking agencies, often right on the premises. The artists get the benefit of the advertising afforded by their appearance. Anybody desiring talent has only to phone or write to the station, naming the artists desired. The

artist, when paid by the person or organization hiring him or her in this way, pays an agency commission to the station. Often theatrical producers have scouts listening in and visiting stations, too, seeking new and brilliant artists.

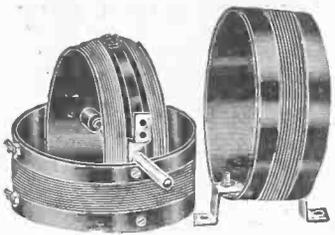
Another phase of the talent question is discussed by E. B. Mallory, of the radio apparatus section, Associated Manufacturers of Electrical Supplies, 30 East Forty-second Street, New York City. He says:

"Talented singers and musicians introduced by radio have subsequently attained professional engagements in the theatre or on the concert stage, and there is no dearth of entertainers who seek the opportunities of the air. Consequently a new activity has been developed in the modern radiocasting station. The professional musical director tests and grades the capabilities of singers and musicians who would radiocast to the radio audience. In such stations as maintain such office the musical director usually gives daily auditions for two or three hours every afternoon, except Sunday, and hears from 25 to 30 applicants a day. So high are the

standards maintained by some of the leading stations that some theatrical and concert

PETER J. CONSTANT, INC.
 91 Seventh Ave. New York City
 Direct Factory
DISTRIBUTORS FOR
38 Leading Manufacturers

EASTERN COUPLER and Inductance



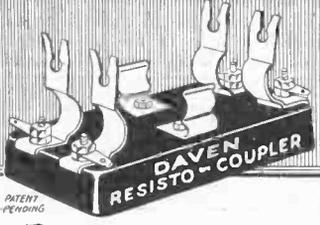
Price \$6.00 *An Unrivaled Value*
 100% EFFICIENT for the
SUPERDYNE CIRCUIT

This circuit, which uses only four tubes, is the ONLY RIVAL of the SUPER-HETERODYNE and surpasses all other circuits for all around efficiency. Radio engineers all endorse the EASTERN COUPLER for maximum results with the Superdyne Circuit.

Wound with double silk wire on genuine bakelite tubing, with moulded rotor.
 This circuit is less expensive to construct than most 3 tube sets.
 Picture hook-ups and material list FREE with each coupler.

Mail Orders Filled. Dealers Communicate.
EASTERN COIL CORP.
 22 Warren St. Dept. RW, New York, N. Y.

DAVEN RESISTO-COUPLER



Resistance Coupled Amplification

The tone quality from a **DAVEN RESISTANCE COUPLED AMPLIFIER** is the most perfect known to the radio art.

The Daven Resisto-Coupler, illustrated, greatly simplifies the construction in building up one of these distortionless amplifiers. Sold everywhere. \$1.50

Read our booklet, "RESISTORS—THEIR APPLICATION TO RADIO RECEPTION"

By Zeh Bouck.

Price 15 cents

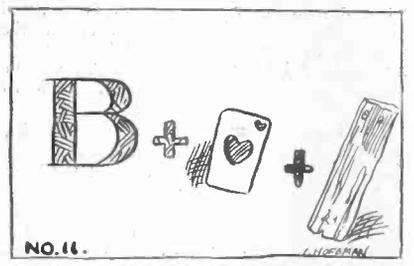
DAVEN RADIO CORP.
 "RESISTOR SPECIALISTS"
 9½ Campbell Street
 Newark, N. J.

The Weekly Rebus

REBUSES No. 9 and 10 are republished herewith. In last week's issue, August 16, Rebuses Nos. 6, 7 and 8 were reprinted, and the week before, August 9, Nos. 1, 2, 3, 4 and 5. The object in republishing these ten is to enable everybody to get on the Rebus Honor Roll. All those correctly answering Rebuses Nos. 1 to 12 inclusive will receive such honorable mention and their names will be published. Herewith is printed also a new Rebus, No. 11. Next week, issue of August 30, on sale August 27, Rebus No. 12 will be printed. That will complete the



Rebus No. 9 on top and No. 10 on bottom.



necessary dozen for Honor Roll candidates. Therefore, the only issues necessary to enable you to get on the Honor Roll will be August 9, 10, 12 and 30. Address Rebus Editor, RADIO WORLD, 1493 Broadway, New York City.

- REBUS NO. 7**
- Wm. G. Wheat, 2607 Benton Blvd., Kansas City, Mo.
 - B. J. Killeen, 34 Indiana St., Wheeling, W. Va.
 - Wm. B. Lahn, 861 Dumont Ave., Brooklyn, N. Y.
 - H. V. Petrie, Box 357, Hazelton, Kan.
 - Elmo Lehman Jr., 35 West 2nd St., Jacksonville, Fla.
 - H. G. Bergmann, 5217 Ellis Ave., Chicago, Ill.
 - Roy Love, 328 East 12th St., New Albany, Ind.
 - Jos Landry, Allerton, Mass.
 - J. E. Bouck, 742 Jefferson Ave., Grantwood, N. J.
 - Alfred E. Ritter, 250 Crocus Ave., Floral Park, L. I., N. Y.
 - C. Homewood, 7025 Glenoch St., Philadelphia, Pa.
 - Alfred E. Ritter, 250 Crocus Ave., Floral Park, N. Y.
 - Wm. D. Lahn, 861 Dumont Ave., Brooklyn, N. Y.
 - Alader Nagy, 772 9th Ave., New York City.

ARE YOU GOING TO BUILD A SET?

We have just what you want—complete outfits of the very best parts for the construction of the most popular and best circuits of today.

We use the very best standard parts which we can obtain—Acme audio transformers, Radion panels and dials, Frost and Federal jacks, Acme and Erla Radio frequency transformers, Pads rheostats, Carwell, National, American Brand low loss variable condensers, Dubilier Micaoms, etc.

By selling the complete outfit, we can offer the receivers at a price considerably lower than what it would cost if the parts were purchased separately. In addition, the panel is drilled, and the receiver is completely assembled, ready for wiring. Bus wire and lugs are included, and complete blue prints and instructions are furnished so that even the beginner who has never had any previous experience, can make in a short time, a perfect receiver, equal in every respect to the factory made product.

For those to whom price is the first consideration, we have prepared a Grade B set of a number of the receivers, using exactly the same parts as the Grade A set, except for the variable condensers, which are of signal manufacture, and the A. F. transformers, which are made by the Coto Coil Co. These are very good parts, but are not quite as expensive as those which we use in our Grade A sets.

The receivers which we list are the very best in every particular for the number of tubes which are employed, and will give maximum satisfaction.

1 tube. Reflex. Will operate a loud speaker on local stations. This set has done 2,000 miles with phones. No howling, whistling, nor radiation. Perfect tone. Very selective.	Grade A, \$18.50	Grade B, \$15.00
2 tubes. Reflex. Loud speaker range 500 to 1,000 miles.	Grade A, \$26.00	Grade B, \$22.00
2 tubes. Reflex. Our new receiver. See Radio World, July 5 to August 2, for details. Equals five tube receivers. Up to 2,500 mile range, very selective.	Grade A, \$33.50	Grade B, \$28.50
3 tubes. Reflex. 1,000 or more miles loud speaker range.	Grade A, \$33.50	Grade B, \$30.00
4 tubes. Reflex. Has done 3,000 miles with an indoor antenna or loop on the loud speaker.	Grade A, \$43.50	Grade B, \$38.50
4 tubes! Superdyne. Featured by Radio World. Better than the 6 tube Navy amplifier.	Grade A, \$38.00	Grade B, \$35.00
5 tubes. Neutrodyne. The most popular circuit at the present time.	Grade A, \$45.00	Grade B, \$38.50
8 tubes. Super-Heterodyne and Ultradyne. "The coming receivers for this winter."	Grade A, \$85.00	

If the receiver which you desire is not listed, write us.

Satisfaction Guaranteed

The Biltmore Radio Company
 Dept. W Boston 30, Mass.

AMPERITE

The "SELF-ADJUSTING" Rheostat

—Simplifies Wiring
 —Eliminates Hand Rheostats

Perfect For Every Circuit

Recommended in the "MAGNADYNE"

Manufacturers:
 Radial Co., 320 W. 42nd St.
 NEW YORK



\$1.10 EVERYWHERE

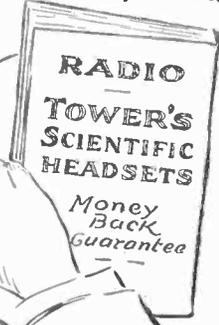
Write Dept. W-4 For Free Hookups.



TOWER'S Scientific
 WEIGHS ONLY 8OZ
 Perfect Tone Mates
\$2.95
 Plus a few cents postage



Buy a Headset you'll be proud of



OUR \$200,000.00 COMPANY STANDS SQUARELY BACK OF EVERY HEADSET

WORLD'S GREATEST HEADSET VALUE

now \$2.95, with Notable Improvements

Longer Cord (full 5 feet), Stronger Magnets, Higher Resistance, Increase of Sensitivity, Perfect Tone Mates
 EVERY SET TESTED BY LICENSED RADIO OPERATORS

Send no money - Order on a Post-Card

THE TOWER MFG. CO., Dept. D.98 BROOKLINE AVENUE, BOSTON, MASS.



Mounting Parts for Solodial Circuit

(Continued from page 6)

thereupon drilled for the rheostat in perpendicular alignment with the center of the condenser dial. The push-pull switch, which may be any anti-capacity battery switch, is mounted about 1 1/4 inches to the right of the rheostat. In Fig. 3 the double circle effect represents the switch. The single-circuit jack is mounted 1 inch to the right of the switch. Both are in hori-

zontal alignment with the center of the rheostat knob. Those who intend to add two stages of audio-frequency amplification will do well to mount the switch to the left of the rheostat and the jack to the right of the rheostat. This is because the coil should be perpendicular at left of the variable condenser (looking at the panel front) to avoid interaction between the fields in the transformers and in the terminal coil. Adding two stages of AF will be explained fully in next week's issue of RADIO WORLD.

the nut and, with 1/2" protruding from the end of the spaghetti, cut the wire. This 1/2" is bent in circular form. Now a 5" piece of string is passed through this circle or through a hole in the brass angle (a piece of paper being wrapped around the

WHAT IS AN INVENTION?
 How to obtain a patent and other valuable information is supplied in our FREE Booklet.
 Write for a copy today
MANUFACTURERS PATENT CO., Inc.
 70 WALL STREET, NEW YORK

DUTCH RADIO VALVE
D-201-A
 .25 Amp. 5-8 Volts
Detector-Amplifier
Guaranteed
 Rigidly tested by expert engineers.
List Price \$4.00
 Special discount to dealers - a few more distributors wanted.
 Sole Distributors for U. S.
 D. R. V. Importing Co.
 515 Orange St., Newark, N. J.

Dealers write to distributors in your territory.

Distributors
 CALIF.—MARSHANK SALES CO.
 1240 South Main St., Los Angeles, Cal.
 MISSOURI—ST. LOUIS RADIO TUBE LABORATORY
 3572 Olive Street, St. Louis, Mo.
 CANADA—CONSOLIDATED ELECTRIC LAMP CO.
 43 Queen St. E., Toronto, Ontario

The condenser and rheostat, with knobs, and the switch and jack being mounted, place the 6" x 5" baseboard against the back of the panel, 1/2" from the bottom, leaving 1/2" free panel on sides and bottom. Measure off the distance from the condenser for mounting the tube socket on the baseboard. The distances should be sufficient to enable the tube to be inserted without touching the back of the condenser and the fixed crystal to be mounted on the G post of the socket likewise. See Fig. 2. Now put the baseboard on a table and fasten the socket to it with two screws. Secure a spring clip to the P or plate post of the socket.

Next mount the tuning coil on the variable condenser. A brass angle with 1" or 1 1/2" arms will suffice. These are purchasable in some radio retail stores, in hardware stores and in some chain stores, costing 10 or 15 cents. If no brass angle is obtainable, bus bar may be used, as it is strong enough to support the light coil. Make a loop in the bus bar so it can be fastened horizontally to a screw on the back of the condenser with the accompanying nut. Condensers have extra contact points of this kind. Slip a piece of spaghetti 3" long on the bus bar. Bend the bus bar upward at right angles 1 1/2" from

10c Brings You Our New 48-Page Radio Catalog Includes Thousands of Unequalled Radio Bargains

Send a dime for your copy, today!



CHICAGO SALVAGE STOCK STORE
 Dept. W6, 500 South State Street
 CHICAGO

Wiring of Circuit is Easy

angle first). The coil is placed against the brass angle or bus bar and the piece of string is passed across the circumference on top to the inside of the coil and back to the beginning of the string, where the two ends are knotted after the string is drawn taut. Now put the baseboard against the rear of the panel again and find a convenient place to mount the .001 mfd. and .002 mfd. fixed condensers. The .002 mfd. fixed condenser should have a spring clip mounted on the side nearer the panel. If the two fixed condensers are to be secured flat against the baseboard, four holes may be drilled in the baseboard and two separate pieces of

cord passed through these and around the condenser for fastening. Two pieces of paper, for insulation, should be placed on the baseboard, under the condenser, and cut to exact size. The paper is used in layers.

Wiring Directions

1 Wire the A battery leads. The A+ goes (a) direct to the F+ post on the socket, (b) to one side of the fixed condenser, C2 (.001 mfd.) and (c) to the B battery—. The A— of the battery goes to one side of the rheostat, the other side of the rheostat being connected to the A— post of the socket. Try out the tube. See if it lights gradually as you turn on the rheostat.

2 Connect the beginning of L (primary of the tuning coil) to the ground and to one side of the switch S. The beginning is nearer the center of the coil. The end of L remains forever unconnected to anything.

3 Attach the fixed crystal to the G post of the socket. Connect the beginning of L2 (a) to the rotor or movable plates of the low-loss .0005 mfd. variable condenser C1 (if a high-loss condenser were being used this connection would be to the stator or fixed plates); (b) to the remaining unconnected end of the fixed crystal. Connect the end of L2 (a) to the other side of the variable condenser and (b) to one side of the fixed condenser C3 (.002 mfd.).

4 Connect the remaining side of C3 (a) to the plate or P post of the socket, (b) to the aerial and (c) to one of the leaves of the jack, J. Connect the remaining free end of C2 to the unconnected side of the switch S. Again see whether the tube lights. If it does, then connect B+ to the unconnected leaf of the jack.

Tubes

Any tube, except Sodian, will work in this circuit, and even Sodian will function if regeneration is not to be used. But the UV199 type of tube, using a 4½-volt C battery as the A battery, was the one I used. C299 is in the same class and may be used. This type is an excellent detector.

Tuning

All the tuning is done with the variable condenser, except when regeneration is used by turning on the switch, when the rheostat aids control of regeneration.

Tuning for stations within 100 miles may be done without the use of regeneration. Turn the rheostat on until the tube lights (Concluded on next page)

Burnt-Out Tubes Replaced for \$2.50



A Wonderful Tube for Your Superdymne.

GUARANTEE

Burnt-out, Defective or Broken Tubes of any brand or make whatsoever will be replaced by a brand new (not re-filled) Royaltron Tube, at a cost of only \$2.50.

Every ROYALTRON Tube is accompanied by the above money-back guarantee.

It is with the Object of Advertising the MERITS of ROYALTRON Tubes, that we make the above unusual offer.

Approved by the Radio News and World Laboratories

ROYAL MANUFACTURING CO.
Department W. O.
206 BROADWAY NEW YORK
Dealers, distributors and agents, write or wire immediately for unusual proposition.



LEGO WONDER FIXED DETECTOR

For REFLEX & CRYSTAL SETS

Something Entirely New!
100% SENSITIVE

10 IMPORTANT FEATURES READ THEM CAREFULLY

- 1—No parts to replace or wear out.
- 2—The use of a NEW MATERIAL that effectively eliminates distorted and interrupted reception, and substitutes clarity and increased volume.
- 3—Absolutely 100% sensitive. No searching for sensitive spot.
- 4—Glass encased, it is immune from sun and dust.
- 5—Especially designed to withstand high voltage in reflex circuits.
- 6—Solidly constructed throughout, it is practically everlasting.
- 7—It is ALWAYS READY—no adjustments of ANY kind needed.
- 8—As good looking as it is efficient. High nickel-plated throughout, and attractively designed. It enhances the appearance of any set.
- 9—Constructed so that it is thoroughly VIBRATION-PROOF.
- 10—Carefully tested, approved and unconditionally guaranteed by its makers.

For Sale by All Dealers 99c. or Sent Postpaid Insured \$1.00

LEGO CORP., 225 W. 77th St., N. Y. C.



Are you getting DX?

This book will show you how to get more!

It tells all about vacuum tubes and how to control them so as to get greatest D X, most volume and longest life from tubes and batteries. How to get maximum regeneration, clearest signals. Tells how vacuum tubes work.

IT'S FREE! WRITE FOR IT TO D X INSTRUMENT CO.

Dept. RW-823 Harrisburg, Penna.

MAHOGANITE and BLACK RADION PANELS

DIALS, KNOBS, TUBING, SOCKETS MAHOGANITE BINDING POSTS

"THAT SPECIAL SIZE" FOR YOUR PHONOGRAPH, PORTABLE OR SUPER

ALL STOCK SIZES
WHOLESALE RETAIL
Send for Complete Price List

New York Hard Rubber Turning Co.
212 Centre Street New York City

WE REPAIR RADIO TUBES



WD-11 .. \$2.50	DV-2 .. \$2.80
WD-12 .. 2.50	DV-6A .. 2.50
UV-200 .. 2.50	UV-199 .. 2.50
UV-201 .. 2.50	C-299 .. 2.50
C-300 .. 2.50	UV-201A .. 2.50
C-301 .. 2.50	C-301A .. 2.50
DV-8 .. 2.50	Marcni .. 2.50
DV-1 .. 2.50	Moshead .. 2.50
6 v. Plain Detector .. 2.50	
6 v. Plain Amplifier .. 2.50	

Mail orders so handled and promptly attended to.
Dealers and agents write for special discounts.

H. & H. RADIO CO.
P. O. Box Z-B
Clinton-Hill Station Newark, N. J.

The "Goode" Two-o-One

A

Le Ton d'argent



Guaranteed

BY MAIL ONLY

\$2.39

Postpaid

QUARTER AMPERE AMPLIFIER-DETECTOR RADIO TUBE

GUARANTEED SATISFACTORY

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

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

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

(All Postage Prepaid)

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

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

The Goode Tube Corporation
Incorporated
EVANSVILLE INDIANA

Parts for 1-Dial Set

(Concluded from preceding page)

well, then rotate the condenser dial. If the signal heard is faint, turn the rheostat higher. If it is loud, turn the rheostat lower until the signal strength begins to wane, then increase the current supply to the minimum point where maximum volume is restored. To use regeneration for hearing that station, turn the rheostat much lower, say five or six revolutions of the knob, turn the dial back three degrees and turn on the switch. The fixed condenser .001 increases the natural wavelength when cut in, hence reduces the capacity required of the variable condenser. Just what this

differential is on your set you will soon learn. On mine it is three degrees.

If a soft signal is now heard, turn the rheostat higher. When good volume is heard, stop. Otherwise you will pass the saturation point and cause squeals. If these directions are followed there should never be any squeals, whether or not regeneration is used.

PARTS NEEDED

- One 23-plate low-loss condenser.
- One 4-inch dial.
- One spool (50 feet) No. 22 SCC wire.
- One UV199 tube or equal.
- One socket.
- Two clips to fit socket posts.
- One 7 x 7 inch panel.
- One 7 x 7 inch cabinet.
- One 6 x 6 1/2 inch baseboard.
- One carbon pile rheostat with switch.
- One anti-capacity battery switch.
- One C Battery, 4 1/2 volts, to be used as the A Battery (4 x 1 1/2 inches).
- One midget B battery, 22 1/2 volts (2 1/4 x 3 1/2 inches).
- One .001 fixed condenser.
- One .002 fixed condenser.
- One fixed crystal.
- One pair of earphones.
- One single-circuit jack.
- One plug.
- Lugs, solder, connecting wire, 100 ft. aerial wire, 50 foot lead-in wire.

[In RADIO WORLD next week, issue of August 30, an article will be published fully explaining the best way to add the most compact form of AF to this or any other circuit. The panel space for the two stages is 7" x 5". The actual sizes are shown in accompanying diagrams.]

Notification of Davis and Coolidge a Success; Remote Control Is Used

FIFTEEN stations radiocast the speech of John W. Davis on the occasion of notification of his nomination for President by the Democratic Party. The exercises were held at Clarksburg, West Virginia, his home town. The radiocasting was very successful. Many stations not among the fifteen courteously shut down.

Three days later the notification of President Coolidge of his nomination as the Republican candidate was made. It, too, was radiocast with equal success.

TUBES REPAIRED \$2.50

GUARANTEED

ALL STANDARD TYPES 24 hour service
 WD-11—WD-12 Mail Order
 UV-199—UV-200—UV-201A Sent Parcel
 Post C.O.D.
RADIO TUBE SERVICE CO.
 239 Centre Street, near Grand New York City

The Ultimate Radio Receiver

THE FLEX-O-DYNE CO.

1674 Broadway (At 52nd St.)
 New York, N. Y.
 Circle 4561

SUMMER NUMBERS OF RADIO WORLD

Complete your file if you have missed any summer numbers of Radio World while on your vacation! Do not fail to get the following numbers:

- May 31—A Sensitive 3-Tube Reflex. By Hyrt C. Caldwell.
 - June 7—How to Solve Your Tube Problems. By P. E. Eitelman.
An Ultra-Sensitive 3-Tube Reflex. By Hyrt C. Caldwell.
 - June 14—A Sensitive Double Superdyne. By Fennimore Keene.
How to Build a Set Like King George's. By Chas. H. M. White.
A Super-Power 4-Tube Reflex. By Hyrt C. Caldwell.
 - June 28—Nineteen Ways to Erect an Antenna. By P. E. Eitelman.
Distance-Getting 3-Tube Set. By Chas. H. M. White.
 - July 5—Making the Superdyne Work Right. By Brewster Lee.
DX on 1-Tube and a Crystal. By J. E. Anderson.
 - July 12—1-Tube Set Works on a Loud Speaker. By A. P. Peck.
A 1-Tube Set That You Can Log. By Herman Bernard.
Discussion of Inductance and Capacity. By N. N. Bernstein.
 - July 19—Tips on the Superdyne. By N. N. Bernstein.
Loops. By E. J. Swartz.
 - July 26—A New 4-Tube Reflex Super-Heterodyne. By Chas. H. M. White.
1,500 Miles on 2-Tubes. By Herman Bernard.
 - Aug. 2—Portable Super-Heterodyne. By A. P. Peck.
The Ford of Radio. By A. F. Lepierre.
 - Aug. 9—Dynodex, a 1-tube Loud Speaker Set. By N. N. Bernstein.
Experimenting With Single Knob Control Sets. By Herman Bernard.
- 15c. per copy, or any seven copies for \$1.00, or start your subscription with any of these issues.
- RADIO WORLD**
 1493 BROADWAY NEW YORK CITY

ARE YOU JUST BACK FROM YOUR VACATION?

If so, no doubt you have missed some of the great features that appeared in RADIO WORLD during the summer months. Any issue can be sent you for 15c, or the thirteen issues from June 1 to August 30 for \$1.50—or any corresponding period for the same price. RADIO WORLD, 1493 Broadway, N. Y. C.

For Maximum Amplification Without Distortion and Tube Noises

use the well known

Como Duplex Transformers

Push-Pull

Send for literature.

COMO APPARATUS COMPANY

448 Tremont St. Boston, Mass.



ULTRADYNE

the Improved Super-Heterodyne.
 Send 50c for book giving complete details of drilling, assembling, wiring and tuning 6 and 8 tube ULTRADYNE Receivers.

PHENIX RADIO CORP., 5-9 Beekman St., N. Y. C.

RADIO RECORD

Keep a permanently bound record of all stations you have received and how you received them. Radio Record 3 1/2" x 14" — 600 lines. All broadcasting stations listed and indexed with space for new stations—\$1.00 Postpaid.

THE BEADLE PRINTING CO.
 MITCHELL SOUTH DAKOTA
 Applause Cards 60 for \$1.00 Postpaid.

LATEST DEVELOPMENTS IN THE SUPERDYNE CIRCUIT IN TEXT AND DIAGRAMS

RADIO WORLD dated May 17, 24 and 31 contains a series of three articles covering all the angles of the famous Superdyne Circuit. The original Superdyne Circuit articles appeared in Radio World last December, and the three issues in which they appeared are now completely out of print. That is the reason why we have published the Superdyne series in the May 17, 24 and 31 issues. 15c. per copy, three for 45c., or start your subscription with any number. Also "Trouble-shooting for the Superdyne," showing what to do and where to find mistakes after you have built your set. Get July 5 issue. 15c. per copy.

SPECIAL SUBSCRIPTION: Send \$6.00 for one year's subscription and we will send you our issues of May 17, 24 and 31 as a premium.

RADIO WORLD, 1493 Broadway, N. Y. City

RADIO WORLD'S QUICK-ACTION CLASSIFIED ADS.

5 CENTS A WORD. 10 WORDS MINIMUM. TELEPHONE YOUR CLASSIFIED IF IN A HURRY.
 RADIO WORLD'S PHONE NOS. ARE LACKAWANNA 2062-6976.

PATENTS—SEND DRAWING OR MODEL FOR EXAMINATION AND OPINION. Booklet free. WATSON E. COLEMAN, Patent Lawyer, 644 G Street, Washington, D. C.

SUPERHETERODYNE FILTER. Eliminates noises and distortion. An essential finishing touch. Consists of choke coil, non-inductive resistors and diagram, \$6.25. RADIO CENTRAL, Abilene, Kan.

NO TUBES OR BATTERIES—DX and Loud Speaker records. A new crystal set. Send \$5 for special coil and Crystal Hookup. Complete set \$10. Ra. D. O. Co., Pomona, Calif.

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

M. B. SLEEPER'S DESIGN DATA FOR RADIO TRANSMITTERS AND RECEIVERS— Sent postpaid on receipt of 75c. The Columbia Print, 1493 Broadway, N. Y. C.

THE WORLD'S LARGEST DOG KENNELS offer for sale Orang Airedale watch dogs, automobile dogs, children's companions, farm dogs, stock drivers, hunters and retrievers. Also Big Game Hounds, Coon Hounds, Fox Hounds, Rabbit Hounds and thoroughbred Hounds, and Airedale puppies. Satisfaction and safe delivery guaranteed to any point in the United States. Large illustrated, descriptive catalog mailed free. OORANG KENNELS, Box 139, La Rue, Ohio.

NEW CRYSTAL: Loud and clear; Kansas City fan says he heard Hastings, Nebraska, with this wonderful crystal. Amazes users. Regular price 30c. Special introductory offer 20c postpaid. Twin City Radio Co., 5902 Harrison, Kansas City, Mo.

SPECIAL SUPERDYNE CONDENSERS, transparent, enclosed, \$3.50 each. Complete (Original Specification) Coil set, \$4.00. Pauer, 152 Dewitt St., Buffalo, N. Y.

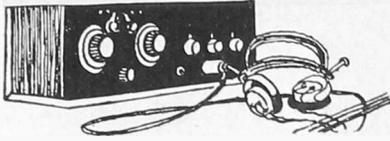
A ONE-TUBE SET YOU CAN LOG, cost of construction \$25. Two honeycomb coils and two condensers used. Full data in RADIO WORLD, issue of July 12. Send 15c for a copy.

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

WIRELESS IN THE HOME. By DeForest. Sent postpaid on receipt of 15c. The Columbia Print, 1493 Broadway, N. Y. C.

ALL ABOUT VACUUM TUBES, A. B. C. of Vacuum Tubes. Price \$1.00. 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, 5 cents per word, 10 words minimum. RADIO WORLD, 1493 Broadway, New York City.



The RADIO PRIMER

Information and Instruction for the Beginner

BALANCING INDUCTANCE AND CAPACITY

VARIABLE condensers of the same number of plates do not necessarily have the same maximum and minimum ca-

capacity. In fact, unless they are of the same make they seldom do. This is because the capacity depends not only on the number of plates but on their size and distance from one another, as well as the character and amount of insulation. Low-loss condensers are preferable because they minimize the amount of wastage of the feeble radio-frequency current. Poor insulation, especially in quantity, affords a path of leakage.

The coil, however, is constant in its characteristics. So many turns of a particular kind of wire on a tube of a certain size has a fixed natural wavelength. Particularly honeycomb coils have such fixed ratings. Variocouplers and variometers are like variable condensers, however, rotation changing their wavelength.

For a combination of coil and condenser to cover the radiocast wavelength band they must be matched or balanced with that end in view. Generally a 75-turn honeycomb coil with a good variable condenser (that has a wider range than a poor one) will cover the band. Anybody can easily balance his coil and condenser, unless the condenser has too small a maximum capacity or is of the high-loss type that has a short range.

If a home-made coil is used, 55 turns of No. 22 SCC or DSC wire, on a 3" diameter tube, in conjunction with a 23-plate variable condenser, will do the trick usually.

If you find your combination does not reach the higher wavelengths, add more turns of wire. Inductance is to be favored as against capacity in the detector circuit, because inductance automatically includes some capacity, due to the self-capacity of the coil. This is usually called distributed capacity and is caused by the condenser effect between successive or superimposed turns of wire. The insulation on the wire and the tiny air gap between turns constitute the dielectric. Thus it is better to avoid capacity where possible and add inductance.

Having wound or bought a coil that reaches the highest radiocast wavelength, now see whether the lowest wavelength comes in. If it does not, the condenser

may be at fault. At any rate, by tapping the coil two-thirds from the beginning, and using a home-made 2-point switch, parts for which are inexpensive, you will bring in "the low ones" delightfully. In this case the switch must be turned so that the lesser amount of inductance or turns of wire is used. For the higher waves use the full inductance. Of course the dial settings will be different when one tap is used instead of the other.

If honeycomb coils are used, a 50-turn coil in series with a 25-turn coil, tapped where they join, will do nicely, the 50 turns being first.

CRYSTAL SETS TESTED 600 MILES
You can now get a genuine Lambert Long Distance Crystal Radio Set for only \$4.98. Particulars Free! Leon Lambert, 562 Volusia, Wichita, Kan.

RADIO CRYSTALS
MOUNTED, UNMOUNTED, BULK
Packed under your own label if desired.
Dealers and Jobbers—Write us for lowest prices on Quality Crystals.
MELODIAN CO. OF AMERICA
INDEPENDENCE, MISSOURI

POWER

From Your Lamp Socket
Send for particulars.
SIDBENEL RADIO CO.
29 Mount Eden Ave., New York, N. Y.

THERE IS A BRAND-NEW CRAM'S RADIO MAP

(New Edition)
Just issued with all the very latest broadcasting stations and information.

ALL THE STATIONS OF THE UNITED STATES AND CANADA

Scale 100 miles to the inch in two colors—Size 34x28"

PRINTED ON HIGH-GRADE MAP PAPER
1" P TO-THE MINUTE INFORMATION
INDICATING ALL AMATEUR AND STAN-
DARD BROADCASTING STATIONS
WITH COMPLETE INDEX OF STATIONS
35c (POSTPAID)

THE COLUMBIA PRINT
1493 BROADWAY NEW YORK CITY

\$15 Set Gets 2,000 Miles
The Essex Radio Special, the receiving set with a condenser, gets you more distant stations clearer and sweeter than sets costing ten times its price. \$15 Set complete with cabinet, without tube or batteries. \$20 Set complete with cabinet, tube and batteries.
ESSEX RADIO SERVICE
617 West 125th St. New York
Detailed information on request.

COSMOPOLITAN PHUSIFORMER
Send Fifty Cents for Manual
15-17 West 18th St., New York

PUSH-PULL TRANSFORMERS
\$13.00 List, Thordarson \$11.75
5.00 Acme Audio or R. F. Transformers 3.95
Super "B" Battery, Rechargeable, 24 Volt 4.65
Remittance Must Include Postage.
SEND FOR NEW FREE PRICE LIST
Marvel Radio Specialty Co. 132 NASSAU ST.
NEW YORK CITY

Free Mailing Lists
Will help you increase sales
Send for FREE catalog giving counts and prices on thousands of classified names of your best prospective customers—National, State and Local—Individuals, Professionals, Business Concerns.
99% Guaranteed by refund of 5¢ each
ROSS-Gould Co. 315 N. 10th St. St. Louis

THAT 1-TUBE SET
The one-tube reflex brought out in Radio World dated July 12 is unusual because of the fact that no crystal detector is used, the radio frequency detector and audio frequency action being done entirely with one tube. Full description and diagrams in Radio World dated July 12. Mailed on receipt of 15c. postpaid or start your subscription with that number.
RADIO WORLD, 1493 Broadway, N. Y. C.

Subscribe NOW and Receive Another Radio Publication Without Extra Cost

Radio World has made arrangements

- to offer a year's subscription for
- any one of the following publications
- with one year's subscription for
- RADIO WORLD;
- RADIO NEWS or
- POPULAR RADIO or
- RADIO BROADCAST or
- WIRELESS AGE or
- RADIO DEALER or
- RADIO (San Francisco).

This is the way to get two publications

- for the price of one!
- Send \$6.00 today for RADIO WORLD
- for one year (regular price)
- for 52 numbers)
- and select any one of the other
- six publications for twelve months—
- Add \$1.00 a year extra for
- Canadian or Foreign postage.
- Present RADIO WORLD subscribers
- can take advantage of this offer by
- extending subscriptions one year NOW.
- Or order thru your newsdealer.

RADIO WORLD'S SPECIAL TWO-FOR-PRICE-OF-ONE SUBSCRIPTION BLANK

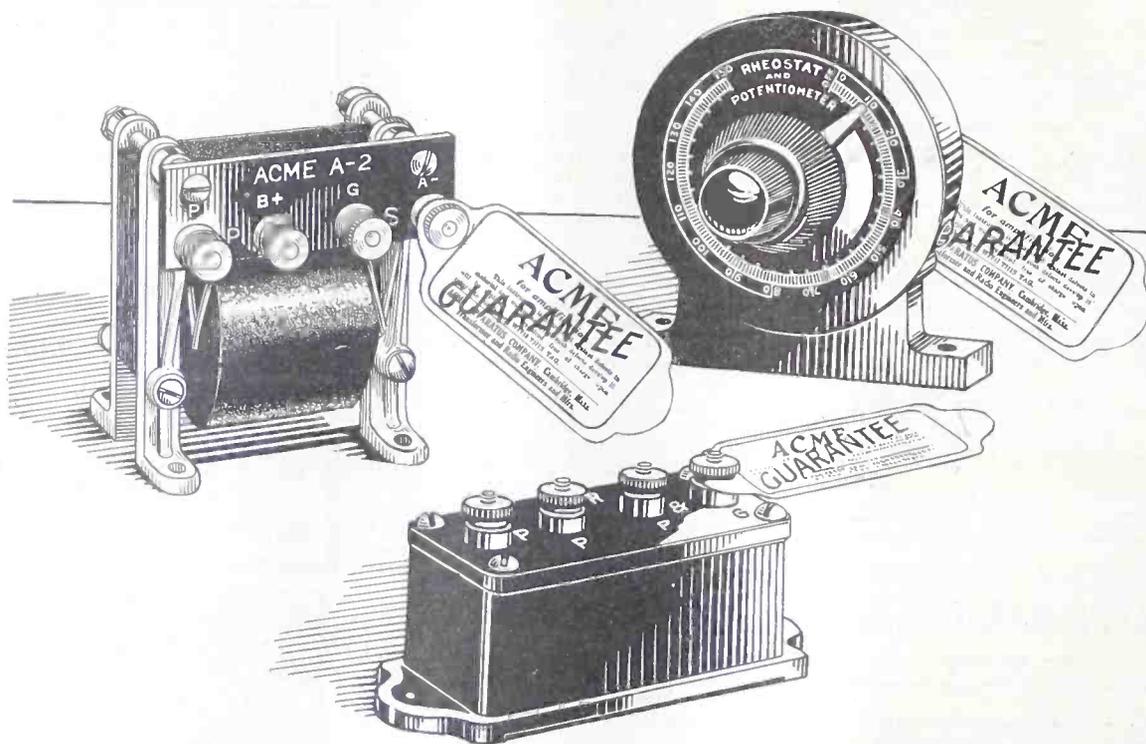
RADIO WORLD, 1493 Broadway, New York City.

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 for twelve months, beginning Put a circle around the other publication you want.

Indicate if renewal
This Offer Good
Until
Sept. 10, 1924

Name
Street Address
City and State

What "ACME" means by a guarantee



HERE are no ACME seconds. All ACME transformers are rigidly inspected. Take the coils on audio frequency transformers, for instance, thousands of turns of small wire—one short circuited turn, and *out they go*.

TAKE the radio frequency transformers, each one of them tested in a radio frequency amplifier and if they don't give a standard amount of amplification at three different wave lengths (250-360-550 meters) *out they go*.

YOU may say, "Why the rigid inspection? The user can't make these tests"

—and we'll say "Insurance." Insurance on the product and insurance on the future. ACME has grown by making a superior product and making good should a defect in material or workmanship develop. Frankly, we cannot afford to put out a single inferior article.

Acme Service Stations

IF you think you are not getting the results with Acme Apparatus, write to the Acme Engineering Service, Cambridge, Mass., or get in touch with the New York Service Station.

ACME APPARATUS COMPANY

Transformer and Radio Engineers and Manufacturers

Dept. 128, Cambridge, Mass.

ACME

for amplification