FEB. 6 15 CENTS

RADIO WORLD

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Vol. 8. No. 20 ILLUSTRATED Every Week

THE FENWAY

A Versatile Set—Four Tubes or Nine

By Leo Fenway

LIST OF STATIONS

By Wavelength and Frequency

THE FENWAY in the home makes an imposing appearance. (See illustrated article starting on page 3).

The Newest Achievements of POWEL CROSLEY JR.

Industrialist—Pioneer Radio Builder—Master of Mass Production

Four Entirely New 4 and 5-tube Radio Sets—Also the Crescendon

Never before has Crosley engineering and manufacturing genius been so brilliantly demonstrated as in this group of new Crosley sets.

Here, at prices so low as to be literally revolutionary, are three 5-tube sets and one 4-tube set—entirely new in principle, design, circuit, and appearance—entirely unique in the results they give on distant and local stations—entirely unprecedented in the values they now introduce.

On two of these sets is offered the Crescendon, a new and exclusive Crosley feature—an extra volume control by which average incoming signals can be built up or modified in a manner nothing short of amazing. Introduced on the new 4-29 and 5-38, the Crescendon principle makes its first appearance in the low price field, its use having hitherto been restricted to one set costing several times as much.

Particular emphasis is directed to the new Crosley RFL receiving sets that utilize an entirely new and patented circuit which provides true cascade amplification and closely approaches the theoretical maximum of efficiency per tube. Non-oscillating at any frequency and absolutely non-radiating, the RFL Crosleys are specifically recommended for use in congested areas and for satisfactory performance in the hands of inexperienced operators.

In addition to their truly marvelous selectivity, sensitivity, and purity of tone, these new Crosleys have been given a new order of beauty that cannot help but win the highest admiration.

We do more than urge you to go to the nearest Crosley dealer for a demonstration! We ask you to go prepared for the most startling revelation in radio ever announced in the entire history of the industry—and predict that your expectations will be more than satisfied!

Crosley manufactures radio receiving sets which are licensed under Armstrong U. S. Patent No. 1,113,149, or under patent applications of Radio Frequency Laboratories, Inc.

THE CROSLEY RADIO CORPORATION, CINCINNATI, OHIO

Owning and Operating WLW first remote control super-power broadcasting station in America.

The Crosley 4-tube—4-29

in which the Crescendon is equivalent to one or more additional tubes of tuned radio frequency amplifiation $29

The Crosley 5-tube—5-38

All the volume, selectivity, sensitivity and purity of tone available in the best 5-tube set—*plus the Crescendon*.. $38

The Crosley 5-tube—RFL-60

A set so marvelous in performance that its appearance on the market is bound to create a new standard of comparison $60

The Crosley 5-tube—RFL-75

For simplicity and speed in tuning, fidelity of tone, and decorative beauty — it stands unchallenged at twice the price..... $75

West of the Rocky Mountains all prices as published are 10% higher

CROSLEY RADIO

BETTER · COSTS LESS

RADIO WORLD

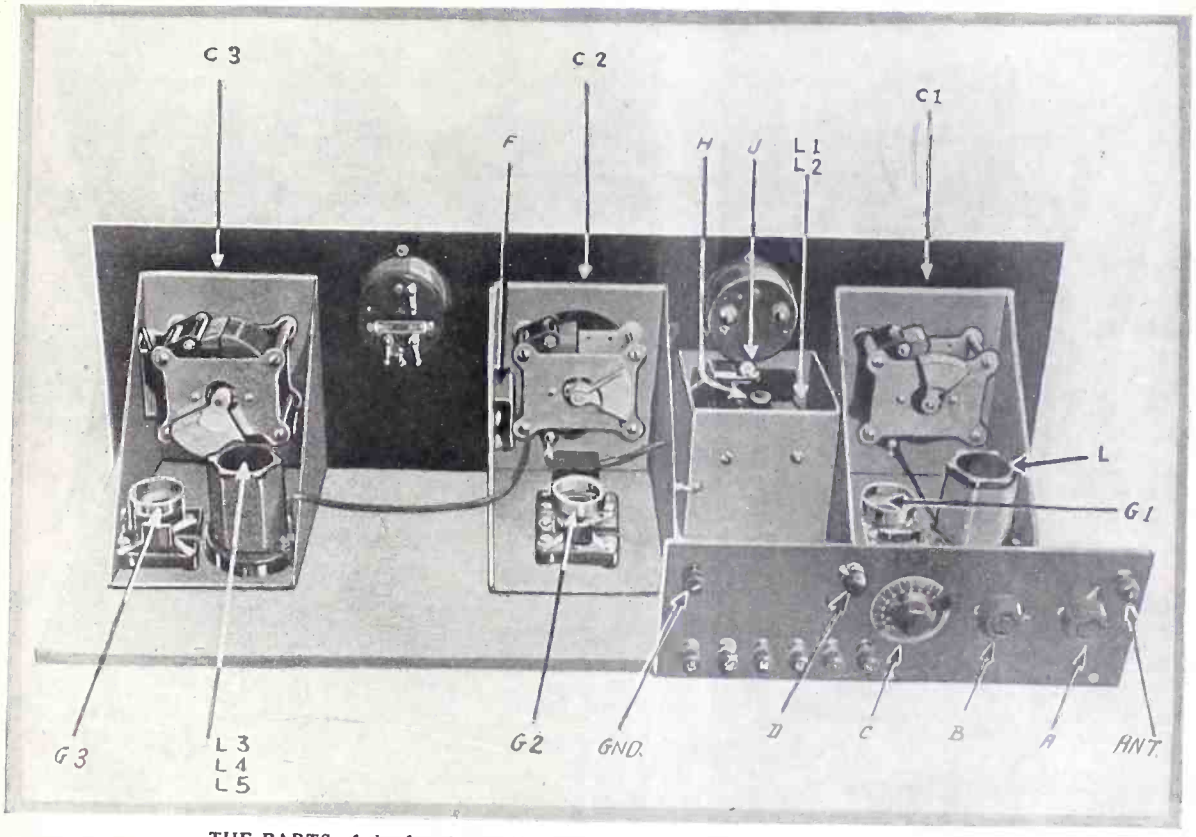
[Entered as second-class matter, March, 1922, at the post office at New York, N. Y., under the Act of March 3, 1879.]

A Weekly Paper Published by Hennessy Radio Publications Corporation from Publication Office, 145 West 45th St., New York, N. Y. Just East of Broadway Phones: BRYant 0558 and 0559.

Vol. VIII. No. 20. Whole No. 202 February 6, 1926 15c per copy, $6.00 a year

The Fenway

Uses Either 4 or 9 Tubes



THE PARTS of the foundation unit, after assembly. The meters also are mounted.

By Leo Fenway

PART I.

NEW YORK is the city with a radio complex, which means that the city of accelerated pandemonium rebels against ethereal encroachment. Not that the city itself is to blame, nor the many broadcasting stations—although they help some!—but the fault lies in the steel buildings, the subways, cellars and subcellars. The steel giants of the air especially are very hostile when it comes to inviting a neighboring city's radio wave to pay homage to the center of celerity.

As often as not a radio receiver that is heralded in the middle West as being "the last word in radio" runs into one of these steel monsters in New York, and immediately fades out of the foreground.

Three-, four-, five-, six- and seven-tube sets, that in other parts of the country bring in coast to coast reception nightly, have a tough time separating locals in this big man's town, not to mention cutting through the locals. In fact, I know of only one receiver that has successfully conquered the dead spots of New York. This set is the Fenway Super-Heterodyne.

Comparative tests in all parts of Manhattan, Brooklyn, Queens and some sections of Jersey show that this receiver has all the essentials for the most gratifying reception of broadcast programs.

Range 50 to 600 Meters

It can be made to cover wavelengths of from 50 to 600 meters; it is supersensitive—the whole continent actually comes in on the loudspeaker. It exhibits the greatest selectivity ever obtained on an aerial set—even more selective on a loop—which means that local stations do not interfere at any time; it is positive and accurate in tuning, and stations always are found at the same dial settings. It is stable, in that it holds a station indefinitely after the dials once are set; howls, squeals, whistles — except heterodyne whistles of two stations on the same wave—can be entirely suppressed. It will not radiate in any manner if operated properly although working with an antenna. Its volume is ample for speaker reception on stations up to 3,000 miles; its quality leaves little to be desired. Despite its nine tubes, the set is very economical, uses only 50 per cent of the B battery current that is reuired in most multi-tube sets. Furthermore, the intermediate frequency stages can be operated on less than twenty volts of B battery.

"Is it simple to operate?" you ask. Well, if you believe that one dial will tune more accurately than three, it isn't

Fenway Outperforms Competitors in Exhaustive Tests

[The Fenway is one of the most efficient receivers, having outperformed many competitors that were also of the home-constructed variety. It is remarkable on distance and its tone quality is superb. The circuit was developed by Leo Fenway, accomplished engineer and noted author.]

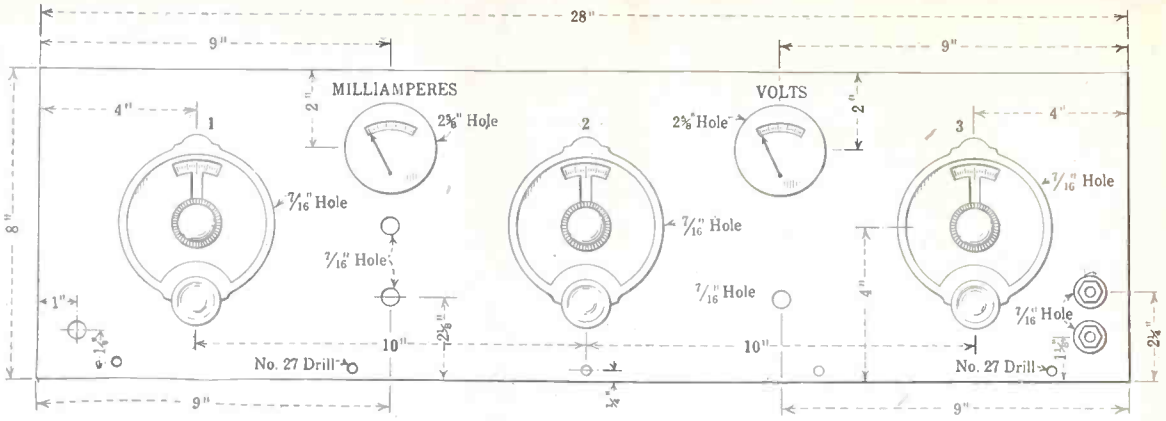


FIG. 2.

simple to operate. However, if you know anything about radio you must appreciate that independent dial settings are more efficient than unicontrol. It is common knowledge that circuits can be made electrically alike, but such circuits will not stay that way very long. Efficiency, being the paramount factor in this set, necessitated three dials.

In fact, in designing this receiver to a new standard of efficiency the writer had at his disposal the finest parts the market affords—regardless of cost. He was not handicapped by having to build to a price. Any one may build, from the step by step directions in these articles, a receiving set that a professional radio man might be proud of.

Care is Most Advisable

Now is a good time for the man who contemplates building a Fenway super to think of how well instead of how fast he can build his set. The two infernal radioisms "That's good enough" and "That will do" ought to be forgotten. Not that we mean to preach the doctrine of thoroughness, but the fellow who "takes his time" and "does a good job" will be rewarded with a wonderfully efficient ret-ceiver.

Fig. 1 shows the wiring diagram for the first step assembly. Perhaps when you built your last set you were told to mount everything on the panel, connect things up and see how it worked. That's one way to build a radio. Building it tube for tube, making each tube work before going on to the next, is another way. We call this last way "the common sense way," so will suggest that you build it accordingly. Now take a good look at the diagram in Fig. 1. Notice that the first tube, the first circuit of all, is a stage of tuned radio-frequency with regeneration. Pay particular attention to that special coupler, through which regeneration is accomplished. That coupler is going to play a very important part in this circuit, so do not lose sight of it for a moment. We are now ready for the foundation unit, which is the basic unit and the framework of your set.

A Tip on Success

The list of parts for the foundation unit includes the exact instruments used in the set from which these specifications were made, and were found to coordinate most efficiently. It is of paramount importance that these parts be used religiously, otherwise the builder of the set will have no "comeback" on the writer in the event that his set fails to perform according to expectations. What do I mean by a "comeback?" I mean that the man who builds a Fenway, using the exact parts I have specified, and who meets with grief of any nature can call upon me for assistance, and I'll wager that my patience will outlast his.

The panel and subpanel may be purchased already drilled and engraved to facilitate the assembly for the inexperienced builder and to insure the exact placing of the specified units. It is important that this layout be followed, because a change in position may lower the operating efficiency of the receiver.

However, by following the panel layout in Fig. 2 the kitchen table mechanic can prepare his own panel with excellent results.

The writer does not recommend "graining" the panel, but he does approve of a high gloss Bakelite panel. After the panel is all bored, having made sure that the center shafts turn smoothly, it can be

LIST OF PARTS FOR FOUNDATION UNIT

One antenna coil, interchangeable for waves from 35 meters to 550 meters, Silver Marshall, type 110-A. (L.)

One special coupler, General Radio, type 268. (This coupler to be rewound as shown in Fig. 4.)

One special oscillator coupler, Silver Marshall, type 111-A (L3L4L5).

Two Silver Marsball "Sockets," type 515, for above two couplers.

Three General Radio straight-line wavelength variable condensers, type 334-F, or type 247-F, .00035 capacity (C1, C2, C3).

One Bakelite panel, 8x22x3/16", drilled as per Fig. 2.

One General Radio rheostat, type 301, 6 ohms.

Three Airgap vacuum tube sockets.

One Yaxley A battery switch.

One Yaxley pilot light.

One Yaxley double circuit jack.

Three National Velvet Vernier Dials, type B, (new).

One Micamold grid condenser, .00025 capacity.

One Micamold .5 mfd. fixed condenser.

One Micamold resistor (grid leak), 2 megohm.

One Micamold grid leak mounting.

One Subpanel, Bakelite, 4x12".

One Gem safety fuse and fuse holder.

One General Radio tap switch, No. 171F.

Three General Radio taps, No. 138D.

One piece of Bakelite, 2½x2½x3/16".

Seven Eby binding posts, antenna, ground, minus A, plus A, minus B, plus B detector and plus B amplifier.

One set of four special copper cans.

One hardwood baseboard, 9½x27½x¾".

¼ lb. No. 32 copper wire, double silk or double cotton covered.

Fifty feet of Celalsite wire or Western Electric printing telegraph wire. Colors used: Red, green, black, brown and yellow. This item should be purchased in the following lengths: Red, 15 feet; black, 15 feet; yellow, 10 feet; green, 5 feet; brown, 5 feet.

Three Cunningham standard tubes, CX301A.

mounted to the baseboard with nickel headed wood screws. The cans, two of them, should now be put into place. The one will need to be attached to the panel with short machine screws

Condenser Mounting

After the cans are fixed to the panel mount the two condensers, C1 and C3. These two instruments can make contact with the copper; that is, the rotor plates, as this part of the circuit is grounded. But the second condenser, C2, must not touch the copper, as the rotor plates are not grounded until after the current passes through the pick-up coil, L3. Watch out for this. Next mount the three sockets in the cans. The first two sockets are mounted with the filaments toward the panel, the third socket, vice versa. All three are mounted in the right hand corner at the back of the cans.

Now mount a Silver Marshall "socket," type 515, in the first can and one in the third can. These sockets should be placed so that the binding post No. 3 of the "socket" is rather close to the grid binding post of the tube socket. Special care must be taken so that these coil sockets do not make contact with the copper, except in such places as are shown in the electrical circuit. Use flat head wood screws to hold the coil socket in place. These, of course, must be countersunk.

You should now prepare the special coupler, following the instructions given in Fig. 4. Be sure, in winding this coupler, to wind the first twenty-six turns spaced, and all on one side. Spaced wiring means, that the distance between turns of wire is about equal to the size of the wire used. Naturally, the spacing could be a little greater and the results, especially on low waves, would be quite marked. When the coupler is all wound test it for continuity of circuit. It should now be ready for mounting upon the panel. A copper can, 4" square, is placed around this coupler, and the little Bakelite square (2½x2½") should be attached to the back of this can. Upon this piece of bakelite is mounted the General Radio tap switch and the three taps. Place the knob of the coupler upon the shaft and the coupler is ready for wiring into the circuit. I might mention, by the way, that this coupler can be "doped," using a good grade of flexible collection for the purpose.

The subpanel, at the back of the set, should now be screwed to the baseboard. Upon this mount the 6-ohm rheostat and the binding posts. Only one rheostat is to be mounted at this time; the other will come later. Next mount the double circuit jack in the top hole on the panel. Now come the three dials. With the three condensers all in mesh—the plates all in—set the dials so as to read 100, then tighten the set screw to the shaft.

Remove the nuts from the binding posts on the sockets and put a soldering lug

on every post. Put the nut back and tighten firmly, using a Spintite wrench.

Put all the binding posts on the sub-panel and then mount the Gem fuse holder behind the first can.

Now mount the A battery switch.

The first step of the assembly being completed, the parts are ready for wiring. If you use the colored wiring scheme you can easily trace the circuits if trouble comes. Solder all connections well, and if you use rosin core solder watch out for rosin joints, that is, where the wire is held by rosin but no connection is actually made with solder. You really need a good hot electric iron for soldering, and I know of no finer iron than a Vulcan. Make haste slowly and with all the care and patience at your command, as your wiring will reflect credit or discredit upon you in the form of results.

Leads coming out of the copper cans should be at the bottom, and only through a hole large enough to accommodate the wire itself, and possibly a piece of spaghetti that is acting as a protection for the wire. Do not attempt to pull two or three wires through one hole.

The three copper cans must be connected together and grounded on the minus A.

Those excellent Silver Marshall coils that are used in the Fenway may be obtained at most radio stores for all wavelengths from 50 to 600 meters. These coils are fitted with six contact buttons which make contact with six springs in the molded "socket" into which the coil is plugged. The form itself is molded Bakelite, 2" in diameter by three and one-quarter inches long, and has six large half round ribs on which the wire is wound. The actual contact between the wire and the ribs is very small, and as the ribs are quite high the wire is kept well away from the tubing itself. Inside the form, supported on two long brass springs, is a second coil form 1" in diameter, which makes an excellent variable pick-up coil for the Fenway. The Silver-Marshall antenna coil No. 110-A also has a small rotor within the main coil. In the Fenway this is used as a variable pick-up coil in the aerial circuit. The antenna will connect to one end of this coil (No. 1 on the Silver-Marshall "socket") and the ground to the other end, No. 2 on the same socket. The secondary coil or stator is in two sections, but one continuous winding. No. 3 is the top end of the coil, and this is connected to the grid of the first tube; No. 4 is the bottom end of this same coil and connects to No. 5 on the same form; No. 6 is the bottom end of the second coil and should be connected to the ground. The special Silver-Marshall coupler No. 111-A should be connected in the Fenway as follows: No. 1 (we're speaking of the "socket," No. 515, of course) goes to the rotor plates of the condenser C2, No. 2 connects to No. 4 and then to the ground, No. 3 to the grid of the socket and the stator plates of the condenser C3, No. 5 with the B battery plus, 45 volts; No. 6 to the plate of the oscillator tube socket.

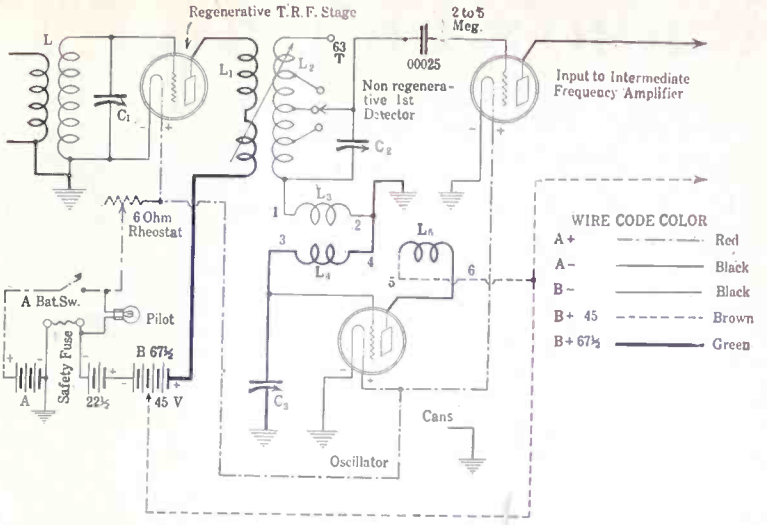


FIG. 1. The 2-to-5 meg. Leak goes from first detector grid to A+.

It is very important that all terminals on these Silver Marshall coils be scraped and sandpapered.

When the wiring is all completed put the first two tubes in the set, temporarily connect the plate of the first detector to one prong of the double circuit jack, the B plus 45 volts to the other prong (meaning outside prongs, of course) and the set thus far is ready to be tested.

What should you expect of the set so far? Well, if it won't work a speaker on high powered locals something's wrong somewhere. Perhaps it's the tubes. Have you made a mistake in the connections? Look them over carefully. The first two tubes of your set must be able to operate the speaker with fair volume on locals. It can be done. The writer's set does it! So do several others that have been built recently. No matter what ails your set, the trouble can be found by going after one thing at a time. The tube may be a "dud," the grid condenser or leak may need changing or one of the variable condensers may be shorted. Did you test each instrument before mounting?

If you are not close to a broadcasting station you will find that the home made wavemeter, shown in Fig. 6, will come in mighty useful. Doubtless you have enough "junk" around the house to build it, and the time it requires will be well spent. If you have already constructed this buzzer driven coil and condenser, place it near a short wire (or loop) that is connected to the set and in inductive relation to it. Now connect the battery, set the condenser at about 50 of the scale and listen with your phones, varying the tuning condenser C1 and the condenser C2. Somewhere around 50 on both condensers the signal from the buzzer should be picked up. If you don't get it retune the wavemeter, setting it, say, around 25, and again try to pick up the signal of the buzzer. If your first two tubes are functioning O. K. the signal will be heard over the entire scale.

And now, Mr. Radio Fan, bear in mind that New Yorkers who know a real radio receiver when they hear it are building the Fenway. They know that it is not an experimenter's set. They appreciate that it is a receiver for everybody. The fact that it is a 9-tube set may make the outfit seem complicated, but a multiplicity of tubes is essential if extremely distant stations are to be brought in with sufficient intensity to be enjoyed. However, the Fenway which is being described in these articles is something more than a 9-tube Super-Heterodyne. It is, in the language of the cigarette world, a whale as a 4-tube receiver. This is not theory; it has been proved continually in practice. You can do the same and incidentally own a receiver you will be proud to

(*Concluded on page 27*)

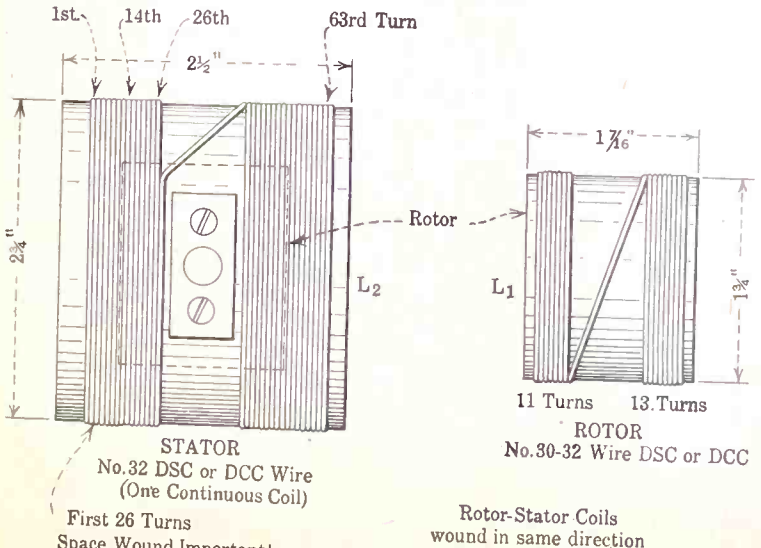


FIG. 4.

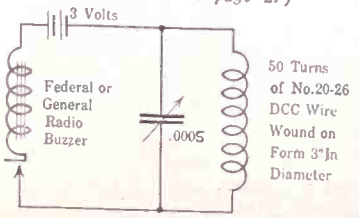


FIG. 6—Buzzer-driven coil and condonser which make ideal home-made wave meter for testing this set.

Radio's Future

By E. F. W. Alexanderson
Consulting Engineer, General Electric Company.

AMONG all the technical arts radio has given the greatest opportunity to the inventor. Each branch of engineering art has had its own eminent specialists who have created most of the new things that has been done in those arts, but radio has become a playground for all. It seems to be the favorite child of all the other technical arts and sciences, a meeting ground for exchange of mutual inspiration. There exist at least three generations of radio inventors. First, it behooves those of us who are of the second and third generations to pay tribute to those who gave us our original inspiration.

Opens a New Field

A new field of human endeavor has now been created. The originators were the most advanced thinkers in physical science and electrical engineering. But the most significant fact is the unprecedented rapidity with which this new knowledge has spread. In the now growing generation almost every high school boy, thanks to the popularity of radio, has some intimate knowledge of a complicated art which not long ago could be grasped only by very few.

As our civilization marches forward it makes inventions with an inevitable necessity. Inventors by habit and profession are simply the scouts who march ahead and become aware of new technical developments somewhat ahead of the multitude. A new event is usually seen by several of these scouts at nearly the same time. But these scouts are becoming more and more specialized and they are able to discern new phenomena only within the limited sphere in which they have been trained. The necessary training is in most cases an opportunity which has come only to a few among the many who might have accomplished the same.

The Future's Scope

If we should project into the future the growth of the electrical arts and sciences we can see the young art of radio growing up and taking a central position. **We think of radio now as a useful system of communication and a delightful form of entertainment but its greatest significance in the future will be its educational influence. Radio will be the school of training which will educate the engineers, inventors and scientists of tomorrow not by the thousands but by the millions.** If you will let loose your imagination what may you not expect from generations so trained? The future great discoveries regarding the nature of matter, energy and the universe will be made by those who have as boys been playing with electrons and probing the lengths and depths of space by radio waves.

The forces of nature will be harnessed on a scale not yet imagined in the form of electricity made into an indispensable servant in every village and farm, but the engineers who invent, plan and operate this new development will all be trained in the school of radio.

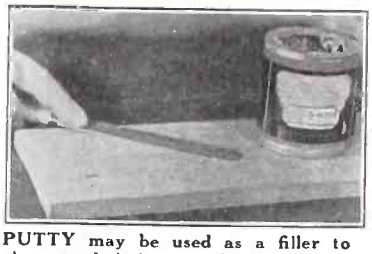
They will all speak the same technical language and their imagination will follow out the thoughts which were started in their early training.

Approves Personal Contacts

As an example of a school of thought that can dominate a technical art, we may think of Steinmetz' classical analysis of the magnetic field. Within the last year Dr. Pupin gave an inspiring lecture in Schenectady to the memory of Steinmetz in which he links up Faraday's and Maxwell's theory with the point of view current in electrical engineering and then again with the conception of wave-propagation as we understand it in radio. The truth underlying all these theories is the same, only we can look at it from different angles, but so long as the whole truth is only imperfectly understood, it makes a great deal of difference to us in the result of our endeavors of how we look at the problems we are dealing with.

Creative thought is passed along by personal contacts and I am sure it will prove to have been a significant decision when the Institute of Radio Engineers decided to hold its first convention to establish personal acquaintanceship between the older and younger generations devoting themselves to science and exploits of radio.

Dressing Up Baseboard



PUTTY may be used as a filler to plug up a hole in a wooden baseboard.

Too Bad

"HE'S soldering the pilot light to the positive B battery and may as well kiss three tubes good-bye. Too bad I can't talk or I'd tell him."

Droning Interference Puzzles Terrell and His Neighbors

WASHINGTON.

Fans who experience interference from non-radio sources have nothing on Chief Radio Supervisor W. D. Terrell. For more than a month, reception for Mr. Terrell has been almost completely spoiled by some unlocated interference. Mr. Terrell is not equipped with the apparatus necessary to locate the interference himself. He has not called upon the local radio supervisor to locate the interference because he believes his own case should not take precedence over the troubles of others.

Mr. Terrell lives in Livingstone Heights, Virginia, a suburb of Washington. For more than a month a continual drone produced in the receiver has spoiled his reception. He wonders whether the trouble is caused by an electric motor which operates the community pump, by one of the small motors used by oil burning furnaces in the neighborhood, by a leaky connection on the suburban electric line, or by sparking from the electric light wire. Mr. Terrell's neighbors are also troubled by the interference.

With a portable receiver it might be possible for Mr. Terrell to trace the interference to its source and have it removed.

Europe to Transmit to U. S. Through Daventry Station

The 20-kilowatt broadcasting station at Daventry is to be the clearing house of Europe for the exchange of programs with the United States and Canada. This plan was adopted as the result of the International Wireless Conference at Geneva. Daventry will be operated day and night, due to the difference in time between England and North America.

It was decided to have all high-power stations in Europe and eliminate low-power ones.

How to Tune a Set That Is Regenerative

Possessors of regenerative sets should be very careful not to manufacture oscillations, that is, should keep their sets below the squealing point, for the miniature transmission accomplished by squealing will become very annoying to neighbors, perhaps even to set owners for miles distant.

Speaker reception should not be attempted at first. Earphones should be plugged in at the speaker imput (last audio output, usually marked "speaker"), and then if a foreign station is heard on the earphones place on the speaker.

HERMAN BERNARD, managing editor of RADIO WORLD, broadcasts every Friday at 7 p. m., from WGBS, Gimbel Bros., N. Y. City, 315.6 meters. He discusses "What's Your Radio Problem?" Listen in!

Just the Thing

"This midnight jazz is the cat's!"

The Loud Boy—*DX Plainly Heard On Only One Tube*

By Herman Bernard
Associate, Institute of Radio Engineers

ONCE upon a time one saw variable condensers that had about 43 plates and were rated at .001 mfd. capacity. Do you remember the days? That value of capacity was extremely popular. But as receiver design improved and a higher ratio of inductance to capacity was thought advisable, such values as .00025 and particularly .00035 mfd. came into favor. Now the .00035 and the .0005 mfd. condensers are the most popular, and as they fall in nicely with schemes of space conservation they well deserve their hour.

But the .001 mfd. tuning condenser still has its use. It is in the antenna circuit. There are several ways of including it, but the one shown in Figs. 1 and 2 is as good as any.

The Aerial is Tuned

The condenser is used to tune the aerial circuit. The reason for the abnormal capacity is that it is perfectly normal in the position where it is incorporated. It is in the aerial circuit and the antenna system capacity is across it. To be sure the coil L would seem to be short-circuiting that antenna capacity, but that is not quite the case. The inductances L and and L1 are in the antenna-ground system, and the aerial-ground capacity plays its important part in that lead, this joint contribution constituting the reactance of the circuit. A .0005 mfd. condenser might be used instead of .001 mfd., if one were sure of what one's aerial capacity was, but the .001 gives a wider margin of safety.

The object of the large capacity tuning condenser is to insure a sufficient ratio between maximum and minimum capacity, so that the entire broadcast band will be tuned in. With the antenna system capacity as the starting point—plus the minimum capacity of the aerial condenser and the inductance of the coils L and L1—one had better rely on .001.

An Advantage

Granting all that, one may ask why it is necessary to include the tuned aerial system. It is not necessary, merely very advantageous. When one is operating on only one tube he must suffer limitations, one of which frequently is the absence of sufficient volume to sustain enjoyment of distant programs. A stage of audio-amplification would cure that, but the problem here discussed is confined solely to the 1-tube set.

The tuning of the aerial system is conducted on much the same lines as that of the regulation tuned secondary circuits. All forms of tuning are in fact wave traps, either of the acceptor or rejector types. The rejector is a negative attribute. It keeps out something you don't want. It is an enemy of interference. Usually it also causes a drop in volume in the signal being received. The acceptor type, as in Figs. 1 and 2, is more helpful, although along different lines.

No Compromise

It is well known that the untuned primary is a compromise, in that best coupling exists over only a narrow band of wavelengths. It is very fine in tuned radio-frequency sets, and the like, where the overall radio-amplification is high, but in the 1-tube set it is well to be able to put the primary circuit in best condition for each individual wavelength. Thus the hookups published herewith will do very nicely. You can prove it, for unless the aerial tuning condenser is turned to the correct setting, either the station will not be heard at all—which would be true of

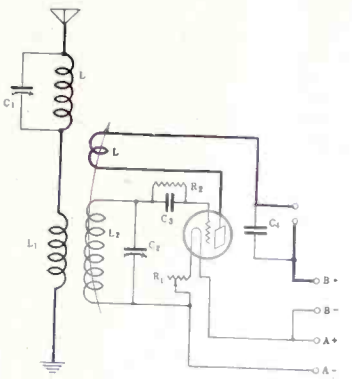


FIG. 1, wiring diagram of the receiver in schematic form, showing grid return to negative A, which works well on only a very few types of tubes, not including the 99.

a distant station—or on locals the volume would be lessened. Hence even C1 may be calibrated or logged and its setting does not noticeably affect the setting of C2, the secondary tuning condenser. This does away with the troublesome aspect of other forms of aerial tuning, whereby compensation in the secondary circuit gives the same effect of multiple settings for a given station as is experienced with Super-Heterodynes, although of course the reason is different.

A Simple Circuit

The circuit is inherently simple. Any one familiar with radio can construct it from Fig. 1, (modifying the grid return if necessary) while the novice will find himself content in penetrating the delineations in Fig. 2. Indeed, possessors of 3-circuit tuners of the most prevalent varieties will be able to change over their receiver to this one in a few minutes. The C1-L combination may be placed in a separate little cabinet, to appease change-over instincts, or an existing receiver may be rebuilt on a larger panel to make room for this contraption.

Uses a 7x14" Panel

A comfortable panel for this set would be 7x14" and it would be so laid out that the aerial tuning condenser is at left, the secondary tuning condenser at right, and the 3-circuit tuning coil, L1L2L3, in center. Between the 3-circuit coil and C1 would be the rheostat, R1. The jack is placed at the opposite point. The tickler would not require a dial. A small knob would suffice, or a 2" dial, while 4" vernier dials should be used on the two condensers.

A baseboard, if used, would be 8x13", secured to the panel bottom by woodscrews. The coil L would be placed horizontally, 3" behind the end plate of C1, while the 3-circuit coil would be mounted perpendicularly on the panel. A socket shelf 2½x13" would be just as suitable.

Coil Data

L1L2L3 may be a commercial 3-circuit tuning coil, the capacity of C2 depending on the coil used. Most often this would be .0005 mfd. For those desiring to wind their own 3-circuit coil, a 3" diameter stator form, 4" high, may be employed, the primary L1 consisting of 10 turns. Leave ¼" space, then wind 45 turns for the secondary L2. The tickler is wound on a 2" diameter, 2" high and consists of 22 turns. The wire is No. 24 double cotton covered. It is often more convenient to use smaller wire on the tickler, say No. 26, for it doesn't matter there, on the resistance score. As a shaft must penetrate the stator and be secured to the rotor, part of the rotor winding will be separated at least the width of this shaft, and finer wire makes it easier to put on enough turns to get regeneration on the highest receivable wave.

The secondary is to be tuned with .0005 mfd. For .00035 use 55 turns, for .001 use 33.

As for the coil L, that will require some experimenting. My own aerial has a capacity of .00027 and the proper coil, in conjunction with a .001 condenser for C1, happened to be one comprising 31 turns on a 3" diameter tubing, No. 24 DCC wire being used. But some antenna systems will require a greater number of turns, some a lesser number. It is a good plan to put on 40 turns, then peel 'em off, as necessity dictates. Once you reach your goal, stop, of course. The point is, when is that goal reached? Why when you can tune from 200 to 555 meters. On the higher wavelengths the readings of C1 should not vary greatly from those of C2, if C2 is .0005 mfd.

The —99 Type Tube Suitable

The set operates efficiently on any of the popular types of tubes, including dry-cell tubes. While the picture diagram shows a storage A battery, that is not necessary, and it is assumed that constructors of 1-tube sets are keener for dry-cell operation. The —99 type of tube is excellent for the set and requires only a 4½-volt A battery (the conventional C battery used as an A battery). The B battery may be 22½ volts, but greater volume may be expected if 45 volts are used.

C4 is not always necessary, depending largely on the tube characteristics and the phone windings. It is a bypass condenser, .00025 or .0001 mfd. The rheostat for the —99 type of tube should be 20 ohms.

Panel and Baseboard

Mount the condenser C1 on the panel, also the condenser C2. Then mount the coil in the center and next put on the rheostat and jack. Put the baseboard temporarily against the panel bottom and provisionally place the coil L, and the socket. The coil is at left, behind the first condenser, the socket at right. The

(*Continued on next page*)

LIST OF PARTS

One impedance coil, L.
One 3-circuit tuning coil, L1L2L3.
One .001 mfd. variable condenser, C1.
One .0005 mfd. variable condenser, C2.
One .00025 mfd. grid condenser, with clips, C3.
One .00025 mfd. fixed condenser, C4.
One single-circuit jack.
One 20-ohm rheostat, R1.
One 5-meg. grid leak, R2.
One —99 socket.
One 7x14" panel.
Two 4" vernier dials.
One 2" dial or knob.
One 5-lead battery cable.
Accessories: One 4½-volt A battery, usual C battery serving the purpose; one —99 type tube; one 45-volt B battery; one pair of phones; one cabinet to match panel and baseboard sizes; 100 ft. aerial wire, 50 ft. No. 14 insulated leadin wire; two aerial insulators; one leadin insulator; one lightning arrestor; one ground clamp. Note: The use of a —99 tube is presupposed. If other type of tube is used make necessary substitution of equipment.

How to Wire the 1-tube Set That Brings in Loud DX

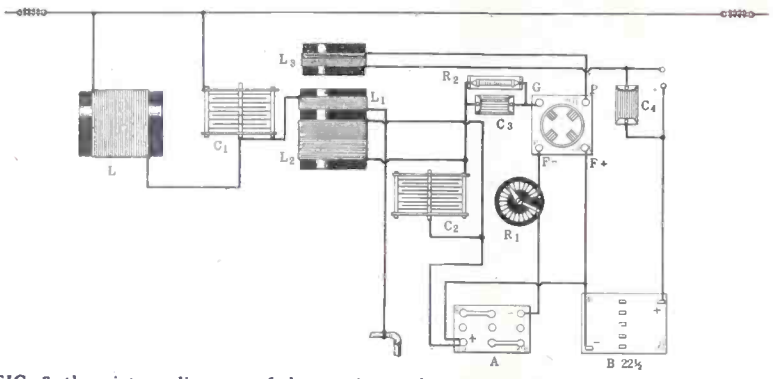


FIG. 2, the picture diagram of the receiver, which will be of material assistance to novices who desire to construct the voluminous DX set described in the accompanying article.

(*Continued from preceding page*)
aerial post will be at left rear, the ground post at rear center. A battery cable avoids the necessity of binding posts.

Wiring Directions

Connect the A battery wiring on the baseboard parts first. Join A battery plus to the F plus post of the socket and to the rotary plates of C2. Connect A minus to one side of the rheostat, R1, the other side of R1 to the F minus post of the socket. The —99 type tubes have their filament, grid and plate posts differently positioned from the standard base tubes, so see that you correctly read the post designation on the socket.

After mounting L, connect aerial to one of L's terminals and to the stator of C1, while the rotor of C1 and the remaining terminal of L go to the beginning of the primary L1, the end of which goes to ground.

The end of the secondary goes to the lead that was connected to the rotary plates of C2 (the A plus lead), while the other terminal of L2 goes to one side of the grid condenser, C3. The other terminal of C3 is connected to the grid post of the socket, marked G on the socket. Across the grid condenser, which has mounting or clips for the purpose, is placed the grid leak, normally 2 meg., although the —99 type tube will stand a higher value of resistance, say 5 meg. The plate post of the socket, marked P, goes to one terminal of L3, the other terminal of which is connected to the hooked spring of the jack. In Fig. 1 the jack posts are designated by circles. The other jack leaf goes to B plus. Across the phones, that is, from one jack spring to the other, is connected the fixed condenser C4.

It will be noted that in the picture diagram (Fig. 2) and in the text the grid return is designated as A plus, and this is correct for nearly all tubes, although in some few instances the grid return to A minus, as shown in Fig. 1, will work better.

The correct return is important.

SOS Two Nights in Row Hampers Overseas Tests

DISTRESS calls halted the broadcasting of the International Test programs from most United States stations during the first two nights of International Week. On the first night, the SOS call was sent out by a ship off the Delaware Breakwater. This caused all the stations in the Eastern section of the country to keep silent for 50 minutes of the hour between 10 and 11 p. m. This time was allotted to American stations to broadcast their programs, so that folk in Europe, South America, etc., might try to catch the signals.

On the second night of the test SOS calls again halted American broadcast transmissions. This time three hours elapsed before broadcasting was resumed. Only 23 minutes were left for the stations to broadcast during the 10 to 11 p. m. period. The British freighter, Laristan, carrying a crew of 22 men, was one of the ships reported in distress in mid-Atlantic. This freighter carried a cargo of coal. The storm was the second severest one this winter and worse than the one reported last month.

Operators on steamships nearing New York experienced difficulty in making out the calls that were sent out for assistance, because of the messages that were being broadcast and relayed from one ship to another, while the shore stations at Halifax and Cape Race chimed in at frequent intervals, adding to the confusion.

It was through this mixup in the air that the SOS from the British freighter Laristan sent out and finally relayed by the Aquitania, did not reach New York until three hours later and caused the broadcasting from the Eastern radio stations to be closed down.

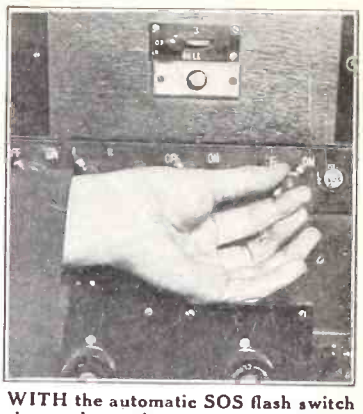
Many folk, upon hearing that the station will have to stand-by due to the receiving of an SOS, become irritated, provoked, exasperated and what-not. What an awful thing to have to wait for the program to continue, so that help may be obtained for a stricken vessel at sea!

The disappointment may be great, but no radio operator wishes to pound SOS with the key. He would rather sit back and send messages of happiness for all those on board all day long, than have to send for one minute a distress signal.

Imagine being on a vessel with the water in the fire room, with the water pumps all out of order and with the steering wheel smashed. Imagine being in the radio room, pounding the key for help, with water pouring in so fast that you cannot sit on the stool without being thrown off. Imagine the antenna wire being blown down. Imagine going out into the sleet and rain and climbing the icy poles, with the wind blowing at a velocity of 70 miles an hour, so that the wire may be tightened. Imagine all the lifeboats being smashed and nothing else to do but jump, if help does not come.

Just imagine these dreadful things, all of which are frequent incidents during storms on freighters and even passenger liners. You will then realize what a grateful person you ought to be for being where you are, the only type of difficulty encountered by you being that all stations have ceased broadcasting during a test program. You have just to push the switch in, but those folks aboard the ship have to fight for their lives. Realize that every time an SOS is sent out, lives are at stake. Ceasing of broadcasting of programs for testing is but a minute matter in comparison with an SOS signal (L. W.)

Flash Switch Reveals SOS



WITH the automatic SOS flash switch shown above, the operator at a broadcasting station can instantly notice if a distress signal is in the air and notify the announcer. This switch is used by WEAF. The system is much better than the old one, where the operator had to sit with the phones on his head to catch this signal.
(Kadel & Herbert)

THE sudden shutting off of the broadcasting stations, due to an SOS call being heard by the operator in charge, facilitates the rescue of lifeboat refugees. Here we see the crew of the Italian freighter Ignacio Florio being taken away in a lifeboat by the members of the American liner "President Harding." Just a few moments after the crew was rescued, the ship was completely submerged.
(Kadel & Herbert)

The Official List of Stations By Wavelength and Frequency

With power in Watts, Call Letters, Location and Name of Owner given in that order, left to right.

[The wavelength and frequency, at left in the following list, are given once, for the first station on that wave, the stations that follow being on the same wave, until the next channel is reached. Then the next highest wave is given. An exception is that the wave is repeated at the top of a new column.]

Wave Length	Frequency (Kilocycles)	Power (Watts)	Call Letters	Location and Owner of Station
202.6	1480	500	KFBX	Big Bear Lake, Calif., Bertram O. Heller.
		20	WIBS	Elizabeth, N. J., New Jersey Nat. Guard, Headquarters Co. 57th Infantry Brigade.
		20	WEHS	Evanston, Ill., Robert E. Hughes.
205.4	1460	10	KFYF	Oxnard, Calif., Carl's Radio Den (Newcomb Radio Co.)
		50	KFXY	Flagstaff, Ariz., Mary M. Costigan.
		100	WFRL	Brooklyn, N. Y., Robert M. Lacey (Flatbush Radio Laboratory).
		50	WPDQ	Buffalo, N. Y., Hiram D. Turner.
		10	KFXD	Logan, Utah, L. H. Strong.
		10	WOCG	Sycamore, Ill., Triple Alliance Radio Station.
		5	WIBX	Utica, N. Y., Grid-Leak, Inc.
		5	WIBQ	Farina, Ill., F. M. Schmidt.
		50	KFVD	San Pedro, Calif., McWhinnie Electric Co.
		30	WCBR	Providence, R. I. (portable), Charles H. Messter.
205.8	1450	500	KFWM	Oakland, Calif., Oakland Educational Society.
		50	WJBA	Joliet, Ill., D. H. Lentz, Jr.
		50	WABW	Wooster, Ohio, College of Wooster.
208.2	1440	250	KNRC	Hollywood, Calif., Clarence B. Juneau.
209.7	1430	500	WBNY	New York, N. Y., Shirley Katz.
		100	KFXC	Santa Maria, Calif., Santa Maria Valley R. R. Co.
		500	WSBC	Chicago, Ill., World Battery Co.
		5	KRVU	Eureka, Calif., Standard Publishing Co.
		5	WIBH	New Bedford, Mass., Elite Radio Stores.
		100	KDZB	Bakersfield, Calif., Frank E. Siefert.
211.1	1420	250	KFWC	Upland, Calif., L. E. Wall.
		250	KFWO	Avalon, Calif., Lawrence Mott.
212.6	1410	500	KQP	Portland, Ore., H. B. Read.
		15	WMAL	Washington, D. C., M. A. Leese Optical Co.
		500	WWGL	Richmond Hill, N. Y., Radio Engineering Corp.
		50	KFWV	Portland, Ore., Wilbur Jerman.
214.3	1400	100	WKBB	Joliet, Ill., Sanders Bros.
		10	KFWP	Brownsville, Tex., Rio Grande Radio Supply House.
		150	WCLS	Joliet, Ill., H. M. Church.
		250	KFWP	St. Louis, Mo., St. Louis Truth Center.
		10	KFAW	Santa Ana, Calif., The Radio Den.
215.7	1390	250	WRST	Bay Shore, N. Y., Radiotel Mfg. Co.
		100	WPRC	Harrisburg, Pa., Wilson Printing & Radio Co.
		10	KFXJ	Portable Station, Colo., Mountain States Radio Distributors, Inc.
		50	WBBZ	Chicago, Ill. (portable), C. L. Carrell.
		100	WKBG	Chicago, Ill., C. L. Carrell.
		10	WIBM	Chicago, Ill., Billy Maine.
		50	WHBL	Logansport, Ind. (portable), James H. Slusser.
		50	WIBJ	Chicago, Ill. (portable), C. L. Carrell.
		100	WIBW	Philadelphia, Pa., D. R. Kienzle.
		20	WIBR	Cincinnati, Ohio, Scientific Electric & Mfg. Co.
		50	KFOW	North Bend, Wash., F. C. Knierim.
217.3	1380	5000	WOK	Homewood, Ill., Neutrowound Radio Mfg. Co.*
		100	KFQU	Holy City, Calif., W. Riker.
		500	WFKB	Chicago, Ill., Francis K. Bridgman.
		10	WJD	Granville, Ohio, Denison University.
		10	KFRX	Pullman, Wash., J. Gordon Klemgard.
218.8	1370	250	WJBI	Red Bank, N. J., Robert S. Johnson.
		10	WHBU	Anderson, Ind., Riviera Theatre & Bing's Clothing.
		50	WIBI	Flushing, N. Y., Frederick B. Zittell, Jr.
		10	KFJC	Junction City, Kans., R. B. Fegan (Auspices Episcopal Church).
		50	KFRW	Olympia, Wash., United Church of Olympia.
		15	KFVH	Manhattan, Kans., Whan Radio Shop.
220	1360	5	KJBS	San Francisco, Calif., Julius Brunton & Sons Co.
		100	WIBW	Logansport, Ind., Dr. L. L. Dill.
		500	WQAA	Parkesburg, Pa., Horace A. Beale, Jr.
222	1350	20	WIBU	Poynette, Wis., The Electric Farm.
		50	WIBG	Elkins Park, Pa., St. Paul's P. E. Church.
		100	WIBC	St. Petersburg, Fla., L. M. Tate Post No. 39 Veterans of Foreign Wars.
		100	WHBH	Culver, Ind., Culver Military Academy.
		100	WIBF	Rock Island, Ill., Beardsley Specialty Co.
		20	WHBD	Bellefontaine, Ohio, Charles W. Howard.
		100	WBES	Takoma Park Md., Bliss Electrical School.
		15	KFRZ	Hartington, Nebr., The Electric Shop.
		50	WBBW	Norfolk, Va., Raffner City High School.
224	1340	10	WJBG	Charlotte, N. C., Interstate Radio, Inc.
		50	WKAV	Laconia, N. H., Laconia Radio Club.
		250	WODA	Paterson, N. J., O'Dea Temple of Music.
		50	KFVS	Cape Girardeau, Mo., Cape Girardeau Battery Station.
		10	KFBC	San Diego, Calif., W. K. Azbill.
		50	KFUU	San Leandro, Calif., Colburn Radio Laboratories.
		50	KFUR	Ogden, Utah, H. W. Peery and Redfield.
		10	WBBU	Monmouth, Ill., Jenks Motor Sales Co.
		10	WRAF	Laporte, Ind., Radio Club, Inc.
		100	KFBL	Everett, Wash., Leese Bros.
226	1330	1500	WBBM	Chicago, Ill., Atlass Investment Co.*
		1000	WIBO	Chicago, Ill., Nelson Bros.*
		500	KFWI	South San Francisco, Calif., Radio Entertainments, Inc.
		50	KFOB	Burlingame, Calif., Burlingame Chamber of Com.
		150	WDAD	Nashville, Tenn., Dad's Auto Accessories, Inc.
		50	KFQZ	Hollywood, Calif., Taft Radio Co.
		10	KFKZ	Kirksville, Mo., F. M. Henry.
		10	WEBQ	Harrisburg, Ill., Tate Radio Co.
		100	WEBM	New York, N. Y. (portable), Radio Corp. of Amer.
		20	WBBA	Newark, O., Plymouth Congregational Church.
		10	WFBE	Seymour, Ind., John Van De Walle.
		100	WEBL	Portable Station, Radio Corp. of America.

Wave Length	Frequency (Kilocycles)	Power (Watts)	Call Letters	Location and Owner of Station
226	1330	100	KFUR	David City, Nebr., David City Tire & Electric Co.
		10	KFIC	Juneau, Alaska, Alaska Electric Light & Power Co.
		10	KFQQ	Boone, Ia., Crary Hardware Co.
227	1320	10	KFXM	Beaumont, Tex., Neches Electric Co.
		500	WOWO	Fort Wayne, Ind., Main Auto Supply Co.
		50	KFVA	Welcome, Minn., Carl E. Bagley.
		100	WDBK	Cleveland, Ohio, W. F. Bros Furniture, Hardware & Radio Store.
229	1310	50	KFXV	Santa Rosa, Calif., L. A. Drake Battery & Radio Supply Shop.
		10	WGBC	Marshfield, Wis., Marshfield Broadcast Ass'n.
		250	WSAJ	Grove City, Pa., Grove City College.
		50	KPPC	Pasadena, Calif., Pasadena Presbyterian Church.
		100	WSAN	Allentown, Pa., Allentown Call Publishing Co.
		150	WBBL	Richmond, Va., Grace Covenant Presbyterian Ch.
		100	KFLV	Rockford, Ill., Swedish Evangelical Mission Church.
		50	WDBJ	Roanoke, Va., Richardson-Wayland Electrical Corp.
		10	WAIT	Taunton, Mass., A. H. Waite & Co.
		50	WCBM	Baltimore, Md., Hotel Chapeau.
231	1300	500	KQW	San Jose, Calif., First Baptist Church.
		50	WCLO	Camp Lake, Wis., C. E. Whitmore.
		50	WTAX	Streator, Ill., Williams Hardware Co.
		20	WNAR	Butler, Mo., First Christian Church.
		10	WLAX	Greencastle, Ind., Greencastle Community Broadcasting Station.
		100	WKBE	Webster, Mass., K. & B. Electric Co.
		10	WHIZ	Montgomery, Ala., Powell Electric Co.
		10	WHIK	Ellsworth, Me., Franklin St. Garage, Inc.
		20	WHBG	Harrisburg, Pa., John S. Shane.
		100	WBRE	Wilkes-Barre, Pa., Baltimore Radio Exchange.
		100	KFQC	Taft, Calif., Kidd Bros. Radio Shop.
		500	KFPR	Los Angeles, Calif., Los Angeles County Forestry Department.
		50	KFOT	Wichita, Kans., College Hill Radio Club.
		10	KFDZ	Minneapolis, Minn., Harry O. Iverson.
		5	KDLR	Devils Lake, N. Dak., The Radio Electric Co.
233	1290	15	WEBA	Highland Park, N. J., The Electric Shop.
		10	WJBK	Ypsilanti, Mich., Ernest F. Goodwin.
		50	WOKO	New York, N. Y., Otto Baur.
		100	KFON	Long Beach, Calif., Echophone Radio Shop.
		50	WHBQ	Memphis, Tenn., Men's Fellowship Class of St. John's M. E. Church, South.
		20	WHBM	Chicago, Ill. (portable), C. L. Carrell.
		10	KFEY	Kellogg, Ida., Bunker Hill & Sullivan Mining & Concentrating Co.
		100	WHAG	Cincinnati, Ohio, University of Cincinnati.
		10	WDBZ	Kingston, N. Y., Boy Scouts of America, Ulster County Council.
234	1280	100	WFDF	Flint, Mich., Frank D. Fallain.
		50	KGTT	San Francisco, Calif., Glad Tidings Tabernacle.
		100	WJBC	La Salle, Ill., Hummer Furniture Co.
		50	WHBJ	Fort Wayne, Ind., Lauer Auto Co.
		100	WGBQ	Menomonie, Wis., Stout Institute.
		30	WGBM	Providence, R. I., Theodore N. Saaty.
		50	WKAP	Cranston, R. I., Dutee W. Flint.
		10	WEBE	Cambridge, Ohio, Roy W. Waller.
		50	KFUP	Denver, Colo., Fitzsimmons General Hospital.
		5	WFBD	Philadelphia, Pa., Gethsemane Baptist Church.
		10	WDBQ	Salem, N. J., Morton Radio Supply Co.
		100	WQAC	Amarillo, Tex., Gish Radio Service.
		50	KMJ	Fresno, Calif., San Joaquin Corp.
236	1270	10	KFXE	Waterloo, Iowa, Electrical Research & Mfg. Co.
		100	WRMU	New York, N. Y. (Yacht Mu-I), A. H. Grebe & Co.
		50	WTAD	Carthage, Ill., Robert E. Compton.
		100	WGMU	Richmond Hill, N. Y. (portable), A. H. Grebe & Co.
		100	WBOQ	Richmond Hill, N. Y., A. H. Grebe & Co.
		10	KFVX	Bentonville, Ark., The Radio Shop.
		250	KFOO	Salt Lake City, Utah, Latter Day Saints University.
		100	KWKC	Kansas City, Mo., Wilson Duncan Studios.
		100	WGBF	Evansville, Ind., Finke Furniture Co.
		10	KFVG	Independence, Kans., First Methodist Episcopal Church.
		100	WIBA	Madison, Wis., Capital Times Studio.
		50	WFBJ	Collegeville, Minn., St. Johns University.
		250	WFBI	Camden, N. J., Galvin Radio Supply Co.
		100	WCBQ	Nashville, Tenn., First Baptist Church.
		10	KFLU	San Benito, Tex., San Benito Radio Club.
238	1260	2000	WHT	Deerfield, Ill., Radiophone Broadcasting Corp.
		10	KFYJ	Houston, Tex. (portable), Houston Chronicle Publishing Co.
		15	KFBS	Trinidad, Colo., School District No. 1.
		100	KFWU	Pineville, La., Louisiana College.
		10	WHBN	St. Petersburg, Fla., First Ave. Methodist Church.
		200	WBBP	Petoskey, Mich., Petoskey High School.
		250	WOUW	Worcester, Mass., Clark University.
		500	KFPG	Los Angeles, Calif., Oliver S. Garretson & K. M. Turner Radio Corp.
		100	KFCB	Phoenix, Ariz., Nielson Radio Supply Co.
		10	WRAW	Reading, Pa., Horace D. Good.
240	1250	100	KZM	Oakland, Calif., Western Radio Inst.
		100	WABI	Bangor, Me., First Universalist Church.
		100	KTAB	Oakland, Calif., Tenth Ave. Baptist Church.*
		10	KFVI	Houston, Tex., Headquarters Troop, 56th Cavalry Brigade.
		10	KFHL	Oskaloosa, Ia., Penn College.
		10	KFLX	Galveston, Tex., George R. Clough.
		500	KFVE	St. Louis, Mo., Film Corporation of America.
		50	WCAT	Rapid City, S. Dak., South Dakota School of Mines.

(Continued on next page)

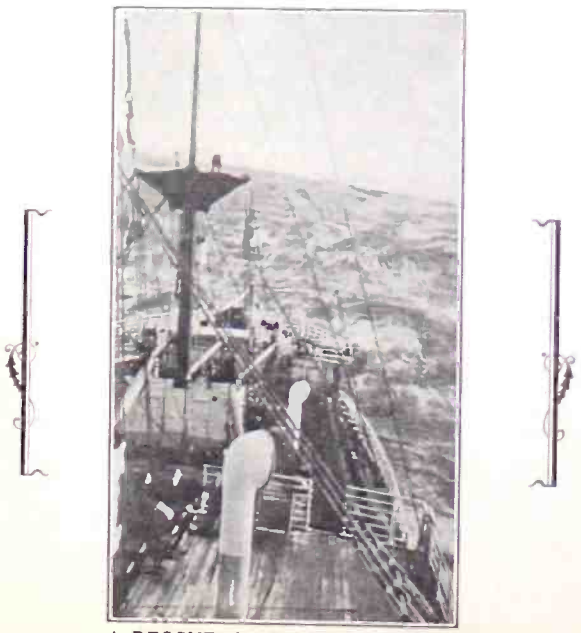
Wave Length	Frequency (Kilocycles)	Power (Watts)	Call Letters	Location and Owner of Station
240	1250	100	WDBO	Winter Park, Fla., Rollins College.
		10	WGBI	Scranton, Pa., Frank S. Megargee.
		100	WHAP	N. Y. C., N. Y., William H. Taylor Finance Corp.
		500	WOAX	Trenton, N. J., Franklyn J. Wolff.
		20	WSMH	Owosso, Mich., Shattuck Music House.
242	1240	10	KOFJ, KFOS	Moberly, Mo., Moberly High School.
		500	KSO	Clarinda, Iowa, A. A. Berry Seed Co.
		50	KFXH	El Paso, Tex., Bledsoe Radio Co.
		50	KFRM	Fort Sill, Okla., James P. Boland, Lt. U. S. A.
		250	WBZA	Boston, Mass., Westinghouse Electric & Mfg. Co.
245	1230	100	WNAX	Yankton, S. Dak., Dakota Radio Apparatus Co.
		100	WRAM	Galesburg, Ill., Lombard College.
		50	WSAZ	Pomeroy, O., Chase Electric Shop.
		100	WTAT	Boston, Mass. (portable), Edison Electric Illuminating Co. of Boston.
		100	WGBB	Freeport, N. Y., Harry H. Carman.
		100	WEBR	Buffalo, N. Y., H. H. Howell.
		250	KUOM	Missoula, Mont., State University of Montana.
		500	WAMD	Minneapolis, Minn., Hubbard & Co.
		50	KFVR	Denver, Colo., Moonlight Ranch Broadcasting Station.
246	1220	50	KDYL	Salt Lake City, Utah, Newhouse Hotel.
		50	WIBR	Weirton, W. Va., Thurman A. Owings.
		500	KFVW	San Diego, Calif., Airfan Radio Corp.
		10	KFJI	Astoria, Ore., Liberty Theatre.
		500	WABX	Mt. Clemens, Mich., Henry B. Joy.
		5	KGY	Lacey, Wash., St. Martins College.
		50	WQAE	Springfield, Vt., Moore Radio News Station.
		50	WCAZ	Carthage, Ill., Carthage College.
		500	WSOE	Milwaukee, Wis., School of Engineering of Milwaukee.
		15	WEBD	Anderson, Ind., Electrical Equipment & Service Co.
		50	KFJY	Fort Dodge, Ia., Tunwall Radio Co.
248	1210	500	WAPI	Auburn, Ala., Alabama Polytechnic Institute.
		50	WBRC	Birmingham, Ala., Bell Radio Corp.
		50	KWG	Stockton, Calif., Portable Wireless Telephone Co.
		100	WCSO	Springfield, O., Wittenberg College.
		100	KFBK	Sacramento, Calif., Kimball-Upson Co.
		100	WMAY	St. Louis, Mo., Kingshighway Presbyterian Church.
		5	WGBK	Johnstown, Pa., Lawrence W. Campbell.
		100	WEW	St. Louis, Mo., St. Louis University.
		100	KFIF	Portland, Ore., Benson Polytechnic Institute.
		250	KFRB	Beeville, Tex., Hall Brothers.
		100	WBBG	Mettapoisett, Mass., Irving Vermilya.
		50	KFEC	Portland, Ore., Meier & Frank Co.
		100	KFOX	Omaha, Nebr., Technical High School.
		10	WGAL	Lancaster, Pa., Lancaster Electric Supply & Con. Co.
		10	KFJB	Marshalltown, Iowa, Marshall Electric Co.
250	1200	500	WMBB	Chicago, Ill., American Bond & Mortgage Co.
		150	KUO	San Francisco, Calif., Examiner Printing Co.
		250	KLS	Oakland, Calif., Warner Bros. Radio Supply Co.
		500	KFXF	Colorado Springs, Colo., Pikes Peak Broadcasting Co.
		100	KFKQ	Conway, Ark., B. H. Woodruff.
		10	KFVY	Albuquerque, N. Mex., Radio Supply Co.
		500	KFGX	Orange, Tex., First Presbyterian Church.
		100	WNAB	Boston, Mass., Shepard Stores.
		500	WGES	Oak Park, Ill., Oak Leave Broadcast Station.
		50	WHBY	West De Pere, Wis., St. Norbert's College.
		150	WLAL	Tulsa, Okla., First Christian Church.
		100	WIAD	Philadelphia, Pa., Howard R. Miller.
		500	KRPM	Cleveland, O., Westinghouse Electric & Mfg. Co.
		100	WCAX	Burlington, Vt., University of Vermont.
		10	WHBA	Oil City, Pa., Shaffer Music House.
		100	KMO	Tacoma, Wash., Love Electric Co.
		50	KFBC	Tacoma, Wash., First Presbyterian Church.
		100	KGB	Tacoma, Wash., Daily Ledger.
		100	KFFV	Lamoni, Ia., Graceland College.
		250	WWAD	Philadelphia, Pa., Wright & Wright.
		100	KFDX	Shreveport, La., First Baptist Church.
		100	WQAN	Scranton, Pa., Scranton Times.
		50	WFBC	Knoxville, Tenn., First Baptist Church.
		100	WNAT	Philadelphia, Pa., Lennig Bros. Co.
252	1190	50	WRCO	Raleigh, N. C., Wynne Radio Co.
		50	WRHM	Minneapolis, Minn., Rosedale Hospital.
		100	WNJ	Newark, N. J., Radio Shop of Newark.
		500	WGCP	Newark, N. J., D. W. May, Inc.
		500	KFWB	Hollywood, Calif., Warner Bros. Pictures, Inc.
		100	WGBX	Orono, Me., University of Maine.
		100	WSRO	Hamilton, Ohio, Radio Co. (Harry W. Fahrlander).
		100	WFBL	Syracuse, N. Y., Onondaga Hotel.
		50	KFOY	St. Paul, Minn., Beacon Radio Service.
		10	WTAL	Toledo, O., Toledo Radio & Electric Co.
		50	KWUC	Le Mars, Ia., Western Union College.
		50	WBBS	New Orleans, La., First Baptist Church.
		200	KOCW	Chickasha, Okla., Oklahoma College for Women.
		15	KFPL	Dublin, Tex., C. C. Baxter.
		10	KFOT	Denison, Tex., Texas National Guard, 36th Signal Co.
		50	KFHA	Gunnison, Colo., Western State College of Colorado.
254	1180	50	KFIZ	Fort Worth, Tex., Southwestern Baptist Theo. Sem.
		10	WIRB	St. Petersburg, Fla., I. W. McClung.
		15	WCBA	Allentown, Pa., C. W. Heinbach.
		20	WABC	Asheville, N. C., Asheville Battery Co.
		100	KFWH	Chico, Calif., F. Wellington Morse, Jr.
		500	WCAJ	University Place, Nebr., Nebraska Wesleyan Univ.
		500	WEAJ	Ithaca, N. Y., Cornell University.
		250	WNAD	Norman, Okla., University of Oklahoma.
		10	WHBC	Canton, O., Rev. E. P. Graham.
		500	KFDI	Corvallis, Ore., Oregon Agricultural College.
		100	WIAS	Burlington, Ia., Home Electric Co.
		20	WEBZ	Galesburg, Ill., Knox College.
		100	WFBR	Baltimore, Md., Fifth Infantry, Maryland National Guard.
		100	KFER	Albuquerque, N. Mex., University of New Mexico.
		50	KFEL	Denver, Colo., W. L. Winner Radio Shop.
		10	WREC	Coldwater, Miss., Wooten's Radio & Electric Co.
		100	WTAO	Osseo, Wis., S. H. Van Gorden & Son.
		100	WIAK	Greentown, Ind., Rev. C. L. White.
		100	WSAR	Fall River, Mass., Doughty & Welch.
256	1170	500	KTNT	Muscatine, Iowa, Norman Baker.
		100	WMBC	Detroit, Mich., Michigan Broadcasting Co.
		50	KFIS	Oakland, Calif., Louis L. Sherman.
		100	KRE	Berkeley, Calif., Berkeley Gazette.
		110	WJBN	Sycamore, Ill., St. John's Evangelical Lutheran Church.
		100	WDCH	Hanover, N. H., Dartmouth College.
		10	WGBW	Spring Valley, Ill., Valley Theatre.
		500	WCSH	Portland, Me., Henry P. Rines.
		50	WDOD	Chattanooga, Tenn., Chattanooga Radio Co.
256	1170	100	WHBP	Johnstown, Pa., Johnstown Automobile Co.
		100	KFAU	Yakima, Wash., First Methodist Church.
		100	KFCF	Walla Walla, Wash., Frank A. Moore.
		50	WRHF	Washington, D. C., Washington Radio Hosp. Fund.
		5	WEBT	Dayton, Ohio, Dayton Cooperative Industrial High School.
		100	WBAX	Wilkes-Barre, Pa., John H. Stenger, Jr.
		50	WBDC	Grand Rapids, Mich., Baxter Laundry Co.
		100	WRAK	Escanaba, Mich., Economy Light Co.
258	1160	100	WLTS	Chicago, Ill., Lane Technical High School.
		500	WRNY	New York, N. Y., Experimenter Publishing Co.
		20	KFPW	Carterville, Mo., St. John's M. E. Church, South.
		500	WADC	Akron, Ohio, Allen Theatre (Allen T. Simmons).
		100	WHEC	Rochester, N. Y., Hickson Electric Co.
		500	WPCC	Chicago, Ill., North Shore Congregational Church.
		50	KNAL	Omaha, Nebr., Central High School.
		50	KFJX	Cedar Falls, Iowa, Iowa State Teachers College.
		50	KFUL	Galveston, Tex., Thomas Goggan & Bros. Music Co.
		25	WAAD	Cincinnati, Ohio, Ohio Mechanics Institute.
		50	KFDH	Tucson, Ariz., University of Arizona.
		250	KOCH	Omaha, Nebr., Central High School.
		50	WDBC	Lancaster Pa., Kirk, Johnson & Co.
261	1150	500	KWKH	Kennonwood, La., W. G. Patterson.
		250	WKAF	Milwaukee, Wis., WKAF Broadcasting Co.
		50	WDAY	Fargo, N. Dak., Radio Equipment Corp.
		100	WSKC	Bay City, Mich., World's Star Knitting Co.
		100	KFWA	Ogden, Utah, Browning Bros. Co.
		100	WDBR	Boston, Mass., Tremont Temple Baptist Church.
		100	WARC	Medford Mass., American Radio & Research Co.
		100	WABQ	Haverford, Pa., Haverford College Radio Club.
		50	WOAC	Lima, Ohio, Page Organ Co.
		500	WPSC	State College, Pa., Pennsylvania State College.
		250	WEAM	North Plainfield, N. J., Borough of North Plainfield.
		225	KFJF	Oklahoma City, Okla., National Radio Mfg. Co.
		100	WTAR	Norfolk, Va., Reliance Electric Co.
		15	WTAZ	Lambertville, N. J., Thomas J. McGuire.
		100	KFAJ	Boulder, Colo., University of Colorado.
		100	KFMR	Sioux City, Iowa, Morningside College.
		50	KFQA	St. Louis, Mo., The Principia.
		500	WMAZ	Macon, Ga., Mercer University.
263	1140	250	KTBR	Portland, Ore., Brown's Radio Shop.
		100	WQAM	Miami, Fla., Electrical Equipment Co.
		500	WHAT	Minneapolis, Minn., Dr. George W. Young.
		50	KFMW	Houghton, Mich., M. G. Sateron.
		250	WSDA	New York, N. Y., Seventh Day Adventist Church.
		150	KFQB	Fort Worth, Tex., Searchlight Publishing Co.
		500	WAAM	Newark, N. J., I. R. Nelson & Co.
		250	WCAD	Canton, N. Y., St. Lawrence University.
		50	WABR	Toledo, Ohio, Scott High School.
		500	WCAR	San Antonio, Tex., Southern Radio Corp of Texas.
		50	KFJR	Portland, Ore., Ashley C. Dixon & Son.
		5	WCBE	New Orleans, La., Uhalt Radio Co.
		100	WRAV	Yellow Springs, Ohio, Antioch College.
		100	WDAG	Amarillo, Tex., J. Laurence Martin.
		5	WEBZ	Savannah, Ga., Savannah Radio Corp.
266	1130	1000	WENR	Chicago, Ill., All-American Radio Corp.*
		500	WBCN	Chicago, Ill., Southown Economist.
		250	KLZ	Denver, Colo., Reynolds Radio Co.
		50	KFRY	State College, N. Mex., New Mexico College of Agriculture & Mechanic Arts.
		100	KFPY	Spokane, Wash., Symons Investment Co.
		500	KFNF	Shenandoah, Iowa, Henry Field Seed Co.
		100	KFIO	Spokane, Wash., North Central High School.
		100	WHAV	Wilmington, Del., Wilmington Electrical Specialty Company.
		500	WCAH	Columbus, Ohio, Entrekin Electric Co.
		500	WWJ	Dearborn, Mich., Ford Motor Co.
		500	WMAK	Lockport, N. Y., Norton Laboratories.
		500	WGHB	Clearwater, Fla., George H. Bowles Developments.
		100	WTAB	Fall River, Mass., Fall River Daily Herald.
268	1120	100	KFGC	Baton Rouge, La., Louisiana State University.
		50	KFRC	San Francisco, Calif., City of Paris Dry Goods Co.
		500	KFEQ	Oak, Nebr., Scroggin & Co.
		500	WTAG	Worcester, Mass., Worcester Telegram Pub. Co.
		100	WSAX	Chicago, Ill. (portable), Zenith Radio Corp.
		500	WNCX	Knoxville, Tenn., Peoples Telephone & Telegraph Co.
		250	WFBM	Indianapolis, Ind., Merchants Heat & Light Co.
		500	WEBW	Beloit, Wis., Beloit College.
		100	WDRC	New Haven, Conn., Doolittle Radio Corp.
		10	WCBG	Pascagoula, Miss., Howard S. Williams.
		50	WEAH	Wichita, Kans., Hotel Lassen.
		10	WBBY	Charleston, S. C., Washington Light Infantry.
		100	WAAB	New Orleans, La., Valdemar Jensen.
		100	WJAM	Cedar Rapids, Iowa, D. M. Perham.
		500	WRAM	Gloucester City, N. J., Walter G. Flexon.
		100	WTAC	Johnstown, Pa., Penn Traffic Co.
270	1110	750	WOI	Ames, Ia., Iowa State College.*
		1500	WGHP	Detroit Mich., George H. Phelps, Inc.*
		100	WDBE	Atlanta, Ga., Gilham-Schoen Electric Co.
		500	WJBL	Decatur, Ill., William Gushard Dry Goods Co.
		500	KFBU	Laramie, Wyo., Bishop N. S. Thomas (The Cathedral)
		100	WBAO	Decatur, Ill., James Millikin University.
		500	KGU	Honolulu, Hawaii, Marion A. Mulrony.
		10	WOWL	New Orleans, La., Owl Battery Co.
		500	KFGH	Stanford University, Calif., Leland Stanford Junior University.
		500	WGST	Atlanta, Ga., Georgia School of Technology.
		500	WTAW	College Station, Tex., Agricultural & Mechanical College of Texas.
		200	WJAG	Norfolk, Nebr., Norfolk Daily News (Huse Pub. Co.)
		100	WRK	Hamilton, O., Doron Bros. Electrical Co.
		500	WEAN	Providence, R. I., Shepard Co.
273	1100	250	WHK	Cleveland, O., Radio Service Corp.
		100	KFAD	Phoenix, Ariz., Electrical Equipment Co.
		100	WFBH	New York, N. Y., Concourse Radio Corp.
		250	WIL	St. Louis, Mo., St. Louis Star and Benson Radio Co.
		250	WSBF	St. Louis, Mo., Stix-Baer & Fuller.
		100	KFDY	Brookings, S. Dak., South Dakota State College of Agriculture & Mechanic Arts.
		50	WTG	Manhattan, Kans., Kansas State Agricultural College.
		50	KFKA	Greeley, Colo., Colorado State Teachers College.
		500	KHQ	Spokane, Wash., Louis Wasmer.
		10	WFAM	St. Cloud, Minn., Times Publishing Co.
		100	KFLZ	Anita, Iowa, Atlantic Automobile Co.
		100	KFIZ	Fondulac, Wis., Daily Commonwealth & Wisconsin Radio Sales.
		250	WBAA	West Lafayette, Ind., Purdue University.

Wave Length	Frequency (Kilocycles)	Power (Watts)	Call Letters	Location and Owner of Station
273	—1100—	500—	WRW	Tarrytown, N. Y., Tarrytown Radio Research Laboratory.
		500—	WBBR	Rossville, N. Y., Peoples Pulpit Assn.
		500—	WEBJ	New York, N. Y., Third Avenue Railway Co.
		500—	WRM	Urbana, Ill., University of Illinois.
		250—	WDAE	Tampa, Fla., Tampa Daily Times.
275	—1090—	1000—	WCEE	Elgin, Ill., E. B. Erbstein.
		500—	WHAR	Atlantic City, N. J., E. P. Cook's Sons.
		500—	WAFD	Port Huron, Mich., Albert B. Parfet Co.*
		5000—	WORD	Batavia, Ill., Peoples Pulpit Assn.*
		250—	WBT	Charlotte, N. C., Chamber of Commerce.
		250—	WSBT	South Bend, Ind., South Bend Tribune.
		100—	WKY	Oklahoma, Okla., E. C. Hull & H. S. Richards.
		500—	WHAD	Milwaukee, Wis., Marquette University and Milwaukee Journal.
		500—	WCAC	Mansfield, Conn., Connecticut Agricultural College.
		50—	WABZ	New Orleans, La., Coliseum Place Baptist Church.
		500—	KFSG	Los Angeles, Calif., Echo Park Evangelistic Assn.
		500—	WBAK	Harrisburg, Pa., Pennsylvania State Police.
		100—	WCAO	Baltimore, Md., Albert A. & A. Stanley Brager.
		20—	WLAP	Louisville, Ky., William V. Jordan.
		100—	WWL	New Orleans, La., Loyola University.
		100—	WAAC	New Orleans, La., Tulane University.
		15—	WOCL	Jamestown, N. Y., Hotel Jamestown.
		500—	WSMK	Dayton, O., S. M. K. Radio Corp.
		500—	KFKU	Lawrence, Kans., University of Kansas.
		50—	WPAK	Agricultural College N. Dak., North Dakota Agricultural College.
		500—	WJAS	Pittsburgh, Pa., Pittsburgh Radio Supply House.
		500—	KQV	Pittsburgh, Pa., Doubleday-Hill Electric Co.
		100—	WMAC	Cazenovia, N. Y., Clive B. Meredith.
		50—	KFBB	Havre, Mont., F. A. Buttrey & Co.
		100—	WEAU	Sioux City, Ia., Davidson Bros. Co.
		500—	WFAV	Lincoln, Nebr., University of Nebraska.
278	—1080—	500—	KOIL	Council Bluffs, Ia., Monarch Mfg. Co.*
		1000—	WOQ	Kansas City, Mo., Unity School of Christianity.*
		10—	WGBC	Memphis, Tenn., First Baptist Church.
		500—	WCAU	Philadelphia, Pa., Universal Broadcasting Co.
		500—	WGBU	Fulford-by-the-Sea, Fla., Florida Cities Finance Co.
		50—	KFDD	Boise, Idaho, St. Nicholas Cathedral.
		500—	KFAU	Boise, Idaho, Independent School District of Boise City.
		500—	KWWG	Brownsville, Tex., City of Brownsville.
		500—	WHDI	Minneapolis, Minn., William Hood Dunwoody Industrial Institute.
		100—	KFJM	Grand Forks, N. Dak., University of North Dakota.
		50—	WMAN	Columbus, O., W. E. Heskett (First Baptist Church).
		500—	WAAW	Omaha, Nebr., Omaha Grain Exchange.
		100—	WABO	Rochester, N. Y., Hickson Electric Co. (Lake Avenue Baptist Church).
		100—	WFBG	Altoona, Pa., William F. Gable Co.
		100—	WHAM	Rochester, N. Y., Eastman School of Music, University of Rochester.
		500—	KOP	Detroit, Mich., Detroit Police Department.
		100—	KUSD	Vermillion, S. Dak., University of South Dakota.
		100—	WDZ	Tuscola, Ill., James L. Bush.
		200—	WAAF	Chicago, Ill., Chicago Daily Drovers Journal.
		500—	WRBC	Valparaiso, Ind., Immanuel Lutheran Church.
		500—	WKAA	Cedar Rapids, Iowa, Harry S. Paar.
		500—	WLB	Minneapolis, Minn., University of Minnesota.
		500—	WLBL	Stevens Point, Wis., Wisconsin Department of Markets.

CLASS "B" STATIONS

Wave Length	Frequency (Kilocycles)	Power (Watts)	Call Letters	Location and Owner of Station
280.2—	1070—	500—	WNAC	Boston, Mass., Shepard Stores.
282.8—	1060—	1000—	WSM	Nashville, Tenn., National Life & Accident Insurance Co.
		500—	WOAN	Lawrenceburg, Tenn., James D. Vaughn.
285.5—	1050—	500—	WEMC	Berrien Springs, Mich., Emmanuel Missionary College.
		1000—	WKAR	East Lansing, Mich., Michigan State College.
		500—	WREO	Lansing, Mich., Reo Motor Car Co.
288.3—	1040—	1000—	WLW	New York, N. Y., Missionary Society of St. Paul the Apostle.
		2000—	KFKX	Hastings, Nebr., Westinghouse Electric & Mfg. Co.
293.9—	1020—	500—	WAIU	Columbus, Ohio, American Insurance Union.
		750—	KTBI	Los Angeles, Calif., Bible Institute of Los Angeles.
		500—	WEAO	Columbus, Ohio, Ohio State University.
296.9—	1010—	500—	KPRC	Houston, Tex., Houston Print Co.
299.8—	1000—	1000—	KSL	Salt Lake City, Utah, Radio Service Corp. of Utah.
		750—	KFMQ	Fayetteville, Ark., University of Arkansas.
		500—	WPG	Atlantic City, N. J., Municipality of Atlantic City.
302.8—	990—	2500—	WLIB	Elgin, Ill., Liberty Weekly.
		500—	WJJD	Mooseheart, Ill., Supreme Lodge, Loyal Order of Moose.
305.9—	980—	1000—	KTCL	Seattle, Wash., American Radio Telephone Co.
		500—	WJAR	Providence, R. I., The Outlet Co.
309.1—	970—	Variable—	KDKA	East Pittsburgh, Pa., Westinghouse Electric & Mfg. Co.
315.4—	950—	500—	WGBS	New York, N. Y., Gimbel Bros.
		1000—	KPSN	Pasadena, Calif., Pasadena, Star News.
		5000—	WAHG	Richmond Hill, N. Y., A. H. Grebe & Co.
		500—	KFDM	Beaumont, Tex., Magnolia Petroleum Co.
319	— 940—	750—	WGR	Buffalo, N. Y., Federal Telephone Mfg. Co.
		500—	WSMB	New Orleans, La., Saenger Amusement Co. and Maison Blanche Co.
322.4—	930—	1500—	WJAZ	Mt. Prospect, Ill., Zenith Radio Corp.
		5000—	KOA	Denver, Colo., General Electric Co.
325.9—	920—	5000—	WSAI	Mason, Ohio, United States Playing Card Co.
		1000—	WKRC	Cincinnati, Ohio, Kodel Radio Corp.
333.1—	900—	2000—	WBZ	Springfield, Mass., Westinghouse Electric & Mfg. Co.
336.9—	890—	500—	WCAL	Northfield, Minn., St. Olaf College.
		500—	KNX	Hollywood, Calif., Los Angeles Evening Express.
		500—	KFMX	Northfield, Minn., Carleton College.
340.7—	880—	1000—	KFAB	Lincoln, Nebr., Nebraska Buick Auto Co.
		500—	WMCA	Hoboken, N. J., Greeley Square Hotel Co.
		500—	WKAQ	San Juan, P. R., Radio Corp of Porto Rico.
		500—	KSAC	Manhattan, Kans., Kansas State Agricultural College.
344.6—	870—	5000—	WCBD	Zion, Ill., Wilbur G. Voliva.
		1500—	WLS	Crete, Ill., Sears, Roebuck & Co.
348.6—	860—	1000—	KOB	State College, N. Mex., New Mexico College of Agriculture & Mechanic Arts.
		500—	KWSC	Pullman, Wash., State College of Washington.
		500—	WTIC	Hartford, Conn., Travelers Insurance Co.
352.7—	850—	500—	WJAD	Waco, Tex., Jackson's Radio Engineering Laboratories.
		1000—	WWJ	Detroit, Mich., Detroit News.
361.2—	830—	3500—	KGO	Oakland, Calif., General Electric Co.
		500—	WHN	New York, N. Y., George Schubel.
365.6—	820—	500—	WDAF	Kansas City, Mo., Kansas City Star.
		500—	WHB	Kansas City, Mo., Sweeney School Co.
370.3—	810—	1000—	WEBH	Chicago, Ill., Edgewater Beach Hotel Co.
		100—	WGN	Chicago, Ill., Chicago Tribune.
374.8—	800—	500—	KTHS	Hot Springs, Ark., New Arlington Hotel.
		500—	KVOO	Bristow, Okla., "Voice of Oklahoma."
379.5—	790—	5000—	WGY	Schenectady, N. Y., General Electric Co.
		1000—	WHAZ	Troy, N. Y., Rensselaer Polytechnic Institute.
384.4—	780—	500—	WMBF	Miami Beach, Fla., Fleetwood Hotel Corp.
		1000—	KJR	Seattle, Wash., Northwest Radio Service Co.
389.4—	770—	1000—	WEAR	Cleveland, Ohio, Goodyear Tire & Rubber Co.
		3500—	WTAM	Cleveland, O., Willard Storage Battery Co.
394.5—	760—	2000—	WOAI	San Antonio, Tex., Southern Equipment Co.
		500—	WLIT	Philadelphia, Pa., Lit Bros.
		500—	WFI	Philadelphia, Pa., Strawbridge & Clothier.
399.8—	750—	500—	WHAS	Louisville, Ky., Courier Journal & Louisville Times.
405.3—	740—	500—	KHJ	Los Angeles, Calif., Times-Mirror Co.
		1000—	WJY	New York, N. Y., Radio Corporation of America.
		500—	WOR	Newark, N. J., L. Bamberger & Co.
416.4—	720—	5000—	WCCO	St. Paul-Minneapolis, Minn., Washburn-Crosby Co.
422.3—	710—	1000—	WKRC	Cincinnati, Ohio, Kodel Radio Corp.
		5000—	WLW	Harrison, Ohio, Crosley Mfg. Co.
428.3—	700—	1000—	WSB	Atlanta, Ga., Atlanta Journal.
		1000—	KPO	San Francisco, Calif., Hale Bros.
440.9—	680—	5000—	WOS	Jefferson City, Mo., Missouri State Marketing Bureau.
		1000—	KLDS	Independence, Mo., Reorganized Church of Jesus Christ of Latter Day Saints.
		500—	WDWF	Cranston, R. I., Dudee W. Flint, Inc.
		1000—	WMAF	Dartmouth, Mass., Round Hills Radio Corp.
447.5—	670—	500—	WQJ	Chicago, Ill., Calumet Rainbo Broadcasting Co.
		500—	WMAQ	Chicago, Ill., Chicago Daily News.
454.3—	660—	1000—	KTW	Seattle, Wash., First Presbyterian Church.
		1000—	WJZ	New York, N. Y., Radio Corporation of America.
		1000—	KFOA	Seattle, Wash., Rhodes Department Store.
461.3—	650—	500—	WCAE	Pittsburgh, Pa., Kaufmann & Baer.
468.5—	640—	500—	WCAP	Washington, D. C., Chesapeake & Potomac Telephone Co.
		1000—	WRC	Washington, D. C., Radio Corporation of America.
		3000—	KFI	Los Angeles, Calif., Earle C. Anthony, Inc.
475.9—	630—	500—	WFAA	Dallas, Tex., Dallas News & Dallas Journal.
		500—	WEEI	Boston, Mass., Edison Electric Illuminating Co. of Boston.
		1500—	WBAP	Fort Worth, Tex., Star-Telegram (Wortham Carter Publishing Co.)
483.6—	620—	5000—	WOC	Davenport, Ia., Palmer School of Chiropractic.
		500—	WSUI	Iowa City, Iowa, State University of Iowa.
491.5—	610—	5000—	WEAF	New York, N. Y., American Telephone & Telegraph Co.
		500—	KGW	Portland, Oreg., Morning Oregonian.
499.7—	600—	500—	KFRU	Columbia, Mo., Stephens College.
508.2—	590—	500—	WOO	Philadelphia, Pa., John Wanamaker.
		500—	WIP	Philadelphia, Pa., Gimbel Bros.
		500—	KLX	Oakland, Calif., Oakland Tribune.
516.9—	580—	5000—	WJR	Pontiac, Mich., Jewett Radio & Phonograph Co. and Detroit Free Press.
526	— 570—	5000—	WHO	Des Moines, Iowa, Bankers Life Co.
		1000—	WNYC	New York, N. Y., City of New York, Dept. of Plant & Structures.
		1000—	WOAW	Omaha, Nebr., Woodmen of the World.
535.4—	560—	750—	WHA	Madison, Wis., University of Wisconsin.
		2000—	KYW	Chicago, Ill., Westinghouse Electric & Mfg. Co.
545.1—	550—	500—	KFUO	St. Louis, Mo., Concordia Seminary.
		750—	KSD	St. Louis, Mo., Post Dispatch (Pulitzer Printing Co.)

*Class "B" station working on a class "A" wavelength.



A RESCUE ship, heading for its unseen objective, is guided by a radio compass. (Wide World).

RADIO WORLD'S

Laboratory

Reports for the Guidance of Its Readers

Address problems to Laboratory Director, RADIO WORLD, 145 West 45th Street, New York City.

Coil Coupling on the Radio Side—Why Tight Coupling Never Results in Maximum Signal Response—Coil Design, and the Relative Position, Are Determining Factors.

EXCLUSIVE of the vacuum tube, coupling is the most important item in the entire radio category, since upon its action is dependent the operation of the receiver. Eliminate all coupling and the signal energy gets no further than the receiving aerial, for without coupling it cannot pass to the secondary circuit, through the tube into the next tube and so on. Despite being a paramount item, coupling has been considered mostly from one angle, this being its association with radio-frequency circuits. The phenomena relative to the transfer of energy from the aerial circuit to the secondary circuit and the result of this action upon the selectivity obtainable with the receiver have been neglected.

But with the general increase in power of the many broadcasting stations in operation, and the construction limitations imposed upon receivers, the problem of the much desired selectivity has aroused interest in that forgotten item, coupling, since through its action selectivity can be greatly increased.

Coupling, as the word is defined, means linking or joining together. Therefore when we couple two circuits we link or join them together. As to the methods used, we have several. Some are solid, visible items; others exist only in theory. The tangible are transformers, resistances, chokes, condensers, etc., whereas the theoretical are magnetic lines of force and electro-static lines of force.

Glance at Fig. 2. Here we have two circuits. A is the aerial circuit and B is the secondary circuit. The signal from the transmitting station is impinged across the aerial-ground system at A; current flows through coil A, causing a magnetic field to surround coil A. This is shown as the dotted lines emanating from A. Now these magnetic lines of force increase and decrease in intensity according to the fluctuations of the current flowing in the circuit. Further, when magnetic lines of force emanating from a certain source cut the turns of another coil at right angles to the plane of the turns, there is induced in the turns of the second coil an emf equal in time fluctuation to that flowing in the original coil. This is called inductive coupling, since the energy is induced in the second coil, and there is no direct connection other than via the magnetic field.

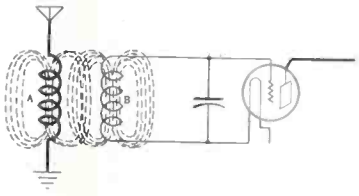


FIG. 2

The number of lines of force which enter or cut the turns of coil B governs the degree of coupling between coils A and B. Normally this is understood to be the separation between the coils; that is, the closer the two coils the closer the coupling between them. Now, it must not be overlooked that when the lines of force of coil A cut the turns of coil B and induce current in that coil, there is also created from coil B a certain magnetic field, since current is flowing in that coil, and wherever current is caused to flow there are created magnetic lines of force.

It is this fact which governs the comprehension of the various degrees of coupling, that is, loose, critical and close. In other words, loose coupling means a certain position of the coils whereby little current is induced in coil B, due to the great separation between the coils so that the lines of force cutting the turns of coil B are weak and few in number. Also when the coils are so placed that the lines of force of A cut the turns of B parallel to the plane of the coil, no current is induced.

Critical coupling exists when the maximum amount of current is being induced in coil B by the lines of force of coil A. This does not signify that the coils must be close together. The reason for this follows: If the two coils are close together so that the magnetic field of coil B (induced as explained) is permitted to react upon coil A, it will induce in coil A a counter force which will cut down the strength of the field of A with the result that the transfer of energy between A and B will be reduced by virtue of the reduced field of coil A. When this condition exists it is known as close coupling, and close coupling is never conducive to maximum energy transfer. Interpreted into regular radio vernacular for the radio fan, close coupling will never afford the maximum signal intensity.

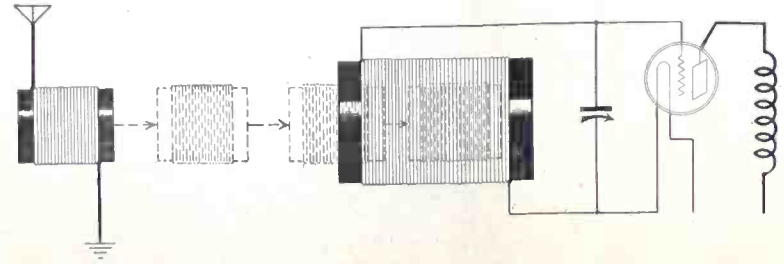


FIG. 1

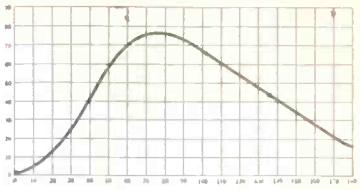
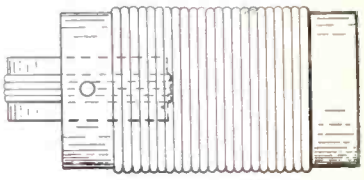


FIG. 3



Primary wound in slot

FIG. 4

This is illustrated in Fig. 3, the curve showing the transfer of energy between two circuit. One circuit is the aerial-ground system, the other the secondary circuit feeding into the grid of the first tube. The coupling medium is the 180-degree variocoupler (Fig. 4). The extreme left vertical line shows the relative values of response; the bottom horizontal line, the various values of coupling between the primary and the secondary of the vario-coupler. The relative values of response can be interpreted as various degrees of signal intensity passed in the secondary circuit when a finite signal is coursing through the primary circuit.

It is obvious from the curve that the coupling between the two circuits manifests a decided effect upon the signal in the secondary circuit. Further, a study will show that the maximum coupling is not the correct point for maximum signal intensity; also that the critical point of coupling, that is when the maximum signal is induced in the secondary circuit, is not even half coupling. However, this has no special significance, since the point of critical coupling depends upon the coils used, the signal intensity of the signal in the primary and the frequency of the signal. It is imperative that the difference between close and critical coupling be understood, if the advantages accruing from the use of variable coupling is to be realized.

Referring to Fig. 1, we have a coil connected into the aerial-ground circuit. Another coil, the secondary, is connected to the grid-filament circuit of the tube. The phantom coils indicate various positions of the coil in the aerial circuit, at various degrees of coupling. Reading from left to right, the coil in its original position and shifted to the right would constitute various degrees of loose coupling, for example points 30 and 50 respectively on the curve of Fig. 3.

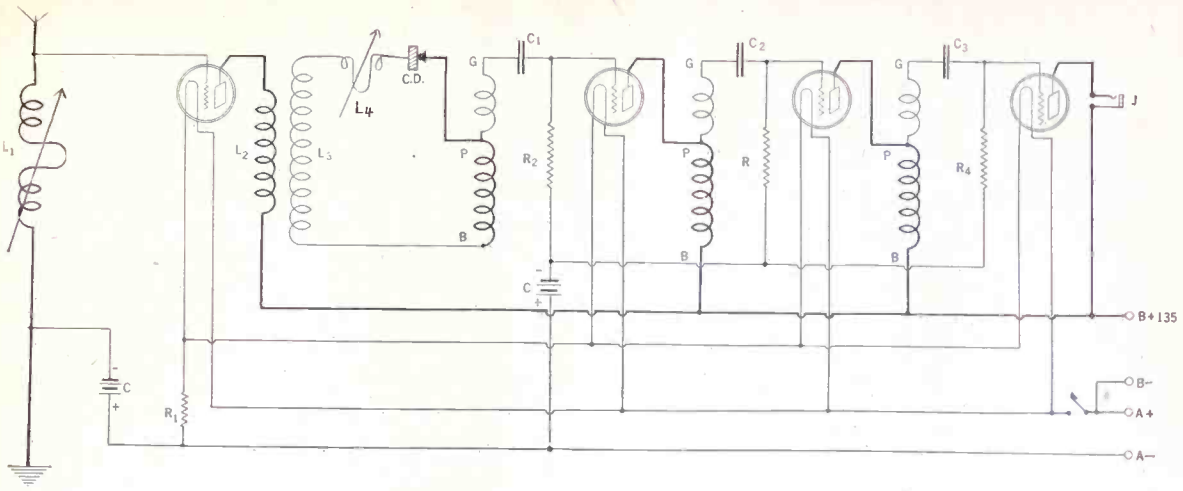


FIG. 255 showing the electrical diagram of the receiver Mr. Greenstein requested.

Radio University

A QUESTION and Answer Department conducted by RADIO WORLD for its Readers by its staff of Experts. Address Radio University, RADIO WORLD, 145 West 45th St., N. Y. C.

I WOULD like to have a diagram of a 4-Tube receiver, in which a crystal is used as a detector, a tube is used as a non-regenerative RF amplifier and 3 tubes are used as AF amplifiers, where auto-transformers are used as a means of coupling. It is also requested that a C battery be inserted in series with the antenna coil to the grid post of the RF tube. Please give all the constants of the coils, condensers, etc.—Sidney Greenstein, 828 Dawson St., N. Y. City.

Fig. 255 shows the diagram that you request. L1 is a variometer of the large type. L2, L3 is a standard RFT. The primary, L1, is wound on a tubing 3¼" in diameter and consists of 10 turns. The secondary is wound on the same tubing, with a ⅜" spacing. It consists of 45 turns. Use No. 24 silk over cotton covered wire, L4 is a variometer of smaller size. If you wish to construct the large variometer, L1, here is the dope: Procure a form 3" in diameter and 4" in length. Wind 20 turns on one side or on 2" of the form. Leave a ¼" space and 20 more turns. This constitutes the stator, wherein 40 turns are wound as you see. The space is left for the drilling of a hole to insert the shaft. The rotor is wound 2" in diameter and 2" high. Wind 36 turns. Leave ¼" space. Wind 30 more turns. The ending of the stationary winding goes to the beginning of the rotary winding, which leaves you two leads. Use No. 24 silk over cotton covered wire. This variometer is to be inserted in series with the antenna and is known as L1. The smaller variometer L4 is made in similar fashion, except that the stationary form has 20 turns, while the rotary form has 40 turns. Use the same size forms with the same size wire. C1, C2 and C3 are all .25 mfd. or 1 mfd. fixed condensers. The 1 mfd. condensers will prevent choking and is dependent upon the tubes. R, R2 and R4 are all 500,000 ohm resistances. R1 is a 1 ampere ballast resistor. The C battery in the RF stage should have a voltage of 4½. The C battery voltage for the amplifier tubes is dependent upon the voltage employed on the plates of these tubes, viz., with the 201A type tube, 90 volts on plate, a 4.5 volt C battery is required; with 135 volts on the plate of the same tube a bias of 9 volts is necessary.

* * *

WITH REFERENCE to the 8-tube Super-Heterodyne, published in the July 4 and 11 issues of RADIO WORLD, could I use an Acme R3 in this set? (2) Could an Acme R3 be used in any Super-Heterodyne?—H. C. Van Cleve, 651 West 188th St., N. Y. City.

(1) No. (2) This type of transformer can only be used in a set where the broadcast band is to be covered (200 to 550 meters) and not where the extremely high wavelengths such as employed in all Super-Heterodyne intermediate frequency amplifiers, are to be amplified. They can be used before the first detector in a super-heterodyne for RF amplifying, but not in the receiver proper.

* * *

I WOULD like to build the Thordarson-Wade receiver described in the Oct. 3, 10 and 17 issues of RADIO WORLD, by Herman Bernard. However, I do not know where to get the special parts that are mentioned. There is no radio store around here that carries them.—Joseph Jackson, 2701 Eighth St., Port Arthur, Tex.

Write to the Enter City Radio Company, 222 Fulton St., N. Y. City.

* * *

AS TO the 2-Tube Reflex receiver that appeared in the Dec. 19 issue of RADIO WORLD on page 9. (1) I have one Erla 6 to 1 AFT and one Erla 3½ to 1 AFT. Are these O.K.? (2) How many turns should be placed on forms to constitute the RFT and the 3-circuit tuner? (3) Will this set work on a loop?—J. E. Charlton, Richmond, Ind.

(1) Yes. (2) The primaries, L1 and L3, consist of 10 turns. The secondaries, L2 and L5, consist of 45 turns. The tickler, L4, consists of 35 turns. Each primary and the secondary is wound on tubing 3¼" in diameter. There is a ¼" separation between the windings. The tickler is wound on a tubing 2½" in diameter. Use No. 22 double cotton covered wire. (3) No.

* * *

I DESIRE to build the 1-Tube receiver described in the January 2 issue of RADIO WORLD on page 13. This receiver employs the method whereby wavelengths at both the high and low frequencies can be obtained, without changing any coils. I built the 3-circuit tuner receiver as described in the October 10 issue of RADIO WORLD. Now I find that stations below 400 meters come in very well, but stations above 400 meters can hardly be heard. How can I tap the secondary so that I can receive stations as low as 100 meters and as high as 600 meters without any trouble?—Charles Turner, 118 High St., Elyria, O.

Add 8 turns to the secondary. Tap the coil at 20th turn from the beginning.

* * *

I LIVE ½ mile from WAHG, Richmond Hill, N. Y., and find it very difficult with a 3-tube receiver employing a 3-circuit tuner to tune them out. Now I would like to know if there is any receiver manufactured employing 3 tubes, that when installed in my home will tune this station out. (2) Which is the better form of AF amplification; two stages of transformer coupled or 3 stages of autoformer coupling?—John Walsh, 4536 11th St., Richmond Hill, N. Y.

(1) The receiver you have ought to tune this station out. This is the best receiver tube for tube that you can build. There is no manufactured set that employs 3-tubes, unless it uses the 3-circuit method that will equal the results you get with this set. Be sure that your antenna is at right angles to the WAHG antenna. Be sure that there are no leaks due to poor soldering joints present. Use a short antenna. If the station still persists in coming in, build a wavetrap, such as described by J. F. Rider in the Dec. 26 issue of RADIO WORLD. (2) The transformer method of coupling will give you more volume tube for tube. However, for the method you suggest, the autoformers are the better bet.

* * *

I WOULD like to know if the 3-Tube Dry Cell Circuit described by Capt. Peter V. O'Rourke will work satisfactorily with the Karas SLF .0005 mfd. variable condensers? If it will, the coil data would be appreciated.—H. M. Horton 36 Division St., Providence, R. I.

Yes. The primary L1 consists of 10 turns of No. 24 silk over cotton covered wire wound on a 3½" outside diameter skeleton form, 4 or 4½" high. A space of ⅜" is left. The secondary is then wound, which consists of 52 turns. The secondary is tapped at the 11th turn and then at the 28th turn.

* * *

HOW MANY turns of No. 22 double cotton covered wire should be wound to constitute the radio-frequency transformer in the Bernard 1-Tube DX Set, described in the Oct. 24 issue of RADIO WORLD, so that a .0005 mfd. variable condenser can be shunted across the secondary instead of the .00035 mfd. variable condenser specified? These windings are to be made on a tubing 3½" in diameter. (2)—Where shall the tap be placed? A .00025 mfd. variable condenser shall be used. (3)—In regard to the RX1 receiver described in the Oct.

14 issue of RADIO WORLD, I would like to know how many turns should be placed on a form 2¾" in diameter to constitute both the antenna coil and the RFT, the secondaries of both being shunted by .0005 mfd. variable condensers.—T. Damn, P. O. Box 97, Rolla, Mo.

(1)—There will be 10 turns to constitute the primary and 45 turns wound to constitute the secondary. There is a ¼" space left between the two windings. (2)—The tap is made at the 8th turn from the beginning of the coil. (3)—The antenna coil has 53 turns of No. 22 double silk covered wire. The aerial tap is taken at the 10th turn. The secondary of the RF coil has 65 turns of No. 22 double silk covered wire. The primary consists of 15 turns of No. 40 double silk covered wire, which is placed on the inside of the secondary winding.

* * *

IN THE December 26 issue of RADIO WORLD, there appeared an article by John F. Rider, describing the Regenerative Wave Trap. I have a Browning-Drake 4-Tube receiver and owing to my close location to KGO, in Oakland, Cal., I find it very difficult to cut this station out. Now I would like to know if this trap could be successfully employed with this receiver. If so would any change in the number of batteries have to be made? That is, I have one 6-volt A battery and two 45-volt B batteries. Now could I use the same A battery, but with a separate B battery for the tube in the trap circuit and obtain the maximum results? How can I insert the trap in the circuit?—R. N. Critchlow, 82nd Ave. and Forthill Blvd., Oakland, Cal.

This trap will work very good in connection with this set. You will have to use a separate B battery. A common A battery is O. K. As to the inserting of the trap in the receiver, the primary of a 3-circuit tuner or the rotor of the variometer is placed in series with the antenna. The rest of the circuit remains the same.

* * *

I HAVE built the 1925 Model Diamond of the Air and am getting very good results. (1)—Is the Thordarson-Wade a better receiver? (2)—Would the quality of the signals be improved if the autotransformers were employed in the audio-frequency amplification portion of the set? (3)—I have quite a great deal of trouble in controlling oscillations on the lower wave lengths. How can I remedy this? (4)—Is the set employing the tickler feedback method easier to control than the one employing capacity feedback?—L. Lehaney, 728 Noble St., Toledo, O.

(1)—The results obtainable on both these receivers are on par. (2)—Yes. When using autotransformers it is advisable to have three stages. (3)—Use SLF condensers or place SLF dials on your condenser so that you can spread out the stations on the lower portion of the dial. (4)—The tickler feedback method is more stable.

* * *

I AM contemplating building the 1926 Model Diamond of the Air and would like to get the method of connecting the coil correct. (1)—Does the beginning of the primary winding go to the antenna and the ending of this winding go to the ground post? (2)—Does the beginning of the secondary winding, when adjacent to the end of the primary winding go to the A- post and the end of this winding go to the G post or to the grid condenser and leak terminals?—George M. Binger, c/o William H. Block, Indianapolis, Ind.

(1)—Yes. (2)—Yes.

* * *

I AM building a 4-Tube set this winter in which 1—stage of tuned radio-frequency amplification, a regenerative detector and 2—stages of audio-frequency amplification (transformer coupled), with 99 tubes are to be used. (1)—Would it be practical to wind the tickler coil on the same tubing with the tuning coil and connect it in series with an 11 plate condenser to control the regeneration? (2)—If it would work, would it compare with the tickler coil method of obtaining regeneration? (3)—Would a power tube work satisfactorily in the second stage of audio-frequency amplification?—James A. Yungelas, R1, Webster City, Ia.

(1)—Yes, the results obtainable therefrom would be very fine. (2)—The signal strength from the receiver using the tickler would be a bit louder. (3)—Yes.

* * *

WHAT ARE the constants for making a 3-circuit tuner which will cover from 150 to 700 meters. The form that this coil is to be wound upon is 3¼" in diameter and 4" high. The diameter of the rotor whereon the tickler coil is to be wound is 2½".—Abraham Friedman, 1042 S. 4th St., Philadelphia, Pa.

The primary consists of 10 turns. The secondaries consists of 50 turns. With this number of turns on the secondary you will be able to receive stations as high as 600 meters only. To receive stations as high as 700 meters, you will have to place a .0005 mfd. fixed condenser in parallel to the condenser which shunts the secondary of the tuner. The tickler consists of 36 turns. When winding the primary and the secondary use No. 24 silk over cotton covered wire. When winding the tickler use No. 26 double silk covered wire. If the tube does not oscillate when the receiver is tuned up to 600 meters, add 5 turns to the tickler coil.

* * *

WILL THE Ambassador coils work all right in the 4-Tube Diamond of the Air? The -01A tubes are to be used. (2)—Can I use a 20 ohm rheostat ¼" ampere to control the filament of the detector tube? (3)—Can I use a 6 ohm rheostat to control the filaments of the AF and the RF amplifier tubes? (4)—Is it necessary to use a C battery, when using a B battery Eliminator?—William H. Fowler, 360 W. 51st St., New York City.

(1)—Yes. (2)—Yes. (3)—Yes, provided this rheostat will pass ¾ of an ampere. (4)—Yes.

* * *

IS IT possible to obtain information regarding the winding of coils of a 5-Tube Neutrodyne, the secondaries of which are to be shunted by .0005 mfd. variable condensers? The forms upon which the winding is to take place is 3" in diameter (outside). (2)—I would also like to know at what point in the secondary winding to make the tap for neutralizing condenser.—Fred Zittlow, 407 Hull Court, Waubregan, Ill.

Yes. The primaries consist of 10 turns. The secondaries consist of 48 turns. Use No. 24 silk over cotton covered wire. The secondaries of the second and the third RFT are tapped at the 10th turn from the beginning of the winding. That is, when connecting this coil, the tap should be located at the 10th turn from the filament end. See the June 13 issue of RADIO WORLD for complete instructions on building a Neutrodyne.

* * *

IN REFERENCE to the 2-Tube Reflex receiver described by Brewster Lee in Aug. 15 issue of RADIO WORLD. (1)—I would like to know if a tube detector can be used instead of a crystal. If it can, how should I connect the same? (2)—Will a Carborundum fixed crystal detector give good results?—John Kaiser, Jr., Essex Mt., San Verona, N. J.

(1)—Yes. To connect the tube in this circuit, the following wiring directions have to be followed: Take the crystal out of the set. Bring the beginning of the secondary winding, L5, of the RFT, which goes to the stationary plates of the variable condensers, C2, to one terminal of a .00025 mfd. grid condenser and 2 megohm grid leak. Run the other terminal of this combination to the G post on the socket. Place a ¼ ampere ballast resistor in series with the negative leg of the filament. Connect the F+ to the A+ terminal. Connect the P post of the AFT1 to the P post of the socket. Connect the B post to the B+ post. This means that the connection from the stationary plates of the variable condenser, which went to the B+ post is disconnected. This connection goes to the A- lead. The output connections remain the same. (2)—Yes.

* * *

IN REGARD to the 4-Tube Diamond of the Air receiver described in the Jan. 23 issue of RADIO WORLD. I have a 3-circuit tuner. The diameter of the stator is 3⅛"; while that of the rotor is 2⅛". I also have a form, which is 3⅛" in diameter. On this form I wish to wind the turns to constitute the RFT. Variable condensers having a maximum capacity of .0005 mfd. are to shunt the secondaries. Please mention the number of turns to place on these forms and the spacing between the primary and the secondary windings to be made.—Frank Nussbaum, 4 LeVinnes Place, New Rochelle, N. Y.

The primaries consist of 10 turns. The secondaries consist of 43 turns. The tickler consists of 30 turns. Leave a ⅜" space between the primary and the secondary windings.

* * *

WAS THERE any Super-Heterodyne described in RADIO WORLD recently, that was a great distance getter?—G. S. Elliott, 48 South State St., Concord, N. H.

The Pressley described in the Dec. 12, 19 and 26 issue of RADIO WORLD by Herbert Hayden is a good set for getting great distance. The Fenway, described in this issue is also a good set for obtaining great distance.

* * *

WHERE CAN I obtain a certified list of parts necessary for making the 1926 Model Diamond of the Air?—Joseph Mahler, 30 Irving St., Queensboro Hill, Flushing, L. I., N. Y.

See the advertising columns of this issue.

* * *

IS THE 4-Tube DX Set described in the March 21 issue better than the RX1 receiver described in the Oct. 17 issue of RADIO WORLD or the 4-Tube Symphony set described in the Jan. 9 issue of RADIO WORLD, as to quality? (2)—Would the amplifier unit of the RX1 work well in either the Symphony or in the DX set? (3)—Which of these sets would give greatest satisfaction? (4)—Would the use of the 199 tubes require any change in the wiring of any of these circuits?—Edward Bartels, 476 West 165 St., New York City.

(1)—The RX1 and the Symphony are on par as to the quality of reception obtained, which in both cases is very good. (2)—Yes. (3)—It depends on personal taste. (4)—No. The 5-volt tubes are preferable.

* * *

WILL THE parts used in the BCL Diamond of the Air Kit give good service when set is completed?—A. L. Hogan, 521 North 13th St., Albuquerque, N. M.

Yes.

* * *

I INTEND building the 4-Tube DX Symphony set described in the Jan. 9 issue of RADIO WORLD, but before doing so I would like to have the following queries answered. (1)—May .000375 mfd. variable condensers be used instead of the .0005 mfd. variable condensers specified? (2)—If they can, I would like to have the constants of the coils, when used in conjunction with these type of condensers. I wish to use 3" forms and No. 22 double cotton covered wire.—Paul Johnson, Los Angeles, Cal.

(1)—Yes. (2)—There are 8 turns

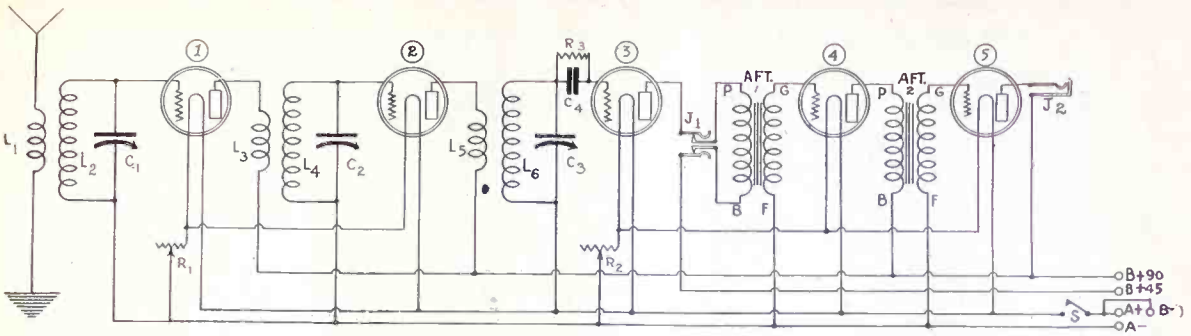


FIG. 256 showing the 5-tube TRF receiver.

wound to constitute the primaries and 65 turns wound to constitute the secondaries. There is a ¼" space left between windings. The tap is made at the 10th turn, on secondary of the second RFT.

* * *

I WOULD like to build a simple 5-tube receiver, in which 2 stages of tuned radio-frequency amplification, a non-regenerative detector and two stages of transformer coupled AF amplification are employed.—M. Krellenstein, 1022 Faile St., N. Y. City.

Fig. 256 shows such a diagram. The primaries, L1, L3 and L5 consist of 10 turns. The secondaries, L2, L4 and L6 consist of 45 turns. A form 3¼" in diameter and 4" high is used. Between the primary and secondary windings, leave ¼" space. The condensers, C1, C2 and C3 are all of the .0005 mfd. variable type. C4 is a .00025 mfd. grid condenser. The grid leak, R3 is of the 2 megohm type. R1 is a ½ ampere, 6 ohm rheostat. R2 is a 6 ohm, ¾ ampere rheostat. Both the AFT are of the low ratio variety. The —01A tubes are used throughout. A 6-volt storage battery is used to light the filaments of all the tubes. J1 is a double circuit jack, J2 is a single circuit jack.

* * *

ON PAGE 12 of the Dec. 26 issue of RADIO WORLD, at the top of the page, is an electrical circuit diagram of a 3-Tube Regenerative Reflex Neutrodyne. However there are no data given as to the constants on the coils, condensers, etc. (1)—How many turns should be placed on the primaries and the secondaries to constitute the RFT and the tuner. Also how many turns should be wound to constitute the tickler. State the diameter and height of the forms and kind of wire used. (2)—What are the ratio of the audio-frequency transformers? (3)—What is the capacity of the neutralizing condensers? (4)—The neutralizing condenser, in this diagram is brought from the grid post of the first tube to the end of the secondary winding. Should not this secondary be tapped as in the standard Neutrodyne or the Browning-Drake? (5)—Please state the capacities of the condensers, type of tubes employed, etc. (6)—When this set is properly neutralized, etc., should any distortion prevail?—C. Plawon, Chico, Cal.

(1)—The primary, which is unmarked, but which is L1 is wound on a tubing 3 1-4" in diameter and 4" high. It consists of 10 turns. The secondary L2, is wound on the same tubing, with a 1-4" separation. It consists of 45 turns. The primary L3, is wound on a tubing 3 1-4" in diameter and consists of 10 turns. The secondary, L4, is also wound on the same tubing, with a ¼" separation. It consists of 45 turns. The tickler, L5, is wound on a tubing 2¼" in diameter and consists of 36 turns. When winding the primaries and the secondaries, No. 22 double cotton covered wire should be used. When winding the tickler, No. 26 silk over cotton covered wire should be used. (2)—The audio-frequency transformer in the reflexed stage is of the high ratio type, about 6 to 1, while the ratio of the audio-frequency transformer in the AF amplifying stage is of the 3 to 1 ratio type. (3)—N, the neutralizing condenser, has a maximum capacity of .00004 mfd. (4)—Yes, it would be advisable to tap the grid coil. This tap is made at the 10th turn from the filament end of the winding. (5)—C1 and C2 are both .0005 mfd. variable condensers. C3 is a .001 mfd. fixed condenser. C4 is a .00025 mfd. variable condenser. R4 is a 2 megohm grid leak. R1 and R2 are 6-ohm rheostats. R3 is a ¼ ampere ballast resistor. The -01A tubes should be used if the latter type of rheostats and resistor are to be employed. The C battery used for the RF tube has a voltage of 4½. The voltage of the second C battery (that one used in the AF stage) is also 4½, providing the voltage on the plate of the tube is no more than 90. If you place 135 volts on the plate of this tube, then the grid bias should be 9 volts. (6)—No.

* * *

IS THE following suggestion of any value as to an aid in the reception of distant signals? I have a 4-Tube receiver, in which a regular stage of tuned radio-frequency amplification, (transformer with separate primary and secondary windings), a detector where capacity coupling to obtain regeneration and two stages of transformer coupled AF amplification are employed. Now I would like to make the RF transformer winding so that it is only one winding. The antenna connection should be made to a tap on this winding. In series with the antenna, a .0001 mfd. fixed condenser is to be placed. I also wish to change the capacity coupling to inductive feedback method coupling, using the tickler stunt.—James Conneway, L. I. City, N. Y.

This is a good idea and will aid materially in the volume of distance signals. You will however, have to add 2 turns to the secondaries of your coils, as with this condenser in series the band of wavelengths that this set will cover, will be decreased a bit. With the capacity method of coupling, the regeneration is a bit more violent and therefore the signals obtainable are a bit louder. The set employing this style of coupling is more difficult to control than the one employing the tickler method of inductively coupling the grid and plate to obtain local oscillations from the tube.

* * *

I HAVE built the 4-Tube TRF receiver described by Byrt Caldwell in the Oct. 4, 1924, issue of RADIO WORLD, but am having considerable trouble with the same. (1)—I cannot get stations below 273 meters. (2)—I cannot separate one station from the other. I have placed as low as 6 turns on the primaries. (3)—I cannot get any distance at all.—W. J. Fogel, 21 Liberty St., Passaic, N. J.

(1)—Take 5 turns off the secondaries, L2 and L4, of the tuned radio-frequency transformers. (2)—Decrease the length of your antenna. Try placing as low as 4 turns on the primaries. See that all the connections are soldered securely. See that you have the polarities of the coils right. (3)—Place a .001 mfd. fixed condenser from the plate of the detector tube to the A+ post on the same socket. Increase the B battery voltage for the detector tube. Place a 20-ohm rheostat in series with the negative leg of the filament of the RF tube. Place a variable grid leak in place of the fixed grid leak. Try placing the coils (TRFT) nearer to each other.

* * *

I HAVE built the 1926 Model Diamond of the Air and find that I can turn tickler coil around the entire 360° without getting the tube to oscillate. I wound my coils thus: On a 2½" diameter tubing, 3" long, using No. 22 SCC wire, I wound the primary which consisted of 9 turns. The secondary, consisting of 59 turns, was wound on the same tubing with no spacing. The tickler was wound on a tubing 1¼" in diameter and 1⅛" in length. There were 18 turns placed here, using No. 26 SCC wire.—W. E. Fisher, 47 Waburn Ave., Providence, R. I.

Increase the number of turns on the tickler to 36.

All America Gets Excited Over European Tests, But Luck Is Low

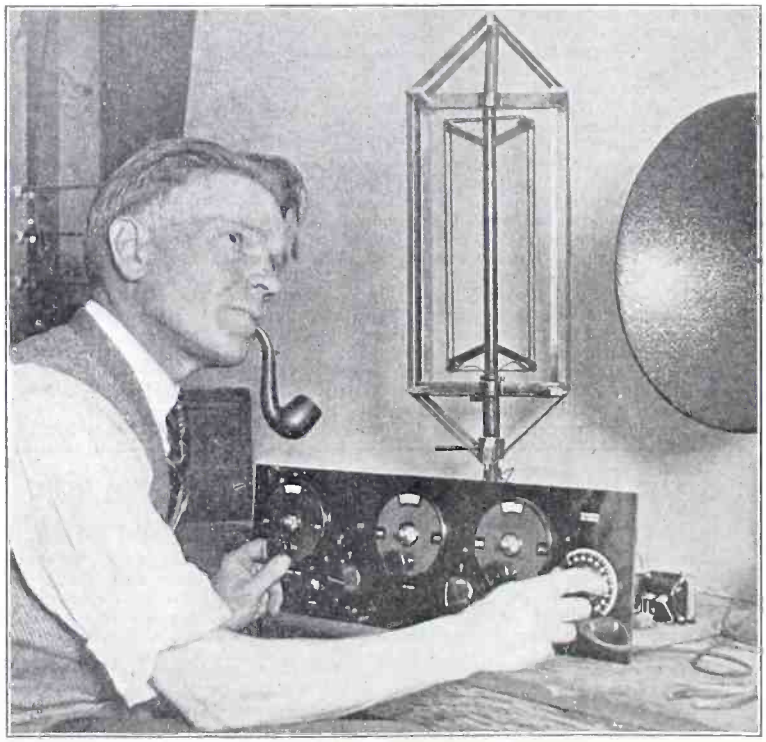
MANY made special preparations for the best possible reception apparatus, to clear the way for signals from Great Britain and the continent during the special Broadcasting the first four days of International Week. On Long Island, Arthur H. Lynch (on ladder) helped put up a long aerial at night. A little directing by his wife (at left) simplified matters for Mr. Lynch. (Foto Topics.)

AT the receiving end by the light of an oil lamp some tall hunting for foreign stations was done by Theodore Nelson (left), WMCA announcer, and Harold Stein, famous as "the radio photographer." (Foto Topics.)

How to Make Solder Cool

WHEN soldering to a transformer post (which itself is soldered to a primary or secondary lead) quickly cool the joint with water. A brush serves the purpose. Thus you do not melt the soldered winding terminal off the post. (Hayden).

Tests Tax Tuning Talent of Thousands

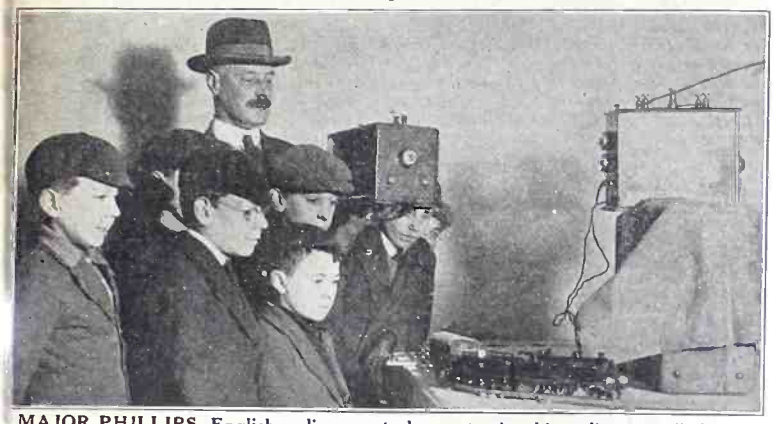


ALL EARS aptly describes America's attitude during the tests. Careful tuning was the rule. Once in a while one caught a sound that suggested 2LO, but the situation lacked definiteness. Little reception of overseas stations was reported. Photo shows W. W. Martin, of Los Angeles, hoping to catch Great Britain either east or westbound. (Kadel & Herbert.)

Enter the Slot

THE AUTOMATIC radio slot machine, delphia, made its debut in Philadelphia. T for sixteen months. The set of five tubes or batteries. A red light shows one minut being tried in a barber shop. Left to right a coin in the machine; Carmella Fratto (Wide

Radio Control of Toy Train Demonstrated

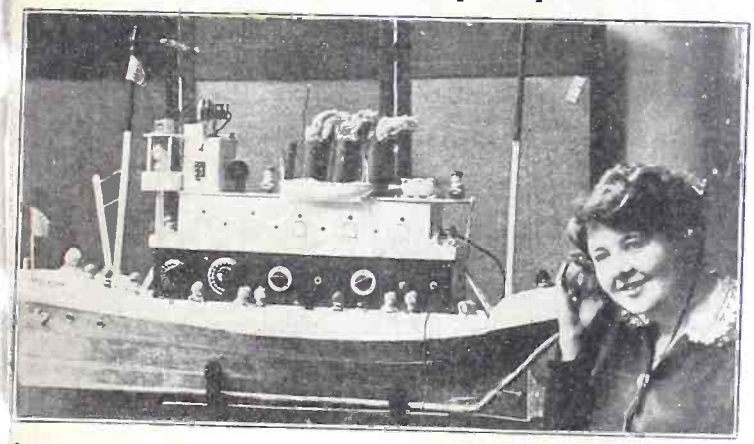


MAJOR PHILLIPS, English radio expert, demonstrating his radio-controlled train to a group of schoolboys. The box held in his hand controls the miniature train, which can be operated from a distance of 500 yards. (Kadel & Herbert.)

Expects Radio Movies

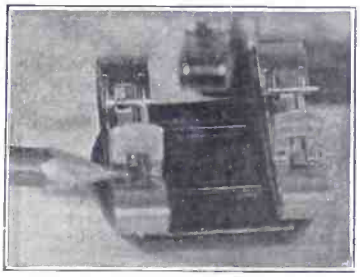
PROF. EDWARD L. BOWLES, of the Massachusetts Institute of Technology, shown with a new 20-kilowatt power tube for high power radio communication, declares that the radio reception of regulation movies is a prospect of the future and that research work along this line is being done. (Wide World)

Builds a Set in Ship Shape



"THE GOOD SHIP RADIO ROVER" designed and built by Charles E. Inman of Roxbury, Mass. Miss Eunice O'Donnell of Roxbury is shown demonstrating the set. (World Wide)

Aids Condenser Tests

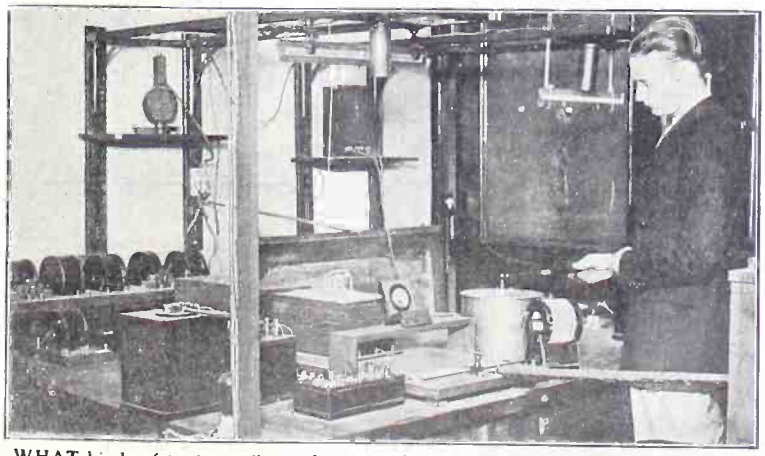


FOR experimental work two double clips may be attached to a fixed condenser, facilitating quick connections or changes in wiring.

ine Receiver!

ention of Joseph Pinto of Philaator has worked on this apparatus operated on either house current e your nickel's worth is up. It is ventor, Margaret Ruzzi, dropping chair, and Nick Ramano, barber.

Standards Bureau Tests Coils



WHAT kinds of tuning coils are best suited for radio receiving sets? What shapes are most efficient? What kinds of wire are best adapted for winding coils? These and many other questions are either answered or discussed in results of extensive experiments conducted by the Radio Laboratory of the United States Bureau of Standards in Washington. The apparatus used in the measurements is being operated by H. B. De Groot, of the Radio Laboratory, shown in the photograph. Mr. De Groot was co-author of the coil report, which was given in extensive form in the January 16 and 30 issues of RADIO WORLD. (Harris & Ewing—Wide World)

Easily Separates Stations Only Three Meters Apart

Diamond Editor:

A little over a week ago I completed my 1925 Diamond of the Air. Since that time I have the pleasure of tuning in over 45 different stations. The most distant of these were, WSAI, Cincinnati; WBAP, Fort Worth; KOIL, Council Bluffs; KMA, Shenandoah, Iowa, and KFKX, Hastings, Neb. All of the above stations were received on the loud speaker and all had volume enough to be heard quite clearly. Considering that I have only had my set a week and that I might expect quite a bit of interference from stations on the Pacific Coast I consider this a real good beginning.

The set tunes very fine. On one occasion I tuned in station KFBU, 270 meters, while KHQ, 273 meters, was on the air, and both came in with equal volume. I have done it in other cases under the same conditions. The tone of the set deserves the most credit. I can get the highest and lowest of notes without distortion. Last but not least my set is easily logged and very dependable.

I am a very consistent reader of RADIO WORLD and wish to thank you for the hookup. I wish the Diamond the best of success.

THEO. R. MORRELL,
216 Washington St.,
Reno, Nev.

* * *

Despite Adversities the Set Works Great

Diamond Editor:

I have built the 1926 Diamond of the Air and find it great. In one week's use I have logged the following stations: KMA, WCAP, KDKA, WCCO, WLW, WBAP, WOAI, WOAN, WBZ, KOA, WBBM, WOK, WSBC, WHO, WOC, WLIB, WGES, WSB, WHAS, WHT, WGN, WBZ, WGY, WOO, WCAE, WTAM, WSMB, WMC, etc. I have heard these stations under adverse conditions.

LEON J. GLINSKI,
5394 Bewick Ave.,
Detroit, Mich.

* * *

Covers Wide Range on Set, Using a Loop

DIAMOND EDITOR:

The 1926 Model Diamond of the Air, that I own, has a reputation for doing more, tube for tube, than any other set in this vicinity, and there are many here.

Using a loop, most everything from Omaha to Miami and New York to Denver has been brought in during warm and wet weather with enough volume to fill a ten-room house.

Herman Bernard has introduced me to a real circuit and it is greatly appreciated.

COLE OGLETREE.
Stuttgart, Ark.

* * *

Uses 199 Tubes, Yet Volume Satisfies Him

DIAMOND EDITOR:

I am now using the Diamond with 199 tubes. The control of regeneration is very smooth. All the volume that can be expected from dry cell tubes is obtained. Distant stations such as KDKA, WJZ, WBAP and WCAP come in on the loud speaker with plenty of volume. KFI and other stations of similar distance come in regularly on the phones.

C. B. BROWN.
921 34th St., Milwaukee, Wis.

Nameplate Stock Depleted

When the 1926 Model Diamond of the Air first presented to the public as an efficient 5-tube set for home constructors, 5,000 nameplates were made, and these were offered free to all who wanted to put one on the front panel of their Diamond. This supply is wholly exhausted and it will be a few weeks before the next order—this one for 10,000—can be filled. Meanwhile fans may send in their requests to Diamond Editor, RADIO WORLD, 145 West 45th Street, New York City, as the new name plates will be sent out in the order that requests are received. Here are some more names of fans who received nameplates:

E. Higgins, 130 Washington Ave., Elizabeth, N. J.
P. Curran, Suite 45, Strathmore Apts., Winnipeg, Manitoba, Canada.
Stanley Twarog, 86 Church St., New Bedford, Mass.
C. A. Miller, 1661 Bush St., San Francisco, Calif.
Ernest Velting, 2418 St. Raymond Ave., Westchester, N. Y.
C. A. Clark, 384 S. 16th St., Cedar Rapids, Iowa.
D. W. Prichard, 167 Yarmouth Rd., Toronto, Canada.
A. Roy, 187 Beaubien, E. Montreal, Canada.
James Perry, 1748 Auseon Ave., Oakland, Calif.
Sam Miller, 931 Willow Ave., Hoboken, N. J.
J. A. Bell, Western Union Telegraph Co., Columbia, S. C.
Eugene E. Coleman, 168 Magnolia St., Providence, R. I.
F. E. Leppert, Box 36, Glenwillow, Ohio.
K. Schaffer, 97 St. Joseph Blvd., W. Montreal, Canada.
Norman Maire, 4026 Grizella St., Pittsburgh, Pa., Observatory, St.
Chas. H. Stahl, 283 Himrod St., Brooklyn, N. Y.
Paul A. Carlson, 26 Zelmer St., Buffalo, N. Y.
Fred W. Holderbach, 814 Isabella St., Newport, Ky.
E. C. Painter, Box 462, Homer, La.
Arthur Siebert, 8848 Yates Ave., Detroit, Mich.
Henry J. Pallat, 649 W. 5th St., Wahoo, Nebr.
H. E. Rocchiccioli, 2615 W. Grace St., Richmond, Va.
Morris Kessler, Box 63, Brookside, N. J.
J. S. Sanders, 445 Emory Ave., Trenton, N. J.
O. L. Menard, 102 Irene St., Joilet, Ill.
J. Briscoe, P. O. Box 715, Balboa, Calif.
Maurice F. Bell, 175 Morgan St., Fall River, Mass.
O. R. Smith, P. O. Box 571, Redwood City, Calif.
Leslie E. Walker, Brownfield, Pa.
E. H. Littell, Cleves, Ohio.
Ed. Tanney, 3527 Willys Parkway, Toledo, Ohio.
J. L. Rufty, 99 Ridgedale Rd., Atlanta, Ga.
Joseph Morris, 48 Lawn St., Pawtucket, R. I.
W. Seateherd, 404 St. Germaine Ave., Toronto, Ont., Canada.
E. B. Geagley, 133 W. 9th St., Cincinnati, Ohio.
B. P. Wallace, 127 Rosslyn Ave., S. Hamilton, Ont., Canada.
Theo. Hierl, 1247 Madison St., Brooklyn, N. Y.
Roy S. Down, 725 Albany Ave., Ogdensburg, N. Y.
Lemand Axelson, 8 Charter Oak St., S. Manchester, Conn.
B. F. Cavanagh, Box 154, Saunderstown, R. I.
Wm. Payne, 3215 O St., N. W. Washington, D. C.
W. E. Lowry, Box 874, Cushing, Okla.
W. Petts, Delson, Prov. Quebec, Canada.
D. I. Hightower, 230 E. Davis St., Decatur, Ga.
R. E. Nolan, 132 Elmwood Dr., Atlanta, Ga.
P. W. Mathews, 1907 St. Ives St., N. S. Pittsburgh, Pa.
Alfred La Porte, 17½ Pettis St., Providence, R. I.
Walter E. Pennoyer, 7 Hiuridis Place, Bloomfield, N. J.
F. L. DeMarco, 65 E. Third St., Atlanta, Ga.
W. M. Procos, 507 W. 2nd St., Stuttgart, Ark.
N. T. Chickering, 181 Main St., Delhi, N. Y.
J. W. Bannister, Delhi, Ont., Canada.
Alfred N. Meland, 408 "A" St., S. Moorhead, Minn.
H. B. Markell, 389 Manitoba Ave., Winnipeg, Man., Canada.
thur, Ont., Canada.
Eric Erickson, 108 Windermere Ave., Port Ar-
George Walters, 34 Paterson St., Jersey City, N. J.
John Kaiser, c-o M. S. Levy & Son, Paca & Lombard Sts., Baltimore, Md.
Wm. George Cosulas, 131 Livingston St., San Bernardina, Calif.
Bert German, Little River, Kansas.
Otto Adolph, 313 Hague St., Union City, N. J.
Fred P. Link, c-o Royal Baking Powder Co., 100 E. 42nd St., N. Y. C.
W. F. Byers, 2731 Payne Rd., Des Moines, Iowa.
Fred W. Hadden, Savannah, N. Y.
M. Kirkwood, R. R. 8, Box 230, Pittsburgh, Kansas.
S. Osmondson, Box 3, Willmar, Minn.
Daniel A. D'Alfonso, 265 E. 181st St., N. Y. C.
Allen Duncan, Box 31, Capital Hill Sta., Oklahoma City, Okla.
Roy Ault, Box 102, Glencoe, Ohio.
E. G. Brooks, 188 Emmons Ave., R. 3, Dearborn, Mich.
Wm. Gregory, 1267 Broadway, Flint, Mich.
James Biskop, 108 Hiram St., Milvale, Pa.
J. Fontaine, 2 Youville Suare, Montreal, Canada.
Chas. A. Leyck, Box 1003, Corpus Christi, Tex.
P. E. Woodman, 63 School St., Auburn, Me.
G. W. Smith, 2309 S. Lemon St., Sioux City, Ia.

Nothing Like It in South Carolina, Either

DIAMOND EDITOR:

I have just finished hooking up the 1926 Model Diamond of the Air. It is the first set I have ever tried to assemble and it sure does bring in DX stations. There is no other type of receiver in this part of the country to beat it.

F. L. RICHARDSON.
Salters Depot, S. C.

* * *

Diamond Equals His Super-Heterodyne Set

DIAMOND EDITOR:

I have just finished building the 1926 Model Diamond of the Air and in 2½ hours after completion, I had 23 stations on the loud speaker. I have a Super-Heterodyne receiver and I think the Diamond is equal to it for tone and power.

ARTHUR PHILLIPE.
1201 Clifton St., Winnipeg, Canada.

* * *

Hears All Over U. S. With Antenna in Attic

DIAMOND EDITOR:

I have built the 1926 Model Diamond of the Air and have received stations from every portion of the country, a piece of wire hung from the attic serving as an antenna. I can imagine what the set will bring in when a real good antenna is installed. I can separate stations with a 1 meter difference.

Thanks ever so much for the hookup.

J. E. KNICKELBEIN.
889 Maryland Ave., Milwaukee, Wis.

* * *

15-Year-Old Says Anyone Can Build It

DIAMOND EDITOR:

I have built the Diamond and it sure is some set. I have received stations from Los Angeles and N. Y. City both in the same night. I am only 15 years of age and think if I could build the set and make it work so wonderful that anybody could duplicate the results.

VIRGIL JUESCHE,
502 S. Monroe St.,
Enid, Okla.

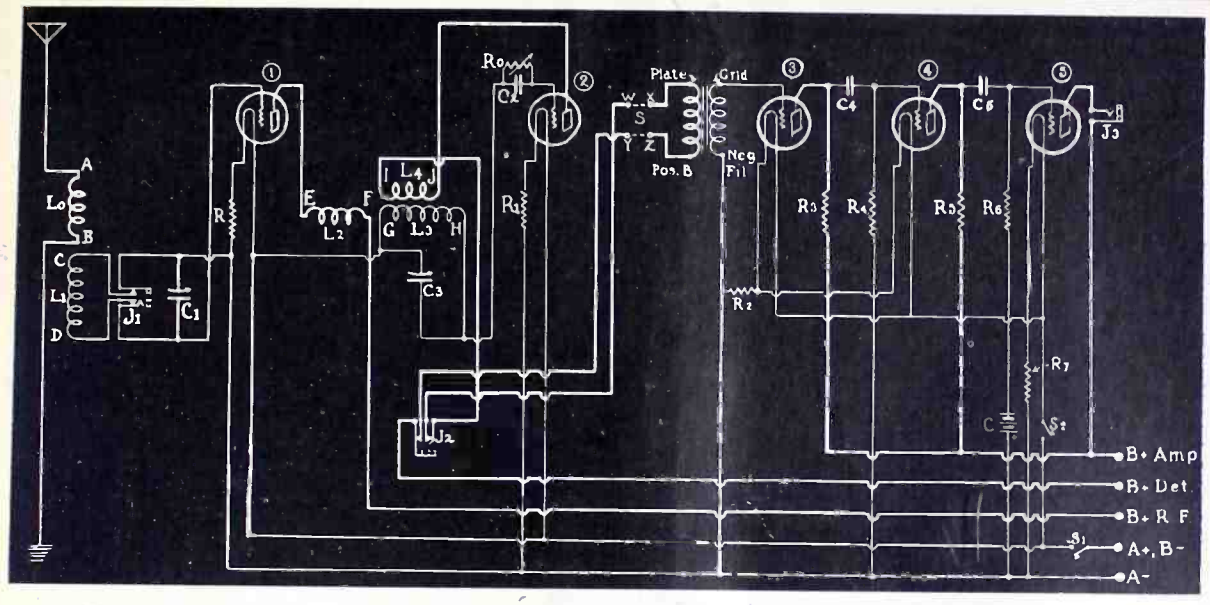
* * *

Builds Sets Two Years; Finds Diamond Best

DIAMOND EDITOR:

I have been building radio sets for the past two years and so far the best I have been able to build is the Diamond. With a good antenna and ground it is very selective and great for DX. I am right near several stations and can tune them all out. As to selectivity, WHAS, WLIT, WGY, WSB, CNRM, and PWX, all come through, while WOR is on.

C. E. BLAIR.
513 Bergen St., Harrison, N. J.



THE 1926 MODEL DIAMOND OF THE AIR, as diagrammed above (Fig. 1), is a little more flexible in the filament control, hence any who desire to build the Diamond should follow this diagram. All blueprints from now on will conform thereto. Also this wiring is embodied in the official booklet on how to build the set. The changes from the previous diagram are as follows: (1) Four filament ballasts are used instead of three, the four being R, R1 and R7, each No. 1A Amperite, and R2, a No. 112 Amperite. R7 is for the -01A tube. If a power tube is used in the last stage, get the right ballast for it, as explained in the official booklet. B+ RF is 90, B+ Det. is 45, B+ Amp. is 135. Connect B— and A+ at batteries.

The Diamond University

Questions on the 1926 Model Diamond of the Air Answered Free by RADIO WOOLD, *145 West 45th Street, New York City. Address Diamond Editor.*

PLEASE EXPLAIN how the detector jack and first audio transformer primary are wired and the reasons for the unusual hookup.—Terence Blake, Yonkers, N. Y.

One end of the tickler coil is connected to plate of the detector tube. This terminal of the coil L4 is designated J in the wiring diagrams. The other terminal of the tickler, designated I in the wiring diagrams, goes to the outside hooked spring of a double-circuit jack, J2 in the diagram. This jack is shown in Fig. 1, where the lead I is designated, too. The outside right angle (frame) of the jack goes to B plus detector. The inside jack prongs are connected so that each goes to a binding post on the socket shelf. Two other binding posts are connected respectively to the Plate and Pos. B posts of the Thordarson audio-transformer (post X to plate and post Z to Pos. B). The short pieces of bus bar, about 1½" each, connect the inside jack prong leads from their posts (W and Y) to X and Z. Take care to have the plate and lead go to W and the Pos. B lead to Y. Thus the jack may be used for a detector listening post, the switch S2 turning off the audio tubes. Also, by removing the two bus bar leads connecting the binding posts, an external detector circuit may be connected to the Diamond's audio-amplifier. This is very convenient for experimenters, who often desire to test out on a speaker some experimental detector circuit they have wired up. In that case remove the tubes from sockets 1 and 2, as no special means of opening this part of the filament wiring was deemed necessary. The official blueprint of the entire set wiring will aid you materially.

* * *

I HAVE built the 1926 Diamond of the Air and am not having very good luck. As soon as I place my hand near the dial controlling the 3-circuit tuner, a loud squawk is heard.—Peter Kress, 632 Boulevard, Bayonne, N. J.

See that the plate and the grid leads are not near the panel. Reverse the tickler leads. Reverse the leads to the grid leak. Reduce the voltage on the plate of the detector and the RF tubes. Shield the coil from the panel.

* * *

I WOULD like to ask some queries on the 1926 Model Diamond of the Air. (1)—When I put the phones in the detector jack I can hardly hear the signals. (2)—I cannot get the loop to work. (3)—Could I control the volume of the receiver by placing a rheostat in series with the negative leg of the filament of the detector tube?—H. E. Gordon, care The Farmer's Grain and Supply Co., Mercier, Kans.

(1)—See the answer to Mr. Snyder's query in the Jan. 30 issue. (2)—See the answer to Mr. Grant's query in the Jan. 30 issue. (3)—Yes, but the turning of the tickler knob should control the volume.

* * *

I HAVE built the 1926 Model Diamond of the Air, using the kit as specified by Herman Bernard. The complete wave-band is covered, but the volume on the high wave stations (above 450 meters) is poor.—Edward L. Richardson, Box 267, Coffetville, Kans.

Place a .001 mfd. fixed condenser across the primary of the audio-frequency transformer. Add 5 turns to the primary of the 3-circuit tuner.

* * *

I HAVE a Bruno form, which is 3" in diameter and would like to make an RFT, so that it will match the Bruno 99 3-circuit tuner that I have. This RFT is of course to be used in the 1926 Model Diamond of the Air.—Asa Leuley, 703 Ohio Ave., Erwin, Tenn.

The primary consists of 9 turns. The secondary consists of 45 turns, using No. 24 SCC wire.

* * *

PLEASE ANSWER the following queries in regard to the 1926 Model Diamond of the Air: (1)—When I pull out the A battery switch I get a ringing sound. (2)—I find that the set works better when the grid return of the detector tube is connected to the A plus instead of A minus. (3)—Does it matter if the B minus is connected to the A plus or A minus. (4)—Should the grid return of tubes 1, 3 and 4 go through R1 to A minus or through the filament of tube 5 to A plus? (5)—What voltage should the C battery have when using the same with 135 volts on the plates of the last two tubes?—H. Archer, 4055 Ellis Ave., Chicago, Ill.

(1)—Put cushions (soft rubber) under the sockets. This ringing sound is due to moving the elements of the tubes. A toggle switch is a solution. (2)—This is all right. (3)—Not materially. (4)—The grid return goes directly to A minus. (5) This depends on the tubes. For -01A use 4½ for second audio, 6 to 9 for last.

* * *

IN REGARD to the Diamond of the Air: (1)—Is not the 1-A Amperite the wrong one to use if a power tube is to be used in the last stage? (2)—If I wish to use the first two tubes, with the AF tubes out, then the first RF tube receives more than the required amount of filament current, as the ¾-ampere resistance controls the RF, the third and fourth tubes. Is this injurious to the tubes?—Sidney Noulgren, 42 McGovern Ave., Ashtabula, O.

(1)—Yes. Use the ½-ampere type, Amperite No. 112, for the UX112 power tube. Some power tubes (low mu) need no ballast. (2)—Yes, but this is only a temporary listening post and the difference is not important.

* * *

IS the Diamond Selective?—Fred Bernert, 367 75th St., Brooklyn, N. Y.

Yes.

A THOUGHT FOR THE WEEK

Distance getting is a fine thing in connection with a set, but enjoyment is often more a matter of good digestion than superlative technical value.

RADIO WORLD

The Link Connecting Radio Fan, Dealer, Jobber, Distributor and Manufacturer

Radio World's Slogan: "A radio set for every home."

TELEPHONES BRYANT 0558, 0559
PUBLISHED EVERY WEDNESDAY
(Dated Saturday of same week)
FROM PUBLICATION OFFICE
HENNESSY RADIO PUBLICATION CORPORATION
145 WEST 45th STREET, NEW YORK, N. Y.
(Just East of Broadway)
ROLAND BURKE HENNESSY, President
M. B. HENNESSY, Vice-President
FRED S. CLARK, Secretary and Manager
European Representatives: The International News Co. Breams Bldgs., Chancery Lane, London, Eng.
Paris, France: Brentano's, 38 Avenue de l'Opera
Chicago: A. T. Sears & Son, Peoples Gas Bldg.
Cincinnati Office: Radio World, 304 Provident Bk. Bldg., 7th and Vine Sts. Telephone Canal 753 and 379.
San Francisco: Lloyd B. Chappell, 656 O'Farrell St.

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MANAGING EDITOR, Herman Bernard
TECHNICAL EDITOR, Lewis Winner
CONTRIBUTING EDITOR, John F. Rider

SUBSCRIPTION RATES

Fifteen cents a copy. $6.00 a year. $3.00 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. Always give old address also. State whether subscription is new or a renewal.

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General Advertising

1 Page, 7¼"x11"	462 lines	$300.00
½ Page, 7¼"x5⅛"	231 lines	150.00
½ Page, 3¼" D. C.	231 lines	150.00
¼ Page, 4⅛" D. C.	115 lines	75.00
1 Column, 2¼"x11"	154 lines	100.00
1 Inch		10.00
Per Agate Line		.75

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52 consecutive issues	20%
26 times consecutively or E. O. W. one year	15%
4 consecutive issues	10%

WEEKLY, dated each Saturday, published Wednesday. Advertising forms close Tuesday, eleven days in advance of date of issue.

CLASSIFIED ADVERTISEMENTS

Ten cents per word. Minimum, 10 words. Cash with order. Business Opportunities ten cents per word, $1.00 minimum.

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

FEBRUARY 6, 1926

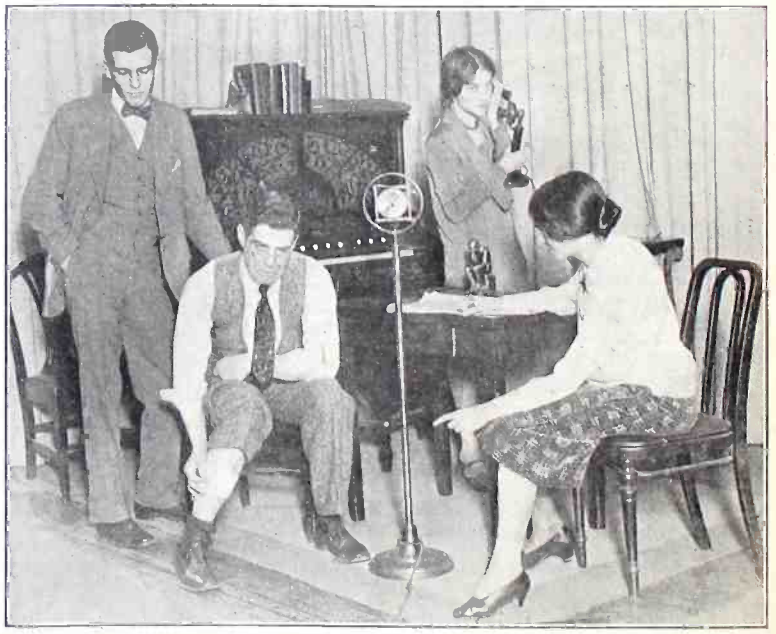
REALISM CAUSES STIR

WHILE broadcasting has not yet developed to that point where famous teachers conduct schools on how best to fit one'self for microphone performance, there are two schools of thought as to how far realism need be pursued for best results. For instance, there is one school exemplified by the two photographs published herewith, that believes all tokens should be as realistic as possible, including dress, environment and facial expression, for such are most conducive to bringing the desired message or effect home to the listening public.

On the other hand are the mentalists, who assert that it is not necessary for a cast to be dressed for their particular parts to convince the listening public that the performance is really life-like. They argue that dress, motion, facial expression and the like are intended to appeal only to the eye, and as the eye as yet cannot penetrate the studio from the family hearth, dressing for the part and otherwise adopting outward evidences of realism are folderol.

Realism Practised in Studios, But Mentalists Ridicule It

EMOTION, expressed facially as well as vocally, by Peggy Hopkins Joyce before the microphone. (Foto Topics).



THE first radio play, "SUE 'EM," winner of a test conducted by station WGBS, New York, was put on the air by three stations, WGBS, New York; WIP, Philadelphia, Pa., and WGY, Schenectady, by members of the Provincetown Players. Above we see three of the cast of "SUE 'EM" sending the drama out on the air with the announcer at left. (Kadel & Herbert)

What Kind of Programs Do You Like the Best?

A NATIONAL canvass has been started by RADIO WORLD to ascertain what type of program meets the preference of the majority of listeners. Everybody who listens to radio programs is invited to send in a statement of his own preferences, and a coupon is published herewith, to facilitate answering and compilation. However, together with the filled-out coupon, all are requested to write letters expressing their views, if they care to treat the subject more extensively than would be possible under the heading "Remarks" in the subjoined coupon.

From time to time results of the tally will be published.

The kind of entertainment and instruction to offer to the public is a constant and important problem confronting broadcasting stations. Later on a plan of co-operation with stations will be announced, so that the expression of the American public on the program question, as obtained by RADIO WORLD, will actually make itself felt in the consequent offering of such programs as popular choice dictates. Thus when you fill out and send in the coupon you are doing a great deal toward helping to get the very kind of a program you want to hear.

Criticism is heard concerning radio programs, although they are improving all the time. A year or so ago mediocre programs were the rule. Today some of the smaller stations still are inflicting some poor programs on the radio public, perhaps because they have not ascertained what programs are liked the most. Probably in different parts of the country the public mind is different on the program question, just as it differs on political subjects. To date no national canvass, in the nature of a "program election," has ever been conducted on a substantial scale.

Everybody who listens to programs should accept the franchise to ballot on the subject. Besides, all who so desire should go into the program question in detail, giving their personal views, and even passing comment on specific performers at given stations, expressing either praise or adverse criticism, for the only way to obtain a reformation where it is needed is to state opinions frankly.

Here are some letters received by RADIO WORLD's Program Editor on this all-important subject:

* * *

Too Much Jazz for Him; Better Voices Advocated

PROGRAM EDITOR:

There is too much jazz music on the air. I live in New York City and I find night after night, from 10 to 12, there is scarcely any choice among local stations, for it's a case of this jazz orchestra or that jazz orchestra, and that's all. Some persons, like myself, while appreciating occasional jazz music, do not like to be precluded from hearing any other type of entertainment for two important hours of the night.

It strikes me that some stations might get a suddenly greater audience by not having a jazz orchestra play during the conventional jazz hours of the night. Some accomplished singers and some symphonic music would be most welcome at that time.

I find that it is common to have a so-called singer in almost every jazz orchestra. Sometimes a pair of alleged singers perform. They are regular instrumental members of the orchestra, and their singing is known technically as "incidental." Indeed, in point of fact and substance, it is most incidental, not being worth listening to. It is hard indeed to get a combination of instrumental and vocal talent in one man, we all know, and at the salary paid to a musician in a jazz orchestra the instrumental talent is likely to exceed the vocal accomplishment. Hence jazz orchestra leaders should make certain that a singer can sing before offering him to a large audience. There are a few exceptions to the inferiority of the voices of the instrument players, but jazz leaders should not feel that the exceptions are so numerous as to approximate unanimity!

I am glad to note that programs are improving all the while and that the commercial instincts behind many good programs find themselves rewarded in offering such excellent entertainment. I refer particularly to the Atwater Kent Music Hour, the Eveready Hour, the Victor Hour and the Silvertown Cord Orchestra. We need not fear the indirect advertising element in radio programs, for it has done much to lift programs from the indifferent plane of a few short months ago.

JAMES ENGLANDER,
16 West 8th Street,
New York City.

* * *

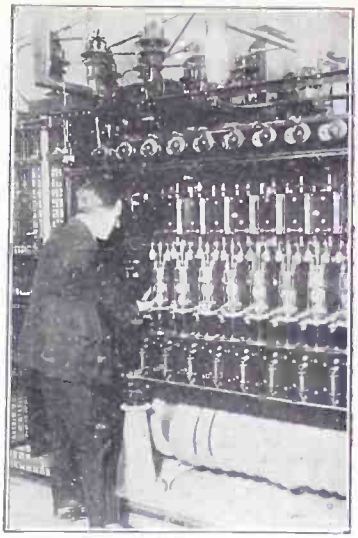
America Wants Jazz; Girl Offers Proof

PROGRAM EDITOR:

Jazz orchestras are one of the delightful attractions of the radio. If it were not for so much jazz being played not so many radio sets would be in use. I believe that the American musical temperament is decidedly pro-jazz, for jazz represents a proven phase of American life. Indeed, all the foreign countries have taken to American jazz, even Italy, the home of opera, and it would not be sensible to assume that our own people do not enjoy their own music so much as do foreigners. Of course programs should not consist exclusively of jazz, but there should be a plenitude of it, as there is now, and I do not believe that the stations are overdoing it. I believe that more requests are received by jazz orchestras for the rendition of particular pieces than by symphonic orchestras, soloists, etc. Some classical and semi-classical music should be included, but it can not be said within the bounds of accuracy that the American people want more classical music and less jazz. The sale of jazz music in all its forms—sheet music, phonograph records, player-piano rolls, etc.—confirms the American choice, and radio should not be considered as anything apart from these other forms as a source of preference determination.

MARGARET CZETO,
763 Fifty-fourth St.,
Brooklyn, N. Y.

100 KW. Code Station



A GENERAL view of the power unit in the new and world's most powerful commercial wireless station, at Hillmorton, England, near Rugby. The station opened on New Year's day. The wavelength is 6,000 meters, power 100 kw. (International Newsreel)

Program Editor, RADIO WORLD, 145 *West 45th Street, New York City:*

My preference for entertainment and instruction on the radio is as follows, the numbers next to the listed items representing the order of preference:

Grand opera.....	Ringside boxing report.....	Football game.....
Jazz orchestra.....		Hockey match.....
Talk	Classical instrumental solo.....	Recitation .....
State subject of talk here.....	State kind here.....	Musical comedy (stage) .....
Classical vocal solo	Jazz songs vocal	Short play (drama) .....
State kind here.....	Waltz (orchestral).....	Short play (comedy) .....
Musical saw.....	Symphony concert.....	Banquets, with speeches .....
Vocal duet.....	Instrumental duet.....	Sermons .....
Vocal trio.....	Instrumental trio.....	Market report.....
Vocal quartet.....	Instrumental quartet.....	Weather report.....
Questions and answers on world topics.....	Brass quartet.....	Organ recital.....
	Bedtime story.....	
	Baseball game.....	

If you particularly dislike any of the above listed offerings, write "No" on the dotted line.

Other offerings (not listed above).....

.....

Remarks (if any).....

.....

.....

Fill out and mail this coupon today!

Name .....

Address .....

City..... **State**.....

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.

Trade Service Editor,
RADIO WORLD,
145 West 45th St., N. Y. City.

I desire to receive radio literature.

Name .....
City or town.....
State .....
Are you a dealer?.....
If not, who is your dealer?
His Name .....
His Address .....

George Davis, Box 346, Station A, Los Angeles, Cal.
W. A. Morris, Elkton, O.
W. W. Adams, Box 78 Lynchburg, Va.
F. L. Krause, 417 Howard St., Syracuse, N. Y.
Wm. Wetcraft, 729 Green St., Philadelphia, Pa.
Walter Weir, 1401 E. Vilas St., Guthrie, Okla.
J. P. Donough, Collins Bay, Ontario, Canada. (Dealer.)
Glen Nichols, 239 Florence St., Otsego, Mich.
H. M. Dahlquist, Jamestown, N. Y.
Scott Nixon, 104 Masonic Bldg., Augusta, Ga.
J. W. Cunleff, Jr., Tarrant City, Ala. (Dealer.)
F. P. Ronnan, 37 Sackville St., Halifax, N. S., Canada. (Dealer.)
Henry T. Hill, 230 Peoples Exchange Bank, Charleston, W. Va.
J. Biehler, Madeira, O.
W. E. Hamilton, 2129 Franklin Ave., Springfield, Mo.
Chantes C. Hicks, Martinsville, Ind.
Edgar R. Thomson, 1534 First Ave., Watervliet, N. Y.
Dan Kennedy, Christopher, Ill.
M. O. Dellinger, Reynolds, Ind.
C. B. Richardson, P. O. Box 225, Yonkers, N. Y.
Norton E. Dennis, Wilberforce, O.
W. J. O'Brien, 14 Sturdevant St., Johnson City, N. Y. (Dealer.)
Lou Sarvasio, 339 Jackson Ave., Des Moines, Ia.
A. Fabris, 4116 Ave. R., Galveston, Tex.
A. C. Beech, Belvidere, N. J.
Edward Vaughn, Dallas Ave., Pittsburgh, Pa.
Clare S. Bloss, Swartz Creek, Mich.
Harold Vandervort, R4, Morgantown, W. Va.
C. A. Mays, 7 Quarry St., Pa.
Walter D. F., Barber, R. D. 3, Grove City, Pa.
Earl M. Skaggs, Evansville, Ind.
D-S Radio Electric Co., Wellington, Tex. (Dealers.)
Warren J. Beale, 661 Merreck Ave., Zanesville, O.
Lyman Stucker, 1442 Newton St., Akron, O.
Emil Civach, Yankton, S. D. (Dealer.)
C. Owellen, 2 Evergreen St., Rochester, N. Y.
J. A. Campeau, Esq., 34 Agilvie St., Eastview, Ont., Canada.
F. N. Bemis, 144 Central St., Saugus, Mass.
James Kring, Indiana, Pa.
Flat Rate Auto Electric, 760 Nelson St., Vancouver, B. C. (Dealers.)
Daniel Midivell, 759 Connecticut Ave., Bridgeport, Conn.
Peoples Yarn Shop, 623 Hamilton Road, London, Ontario, Canada.
S. T. Searcy, 331 South Bannock St., Denver, Colo.
R. D. Emmett, Clark, S. D.
Leo M. Kosen, 314 East 100th St., N. Y. City.
Berkley M. Phelps, New Preston, Conn. (Dealer.)
F. H. Bumpus, 621 East Genessee St., Syracuse, N. Y.
M. M. Hogle, Box 111, Estelline, Tex.
H. H. Ewald, Wairfield, Ill. (Dealer.)
John V. Witt, 1255 Wilkins Ave., Los Angeles, Cal.
H. Oberle, 2914 Alford St., Louisville, Ky.
Guy L. Howard, 6707 Fir Ave., Cleveland, O.
W. A. Grafton, 2319 California Ave., Seattle.
Charles Whittemore, 4 Temple St., Norway, Me.
R. E. Beisiegel, 31 Hard St., Westville, Conn.
W. M. Fitzpatrick, 2033 McCoy Ave., Covington, Ky.
J. Osborn Hodge, Box 66, Marion, Ky.
Anthony R. Jenkins, 781 Poland Ave., Youngstown, O.
Orgo H. Lesser Co., Hippodrome Arcade, Youngstown, O. (Dealers.)
William Maines, 305 Hanover St., South Pottstown, Pa.
Mathew Leuscher, Jordon, Mont.
Arthur Meyers, 162 Breckenridge St., Buffalo, N. Y.
C. W. Massie, 2721 East Broad St., Richmond, Va.
Charles McCauley, Versailles, Ken.
New England Stock Co., Haverhill, Mass. (Dealer.)
J. D. Jonson, 438 South First Ave., Mt. Vernon, N. Y.
Herman Short, Bethany, Okla. (Dealer.)
E. C. Hightower, 908 E. Powell St., Ft. Worth, Tex.
The Radio Inn, 214 North Alamo Ave., Bell, Cal. (Dealers.)
W. F. Tritle, Winnebago, Ill. (Dealer.)

THE RADIO TRADE

Favorite Theme On Train and Boat is "My Set"

REPRESENTATIVES of RADIO WORLD, under the personal leadership of Fred S. Clark, manager of RADIO WORLD, have just completed trips which took them to all parts of the country. Manufacturing plants were visited, to determine the state of the industry, and sales promotion was discussed with leading radio executives. These visits necessitated much traveling. Mr. Clark covered territory East of the Mississippi, while his aides traveled to other parts of the United States. Regarding the subject most discussed aboard trains and boats and on auto trips, it was agreed by all that "My Set" occupied first position. For instance, Mr. Clark reported:

"I had to do considerable traveling, and several of my trips were overnight ones aboard train. Naturally, I fell into conversation with many passengers.

On Common Ground

"I did not disclose my business connections. Nevertheless I found that the common ground of conversation among strangers was what kind of a set they had, how it worked and what stations were tuned in regularly or occasionally. A great interest in distance reception was noticeable, thus tending to disaffirm the assertion that fans are losing interest in DX. Women, no less than men, found that radio was an easy topic of discussion, and the interest in it was shared by all.

"Some whom I met owned factory-made sets, others used sets that they had made themselves. Quite a few of both classes later turned out to be weekly readers of RADIO WORLD.

"One man who had a factory-made set for family use was an ardent hookup fan and had built four sets within a year. Also, he told me, he had bought four manufactured sets during that time. If every family produced such a large radio turnover each year we would have to turn this country into one huge radio factory.

Best Field For Sales

"After interviewing scores of passengers I found my own view corroborated—that radio set owners are an aspiring lot and are always seeking something better. Therefore the radio set owner is the best customer for the radio trade, for, like the automobile owner, he wants a better model each year. Whether a man buys a factory-made set or builds his own set, he is a likely customer. The radio is something an owner gets more and more enthusiastic over, since it is not in the toy class, where surfeit soon sets in.

Business is Good

"I found business conditions in the radio line very good, especially in the Middle West. There had been a slight let-up following the Christmas season, but business had perked up very handsomely by the time I had begun my trip, and energetic plans were being laid for large sales campaigns to carry manufacturers at full blast until May, with continued activity during the summer."

WHICH COILS ARE BEST?

The Bureau of Standards tested six, using different kind of wire on each. The results are very fully set forth in Jan. 16 and 30 issues of RADIO WORLD. Send 30c for both. RADIO WORLD, 145 West 45th St., New York City.

Henry S. Shaw Named General Radio Chairman

At the annual meeting of the General Radio Co., the position of Chairman of the Board of Directors was created to meet the growth of the company. Henry S. Shaw, Treasurer of the company for the past eight years, was elected to this position. H. B. Richmond, formerly Secretary and Assistant Treasurer, was elected Treasurer. No other change was made in the officers. Melville Eastham, who has served as President for the past eleven years, continues in that office and E. H. Locke enters his sixth year as Vice-President, in charge of manufacturing.

During the past year the company completed its new factory at Cambridge, Mass., which provides 50,000 square feet of ideal manufacturing space. The company will continue with the development and manufacture of scientific apparatus for the radio and telephone fields, and with the well known GR line of high quality radio parts.

NEW CORPORATIONS

Radio World Sales and Supply, Philadelphia, Pa., $30,000. (Corporation Guarantee and Trust Co., Wilmington, Del.)

Orthodyne Radio Manufacturing Co., N. Y. City, $10,000; M. E. Phillips, H. Gassman, B. Frimarck. (Atty., N. Berk, 63 Park Row, N. Y. City.)

Independent Radio Corp., Newark, N. J., radio supplies. $50,000; Nicholas Striglia, James Cappiello, Rose Capiello, Newark, N. J. (Atty., J. Victor D'Aloia, Newark, N. J.)

Tri-Boro Radio Manufacturing Corp., N. Y. City, $20,000; T. Friedman, E. and S. Schlenoff. (Atty. H. H. Hunter, 220 5th Ave., N. Y. City.)

A. & B. Electric and Radio Co., N. Y. City, $10,000; S. A. Skoff, I. and F. Brodkin. (Atty., I. J. Rose, 15 Park Row, N. Y. City).

CAPITAL INCREASES

Graybar Electric Co., N. Y. City, $10,000 to $15,000.

Coming Events

MAR 8 to 13—Annual convention and show, Second District Council, A. R. R. L., Hotel Pennsylvania, N. Y. City.

Business Opportunities Radio and Electrical

Rates: 10c per word; Minimum, $1.00; Cash with order

A RADIO STORE AND BATTERY CHARGing station, combined with lamp shade and novelty business in one of the fastest growing sections of Long Island, only twenty minutes from Times Square, established two years, living quarters in rear; personal furniture, fixtures, stock at bargain; lease runs two years more; can be renewed. Address Box A. A., RADIO WORLD.

RADIO, SPORTING GOODS AND MUSIC store doing big business on busiest street in Harlem; selling because of other interests. Box B. B., RADIO WORLD.

RADIO JOBBING BUSINESS IN GOOD condition for sale, due to death; cash required about $2,500. Box C. C. C., RADIO WORLD.

Stations Need Large Musical Library, and It's Expensive

PITTSBURGH.

Equipping a musical library to meet the demands of aerial entertainment is a task of no mean calibre.

Taking KDKA as an example, its library, translated into monetary terms, represents an investment in excess of $5,000.

The repertory that this section has to draw from is one of the most extensive collections of manuscripts and music ever assembled by a single organization. Everything of importance, from Alpha to Omega in things musical, has a place in this library—which has become a source adequate to the diversified demands of KDKA's vast audience.

The repertory embraces all the oratorios, grand and comic operas, salon music, concertos, dance and classical selections, hymns and roundelays, ballads and dirges, music for solo instruments, etc.

How to Improve Your Reception

A wire hung in the rooms of a frame or brick house frequently makes a very satisfactory aerial. The wood and brick being almost non-existent as far as the radio impulses are concerned, the waves pass through the walls, excite the aerial, and produce music in the receiving set. However, if the house has a steel framework, or is made of poured concrete with twisted steel netting imbedded in the walls, the waves will be more or less absorbed or reflected by the huge shield which the metalwork forms. An outside or exposed wire generally gives superior results in cases of this kind.

The "loop" type of indoor aerial, which consists of a number of turns of wire on a framework rarely more than two feet a side, likewise depends for its operation on the penetrating power of radio waves. Possessing comparatively little collecting surface, it absorbs less energy than the larger stretched wires, and it is this fact which limits its use to radio receivers of special construction.

The appearance a few years ago of loop-equipped sets was responsible, explains A. J. Reynolds, for the widely repeated suggestion about "keeping the window open in order to hear something." At first the advice was offered in perfect seriousness to owners of loop sets, but it quickly developed into a stereotyped radio joke when people discovered that open windows brought in nothing more than fresh air.

Steel Has Effect

As with other indoor aerials, the "loop" is greatly influenced by the mechanical nature of the building in which it is used. It is generally most successful in non-metal houses, and most likely to prove ineffectual in large steel buildings or in districts where a great number of metal structures exists. Of all types of aerials, in fact, the loop is most easily affected by local additions, and the operation of a loop-equipped receiver is entirely dependent on such radio signals as may penetrate to that particular aerial. In certain areas, such as crowded apartment house districts, interference may be very high and signal strength very low, and it is then desirable to "pipe-in" signals to the set from outside or other aerials connected or coupled to the main loop.

The rule is not an invariable one, though, as individual conditions vary to a surprising extent. Loop aerial sets have been taken into thick steel bank vaults, and worked excellently in them; and there is an authentic case of a set installed in a New York skyscraper office, from whose windows the actual aerials of two powerful broadcasting stations were visible, which absolutely failed to produce even weak signals from those two stations.

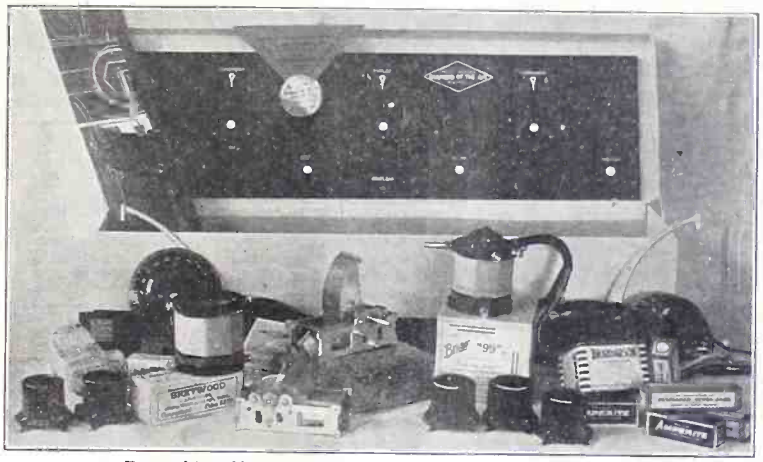
The universal susceptibility of bodies of metal to radio waves accounts for the success of many odd types of aerials. Umbrella frames, large tin pans, chicken and pigeon coops, farm fences, window screens, perambulator and automobile chassis, metal signs and signboards, and particularly fire-escapes have all been connected to radio receivers, and are known to have acted as excellent radio aerials.

Fans everywhere reported EUROPE on their Diamond of the Air sets made from the 1926

DIAMOND OF THE AIR KIT

A Popular Kit at a Popular Price.. $35.00

Each B.C.L. boxed and sealed Kit bears the personal seal and signature of Herman Bernard. This is your assurance and guarantee that all parts included are the best obtainable and will give you a balanced receiver capable of great distance, combined with wonderful tonal qualities—a perfect receiver, worthy of the endorsement of the thirteen leading parts manufacturers it bears.



Everything Necessary Included in Each Kit as Shown.

Important!

Due to the tremendous demand now prevalent for the Diamond of the Air Kits, we find it impossible to adhere to our policy of making shipments the same day we receive the order, any longer. Shipments will have to go forward the next day or the day following. Our shipping department is working in two shifts to keep up with the demand, and we therefore solicit our patrons' indulgence to be patient.

We are pleased to announce that each kit will contain Sidney E. Finkelstein's special 16-page booklet, with a new full-size blueprint, which gives all data necessary for the construction, care and operation of the Diamond of the Air.

We are able to supply the consumers with a copy at 50 cents each.

OUR MONEY-SAVING SPECIALS

KITS

Bruno 3-Tube	$18.00
Bruno 4-Tube	22.00
Ambassador 3-Tube	16.00
Ambassador 4-Tube	20.00
Browning Drake	19.00
Freshman T. R. F.	7.95
Marcudyne Kits	22.50
Bernard's Loud Boy	9.65

CONDENSERS

Bruno No. 18-22 Plate	$4.25
Hammarlund 23 P.S.L.F.	4.10
Hammarlund 11-43 Plate Ver.	2.25
General Instrument, Any Size	2.40
U. S. Tool 11-18-23-43 Plate Ver.	1.75
Heath 11-23-43 Plate Ver.	1.75
Murdock Enclosed 23-43 Plate	.95
U. S. L. 23-43 Plate Ver.	1.50
Preferred 11-23 Plate	1.35
Preferred 11-23 Plate Ver.	1.65
Amsco 17 Plate S. L. F.	2.75
Amsco 23 Plate S. L. F.	3.25
King Cardwell 11 Plate	2.10
Freshman Mercury	.95
Manhattan 13-23 Plate Ver.	2.95
Pacent 11-43 Plate	.75
Streamline S. L. F. .0005	2.50
Streamline S. L. F. .00035	2.25
Streamline S. L. F. .00025	2.00
Wireless .0005 S. L. F.	1.95
Garco 23 Plate Ver.	1.95
Comsco, All Sizes, Ver.	1.25

TRANSFORMERS

All American 10 to 1	$2.45
Jefferson Star 3 to 1	1.50
Amertran	3.75
Modern 4 to 1	1.95
Modern 10 to 1	2.25
Modern Push Pull, Pair	6.50
Thordarson 3 to 1	2.95
Thordarson 6 to 1	3.10
Thordarson Push Pull, Pr.	8.50
Thordarson Autoformer	$3.75
Erla 3 to 1, 6 to 1	2.95
Federal No. 65 or 65A	2.95
Rauland Lyric	6.25
Modern Symphony	4.50
Jefferson Star 6 to 1	2.10
Crescent 6 to 1, 3 to 1	2.10

VERNIER DIALS

Marco	$1.60
Erla	1.95
Amsco	1.50
Univernier	.75
Gee-Haw	1.95
B. M. S.	1.10
Accuratune	2.75
Pacent—Gold or Silver	1.95
National 3¾"	1.85

LOUD SPEAKER UNITS

Baldwin (Type C)	$3.95
Baldwin (Type H)	4.95
Morrison	3.25
Western Electric	6.75
Baldwin Phones	7.25

LOUD SPEAKERS

Brandes Table Talker	$4.50
Farrand Jr.	16.50
Jewett Super	19.50
Manhattan, Large	11.50
Acme	22.50
Bosch Jr.	14.50
Thorola Jr.	13.95
Magnavox M4	10.95
Supreme Concert	13.95
B. C. L. Horn—Special	5.50
B. C. L. Cone Speaker 20"	14.95
Crosley Cone	13.25

DIALS

Naald Bakelite 4"	$0.50
Fada Bakelite 4"	.45
Freed Elsemann Bakelite 4"	.45
Garod Bakelite 4"	.45
Pathe 2", 3", 4"	.25

TUBES

R. C. A. 201-A	$2.25
Cunningham	2.25
DeForest	2.25
New Venus Blue, 201-A	1.50
Schickerling	2.25

MISCELLANEOUS

Cutler-Hammer 6-ohm Ver.	$0.59
Turn-It Grid Leak	.65
U. X. Adapter	.30
Pacent Plug	.25
Soldering Iron	.95
"A" Battery Switch	.25
Jones' Single and Double Jacks	.40
Bruno Binding Post (per pkge. of 12)	.40
Lightning Arrester	.40
Battery Cable	.45
Pacent Rheostat	.60
Dubilier By-Pass Con., 0.25 mfd.	.70
D. P. D. T. Switches	.50
WD-11 Adapters	.50
S. P. D. T. Switches	.45
Phone Plugs	.25
Bezels 1" Nickel	.05
Bezels 1" Gold	.10
Glass Insulator	.20
Toggle Switch	.20
Bruno Inductance Switch (14 Point)	.35
Bruno "66"	2.25
Hydrometers	.60
Bell Wire (Half Pound)	.40
Na-ald UX Adapters	.35
Aerial Kit (Complete)	2.50
Crystal Detector	.50
Double Jacks	.40
Single Jacks	.30
Westinghouse R. C. Set (2 only)	29.50
Neutralizing Cond.	.35
Stelnite Eliminator	.95
Continental Midget Cond.	1.10
Continental Neutralizer	$0.45
Single Mount	.15
Double Mount	.30
Extension Plug	.35
Voltmeter Leader 0-50 Volts	.75
Voltmeter Ammeter Combination	1.10
Tower Scientific Headset	1.95
Spitfire Scientific Headset	2.95
Triple Coil Mount	.95
Amrad Variometer	1.25
Betts & Betts Loop	2.50
Bruno WD-11 Socket	.25
Davfan Potentiometer 400 ohm	.35
3" Dial	.20

PANELS

	Hard Rubber	Radion Mahoganite
7 x 10	$0.50	$0.65
7 x 12	.60	.90
7 x 14	.75	1.00
7 x 18	.95	1.35
7 x 21	1.25	1.65
7 x 24	1.35	1.90
7 x 26	1.50	2.25

Drilled and Engraved for Diamond of the Air.... $2.65

Powertone, 7 x 18, Drilled and Engraved Panel.... 2.15

3-Tube Bruno, 7 x 18, Drilled and Engraved Panel 1.45

SOCKETS—BAKELITE

Federal	$0.65
Naald De Luxe	.45
Hoosick Falls	.50
Hoosick Falls 199	.35
Hoosick Falls Triple 199	.95
Eby UX	.60
Pacent UX Universal	.55

Write for FREE Catalogue!

B-C-L RADIO SERVICE CO., 221 FULTON STREET, N. Y. C.

Dah—Dit—Dah—Dit—Dah!

By Irving Philip Wolfe

2APJ

3 ADZ sure socks out with his transmitter. He is one of the loudest 3's heard in the second district. Of course his QRH is 40 meters.

* * *

Speaking of DX on 40 meters how about 2 CYX, who worked the Swedish naval station SMYY in broad daylight, using a fiver with very low input. The conversation started at 4:20 p. m. EST and finished at about 5 p. m. SMYY is on 45 meters and CYX is on 38.5.

* * *

The Vancouver American Radio Relay League Vigilance Committee reports that through efforts Vancouver has been practically safeguarded against radio interference, such as violet and x-ray, power leaks and other troubles. Another club that is doing much to keep such disturbance out of its locality is the Bronx Radio Club of New York City. With a special receiver and an automobile they are regularly called out to "clear up the air."

* * *

9 OH has a raw AC note that is heard every evening in the second district. While working him recently I found that even the most powerful locals couldn't drown him out. This includes 2 AG with his brute force transmitter.

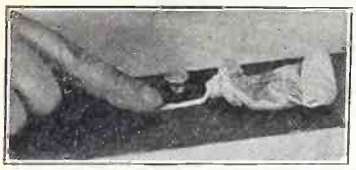
* * *

RDW, a Russian station, is now on the air on an "ancient" wavelength, 1,450 meters. If those fellows would get down to 40 they might do some real DX.

* * *

Many amateurs have been noticed below 37.5 meters. If some of these fellows would get wavemeters and get in the band they would find DX lots better and they would stop QRMing the DX for the rest of the gang.

Radio Toothpaste



TOOTHPASTE may be used to plug up a small hole in a panel or socket shelf. After it hardens, blacken it with shellac.

THE FENWAY

(*Concluded from page 5*)

demonstrate, provided you assemble the individual parts specified in each article of this series.

Next week I will tell you how to test the oscillator along with the first two tubes. I will also explain just what I mean by a "perfect medium frequency amplifier."

But don't wait for the finish of these articles; get started right now, and—good luck!

[Part II of this article on the construction of the Fenway will be published in next week's issue of Radio World, *dated February 13.]*

Municipal Station Opens in Pensacola

By J. E. FRENKEL

The City of Pensacola, Florida, has opened its Municipal Radio Broadcasting Station.

WCOA—"Wonderful City of Advantages"—are the call letters of the station.

The power of the station is 500 watts.

The studio is beautifully draped in light gray corduroy velvet. The ceiling represents the period of Louis XVI.

The wavelength of 222 meters has been assigned to the station.

TWO-FOR-ONE SUBSCRIPTION OFFER

Radio World has made arrangements

—To offer a year's subscription FREE for any one of the following publications with one year's subscription for RADIO WORLD:

—POPULAR RADIO or
—RADIO BROADCAST or
—SCIENCE AND INVENTION or
—RADIO NEWS
—RADIO DEALER or
—RADIO JOURNAL or
—RADIO (San Francisco) or
—RADIO AGE
—COLLIER'S
—BOYS' LIFE

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AID TO CRYSTAL SELECTIVITY

WASHINGTON.

In Radio receiving circuits employing a crystal detector, the sharpness of tuning and selectivity of the set in broadcast reception will be greatly improved if the detector is shunted across approximately one-half the inductance coil, according to the Bureau of Standards.

THE JOYFUL THOUGHT By Dan Napoli

Hoover Asks Set Gifts to Lighthouse Keepers

WASHINGTON.

A plea for the gift of radio sets to lighthouse keepers was made by Secretary of Commerce Hoover. He suggested that much happiness would be added to the dreary lives of those in charge of the 720 lighthouses, in secluded parts of the nation, if the public contributed sets to be sent to them.

Mr. Hoover described the lighthouse keepers as the "shut-ins of the first water," many of whom were out of all communication with the rest of the world for extended periods. Very few, he said, even had radio receiving sets, as they were not paid very much by the Government.

Powerful sets would be necessary for some of the lighthouses, Mr. Hoover said, because of their distance from sending stations. He mentioned as an example the lighthouse service in the Aleutian Islands, off the Alaskan coast. If sets are sent to the lighthouse service at Washington they will be distributed.

JAPAN BANS THE FOREIGN

WASHINGTON.

A survey taken of regulations in some countries governing the use of receiving sets reveals peculiar requirements. In Japan, for instance, to get a license to operate a radio receiver, the listener must promise to tune in only Japanese stations. In New Zealand, the fan must be over 14 years of age to get a license. In Greece, the fan must be a subject of that country. In other countries, fans must prove themselves trustworthy and of good conduct

Boston Symphony Broadcasts Because Hall Is Too Small

BOSTON.

For the first time in its history the Boston Symphony Orchestra is broadcasting its regular series of twelve winter concerts. The complete orchestra went on the air from Station WEEI and every Saturday evening thereafter it will be heard by radio until the end of the season.

The fact that season ticket holders have completely filled Symphony Hall for the past two seasons, to the exclusion of the general public, was a determining factor of the trustees to authorize the broadcast.

Panel Camouflage

A PANEL or strip with a hole in it you desire to disguise may be filled in with a cork, which is cut off when the bottom of the cork is flush with panel front. Then put black shellac on the cork at panel front. (Hayden).

WHAT IS A DAMPING?

Damping consists of a gradual decrease in the height of a radio-frequency wave. When damping occurs in the antenna circuit, it is known as decrement. When damping appears in the secondary or closed circuit, it is known as quenching. A receiver, which has values of quenching will have a low degree of decrement. This means that the set will tune sharply.

HERMAN BERNARD, managing editor of RADIO WORLD, broadcasts every Friday at 7 p. m., from WGBS, Gimbel Bros., N. Y. City, 315.6 meters. He discusses "What's Your Radio Problem?" Listen in!

How to Remedy Trouble In the Antennatrol Set

By Herbert E. Hayden

[The construction of the 4-tube Antennatrol was described in the January 23 and 30 issues of RADIO WORLD. *The following article gives some trouble-shooting hints.]*

THE tuning of the Antennatrol is quite simple, since both major tuning condensers may be logged, and the position of the antenna tuning condenser is also a certainty, although it is not sharp enough to necessitate logging. Hence, if there is any trouble getting distance reception, be sure that you set the two dialled condensers at the right point, then vary the antenna capacity by slowly rotating the knob actuating that condenser. Also remember that as straight-line frequency condensers are used care must be exercised in tuning in the higher wavelength stations, since the capacity change in the condensers is quite rapid here, as it should be. That is how the equal spacing of stations of equal frequency separation is accomplished.

As was mentioned in the constructional article, the antenna capacity is an uncertainty, even to the person who owns the antenna, so the problem is to get the antenna system so "capacitated" that the tuning condenser in the aerial circuit will cover the wavelength band. It will be assumed that the inductance in the aerial circuit and the capacity, which includes that of the tuning condenser, reach too high a level. An easy solution is to put a fixed condenser in series with the aerial. Normally this would be about .00025 mfd. Try different capacities, so that the antenna tuning condenser's plates are in the same relative position as the plates of the other condensers for a given wavelength. Then you will get down to the lowest receivable wavelength and likewise catch the highest wave. The only exception to be noted is that if you can not get down low enough by turning the antenna knob, then so gauge the antenna tuning condenser, by introducing a smaller series capacity, to have the highest receivable wave represented by the antenna condenser's plates being fully meshed.

As to the increase in selectivity when a series condenser is used, this is attributable directly to the decrease in input into the receiver by virtue of the reduced fundamental. The majority of us have found that distant stations with a low signal level tune sharply. The reason for this is the low signal level. If we received as much power from that distant station as we do from any one local, the tuning for that distant station would become as broad as that for the local. Hence when we reduce the fundamental, less power is received from the

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interfering stations and the degree of selectivity increases.

Sometimes with tuned radio-frequency installations the use of a series aerial condenser results in increased instability of operation and more difficult oscillation control. This is thought to be due to a reduction of the aerial resistance. That idea is incorrect. The reason is again the reduction of the fundamental, and a corresponding reduced absorption action of the aerial with the lower fundamental on the bands within the tuning range of the receiver.

Dial Settings

The only dial that requires very close tuning is that actuating C2. Next comes C, while C1 is more of a volume control. The following are the dial settings obtained for C1 and C2, while C, under certain conditions, will run very close to the same record.

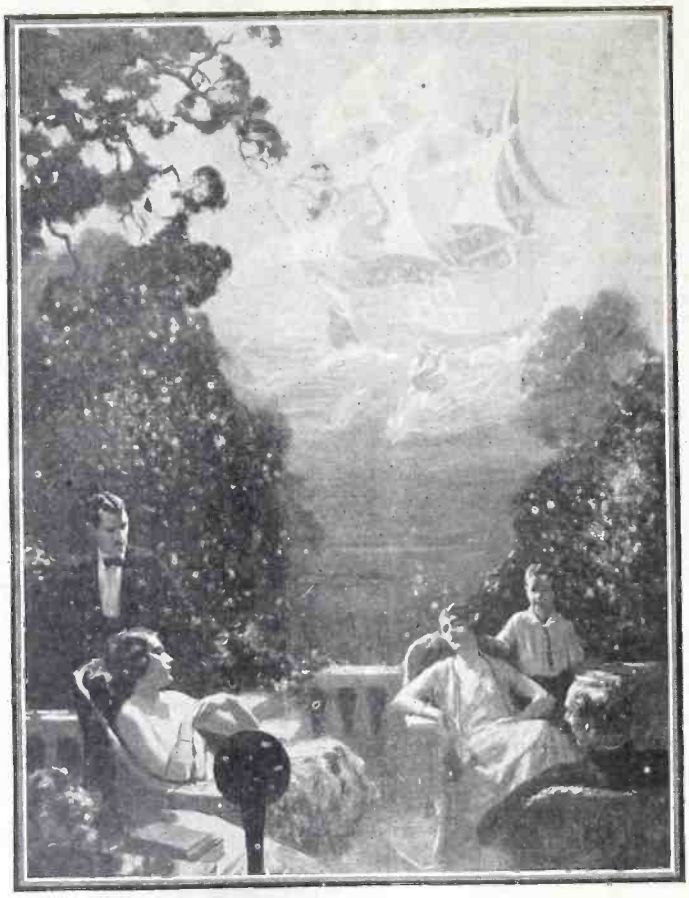
Station	Wavelength	Frequency	Dial CW	Dial CCW
WNYC	526 m	570 kc	8	92
WEAF	492 m	610 kc	13	87
WJZ	455 m	660 kc	18	82
WOR	405 m	740 kc	26	74
WMCA	341 m	880 kc	38	62
WLWL	288 m	1040 kc	48	52
WBPI	263 m	1140 kc	62	38
WGCP	252 m	1190 kc	72	28
WHAP	240 m	1250 kc	75	25

The photographs clearly set forth the layout. A 7x21" panel may be used, and such is shown in the photograph, but 7x24" panel would be all right, too.

Note that two small mounts are advisable, one for supporting the antenna and ground binding posts, the other for mounting the phone tip jacks. Normally these jacks would be smaller than the ones shown, as there is no particular need to insert multiples of speakers.

The baseboard should be deep, e.g., 8½".

A fixed condenser, .001 mfd., across the first audio primary, may prove advisable.



The Eveready Hour

LIKE the fabled ship in which Jason brought home the enchanted fleece of gold, the Eveready Hour brings a rich treasure of entertainment to charm the harbor-homes of its hearers.

Inaugurated two years ago, the Eveready Hour was an adventure in broadcasting—an hour of connected entertainment, uninterrupted by the frequent injection of the name of the broadcaster.

Many of these programs have become famous. Thousands of letters voice the appreciation of our audience and ask for repetition of favorites. We make no requests for these letters, but they mean much to our artists and to us, and are of great value in helping us in our efforts to arrange programs of a distinctive nature and pleasing to the vast audience.

Radio has already become a highly specialized art worthy of the most scrupulous code of ethics, and the Eveready Hour represents a sincere effort to pioneer in providing the most acceptable form of radio entertainment.

Tuesday night means Eveready Hour —9 p.m., Eastern Standard Time, through the following stations—

WEAF–*New York*
WJAR–*Providence*
WEEI–*Boston*
WTAG–*Worcester*
WFI–*Philadelphia*
WGR–*Buffalo*
WCAE–*Pittsburgh*
KSD–*St. Louis*
WSAI–*Cincinnati*
WWJ–*Detroit*
WOC–*Davenport*
WEAR–*Cleveland*
WCCO–*Minneapolis, St. Paul*
WGN–*Chicago*

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