

Why Sets Tune Broadly—A New Theory—Next Week

Everybody's 5¢

RADIO

WEEKLY

IVERSON C. WELLS, Editor and Proprietor

Vol. 3—No. 5

CHICAGO, SATURDAY, OCTOBER 17, 1925

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\$2 BY THE YEAR



This Week

**Two New Kinks in Five-Tube
Makes Real Tuned R. F.
Receiver**

How to Hook Up Batteries

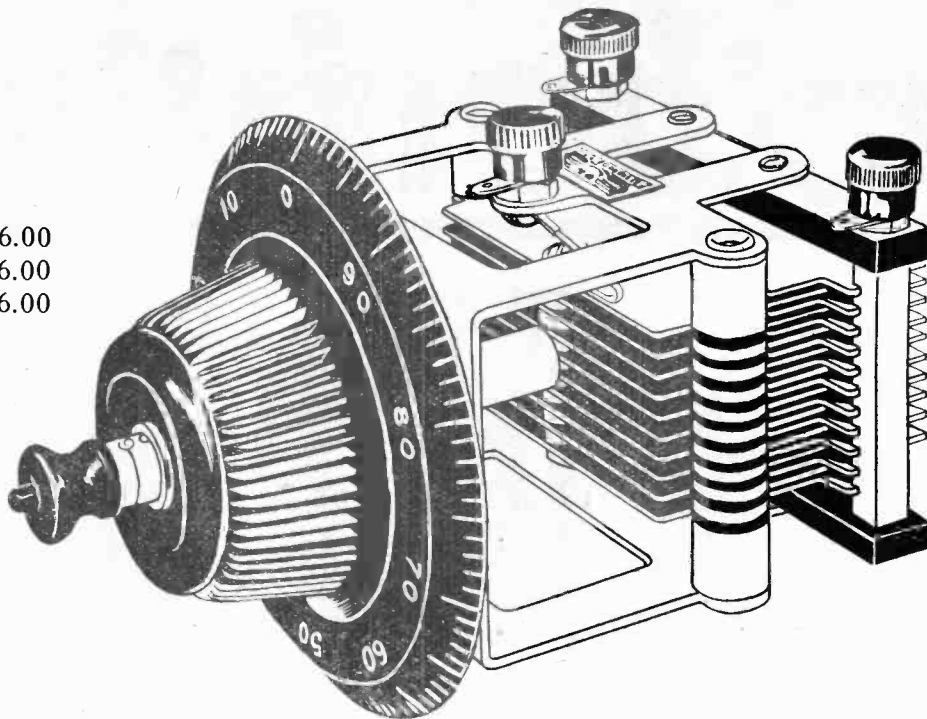
**Twelve Reasons Why Your Set
Tunes Broadly**

**Getting Rid of Noises in
Your Receiver**

PRICES:

Complete with Dial

.0005 mfd.....	\$6.00
.00035 mfd.....	6.00
.00025 mfd.....	6.00

**LOGGING:**

Dial readings can be logged from 0 to 1000. Tunes 20 times sharper than any other condenser.

This Is the Condenser Used in Everybody's Loss-Less Five Tuber De Luxe Model

When Editor Wells was called upon to specify the parts for "Everybody's Loss-Less Five Tuber" De Luxe Model, he selected the BARRETT & PADEN True Straight Line Type Patented Micrometer Adjustment Condenser. He did this because it is a 100% piece of apparatus and belongs in a 100% receiver.

There are many good "low-loss" variable condensers, undoubtedly. Any of these, perhaps, would work

fairly successfully in "Everybody's Loss-Less Five Tuber" De Luxe Receiver so far as LOSSES are concerned, but this sharp-tuning receiver, if it works at its BEST, must have close adjustment on the condenser or stations will be passed by unnoticed. The ordinary verniers won't do. Extra dials and knobs are cumbersome and require special controls to operate. Low-ratio dials makes tuning difficult.

BARRETT & PADEN MICROMETER CONDENSER

Makes Sharp Tuning Easy

There is no condenser made, nor is there any vernier attachment, knob, dial or other contrivance that works with a variable con-

denser that gives one-twentieth the adjustment possible with the BARRETT & PADEN Micrometer Condenser.

Stations that are jammed so close to each other on the dial of the usual condenser that it is impossible to separate them, are pulled

apart twenty times the distance on your dial when you use a BARRETT & PADEN Micrometer.

Fine Adjustment Is Not the Only Feature

The BARRETT & PADEN condenser is a TRUE STRAIGHT LINE type. This is because of the radical construction, which no other condenser uses or can use. There are no rotor plates. The movable plates slide in between the stators, back and forward, with a patented micrometer adjustment. It takes one complete revolution of the dial to move the plates just one graduation! This means that stations separated only by a fraction of a degree on the dial of an ordinary condenser are separated on the Barrett & Paden by TWENTY times that distance.

With the congestion to be found on the usual 180 degree dial rotation of the ordinary type condenser, ten or fifteen stations may be hidden behind a hairline mark and are never heard of by you, but are stretched out until several degrees on the dial separate them—when you use a BARRETT & PADEN condenser. The Barrett & Paden Condenser is a REAL Low-Loss condenser. Prof. Wilcox, of Armour Institute, says of it: "The dielectric losses were found to be so small that no definite value of resistance could be determined." When you take a Barrett & Paden Condenser

in your hands you readily see why. You also note instantly that it is one of the finest pieces of mechanism you ever saw. And yet, while a real PRECISION instrument, it is sturdy. Even the movable plates are supported at THREE points instead of at one place, as with the usual type that has rotating plates. When you hook up the Loss-Less Set, use the Barrett & Paden Condenser. When you hook up any circuit, use it. It will improve the efficiency of any circuit fifty per cent. Buy them at your dealer's. It means radio happiness.

Don't Accept a Substitute

Most every worth-while dealer stocks BARRETT & PADEN Condensers. If yours doesn't, it won't take him but an hour or so to get what you want. Better WAIT and get just what you WANT and SHOULD have. Don't take chances with "Everybody's Loss-Less Five-Tuber" De Luxe Receiver by accepting any sort of a substitute for your condenser, however good the substitute may SEEM to be.

If you have difficulty in getting BARRETT & PADEN Condensers, phone us and we will see that your wants are supplied promptly by telling where your nearest dealer is located.

Dealers:

Most jobbers stock these REAL condensers. If yours doesn't, let us know and we will see that you get what you want.

JOBBERS

BURNS ELECTRICAL WORKS,
Schenectady, N. Y.
CLEVELAND PRODUCTS CO.,
Cleveland, Ohio
DELANCEY-FELCH CO.,
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Worcester, Mass.
HARRISBURG ELECTRIC SUPPLY CO.,
Harrisburg, Pa.
JOHNSON ELECTRIC CO.,
Utica, Ind.

BARRETT & PADEN

Manufacturers
1314 Sedgwick St.
CHICAGO

Jobbers:

If you do not handle the BARRETT & PADEN Micrometer Condenser, phone us at once and we will submit our proposition promptly.

JOBBERS

MOUNTAIN ELEC. SUPPLY CO.,
Pittsfield, Mass.
NORTHEASTERN RADIO CO.,
Boston, Mass.
F. D. PITTS CO., Inc.,
Boston, Mass.
RICE & MILLER,
Bangor, Me.
ROBERTS TOLEDO CO.,
Toledo, Ohio
JOSEPH STRAUSS CO.,
Buffalo, N. Y.

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Everybody's 5¢ RADIO

IVERSON C. WELLS, Editor

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JAMES GRAYAR WELLS
Technical Advisor

Vol. 3—No. 5

CHICAGO, SATURDAY, OCTOBER 17, 1925

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IVERSON C. WELLS

An Open Letter to Mr. Hoover

An Editorial of Logic and Timeliness

MR. HOOVER has called the Fourth Annual General Radio Conference at Washington. It meets November 9. It will be in session three days. Representative men in all branches of the industry have been invited as in former years. The regulation of radiocast stations, largely, is to be discussed.

Who shall be allowed radiocast license, what wavelengths shall they be given, when shall they radiocast and all the other problems that concern this general subject is important, of course. They should be discussed and some way out of the confusion, the chaos and the congestion that is upon us, ought to be arrived at.

However, these problems, while important and while urgent, are not all that confront the radiophans of the Nation. There is one that more than likely even will not be mentioned, least of all, given remedial treatment. It's the STABILIZATION of the industry. This is a subject that is immensely vital. It is just as important as is the control of the radiocast stations. Perhaps the average phan feels it is more important, because it hits his pocketbook.

Mr. Hoover may argue that neither he or his conference has any power or authority to tackle such a subject. The same thing may be said of the subject which he has called his conference to discuss. Mr. Hoover is without authority in that matter, too. Congress has never passed any law that controls, regulates or justifies radiocast stations.

The only power invested in Mr. Hoover is the Co-operative Spirit of the men that have influence in the industry. A gentlemen's agreement may be entered into. That's all. By mutual consent, all parties concerned will abide by the unwritten laws of this conference. That's the way things have been run for the past four years. That's the way things will have to run until Congress gets a little time from the graft game at the National Capital to attend the people's business.

The same unwritten law can be applied to other problems in the industry. There won't be a man at the Washington conference that doesn't realize and will not admit that something should be done in the way of stabilizing the industry. Standardization of parts and apparatus can be had and should be had. We've got too many unsorted sizes and bastard measurements in the radio busi-

ness. There is half a dozen different sizes for condenser shafts and dials. There are one-hole mounts, two-hole mounts, three-hole mounts and there are no mounts at all.

Among those that will be present at the Radio Conference will be members of the Radio Manufacturers' Association. This organization has a constructive platform. This platform stands for just the things that the industry needs and should have. Mr. Hoover can consult with the representatives of this organization on the stabilization of the industry. He can get the views of the other representative men in the industry. Then he should ask all of them to do just what he is going to ask all of them to do in regards to the radiocast station and program problems—and that is, to see that a mutual agreement shall be made an unwritten law and then trust the radiophans of the country to make it effective, just as he trusts the operator of stations to make the other unwritten laws effective.

This publication has proven how EASY it is to run the gyp manufacturer to cover. Before EVERYBODY'S RADIO Weekly started its campaign of Quality in the Chicago territory one year ago this community was overrun with gyp apparatus. Fly-by-night makers were flooding the market with the rankest sort of stuff. In a few brief months this class of merchandise sneaked out the back doors and sought other more promising fields to conquer.

How did we do it? Simple. We shut our advertising and editorial columns to everything but QUALITY. We refused to specify and to advertise any and everything that did not come up to a specified standard of efficiency. And we let the buying public KNOW what we have done and WHY. It didn't take long to nip the tentacles of the gyp octopus here in Chicago. Chicago today is looked upon as the Center of Quality merchandise.

If this same plan were made UNIVERSAL, either the gyp will turn to honest manufacture or quit the industry. We are going to carry our banner into the national field this Fall and Winter. We will do a big bit in the way of reformation everywhere, but we can't do it all. If other radio publications will join forces with us, it will hasten the good day. If Mr. Hoover and his conferees will take up the cudgel the problem will be solved before snow flies. It's up to Mr. Hoover.

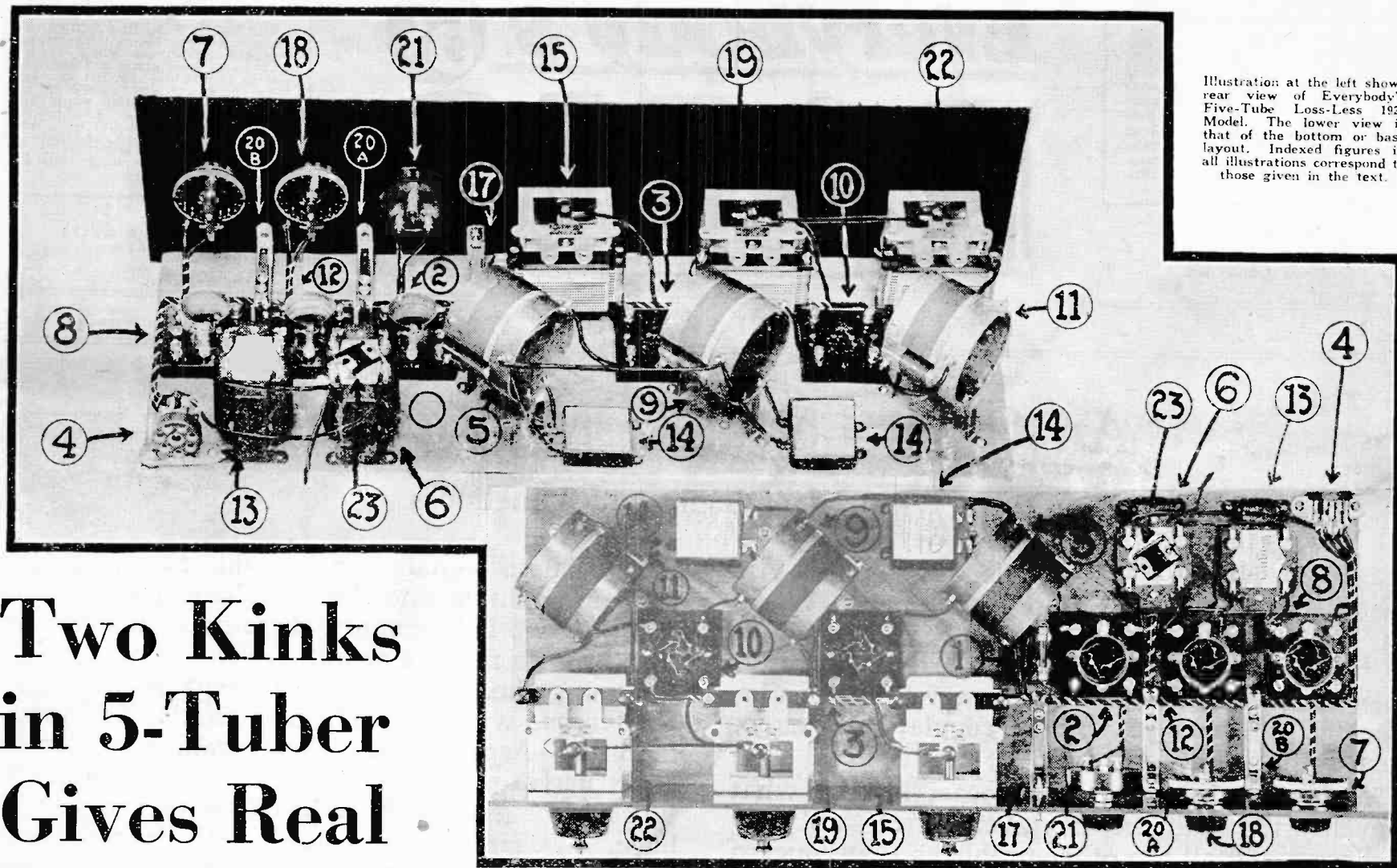


Illustration at the left shows rear view of Everybody's Five-Tube Loss-Less 1926 Model. The lower view is that of the bottom or base layout. Indexed figures in all illustrations correspond to those given in the text.

Two Kinks in 5-Tuber Gives Real Tuned R. F.

New 1926 Model Offered as Last Word in Multi-Stager

By IVERSON C. WELLS

ON THIS and succeeding pages we are offering our De Luxe Model of "Everybody's Five-Tube Loss-Less" receiver for 1926. In presenting this same receiver last year we said it was just about the last word in tuned radio frequency hookups. There has been nothing to come along that makes us want to change that opinion. We are sticking by the same hookup this year and, until something else in the way of a multi-tube receiver is offered the radio world, we will continue to recommend it to our readers as the very best buy.

There are two improvements in the 1926 model, however, that make the new offering a better one than last year. These are not in the circuit, but in the construction. One has to do with the manner of wiring. The other with the way the by-pass condensers are placed. Both are designed to handle stray radio currents and keep them where they belong.

I honestly believe that both of these items are the biggest contribution to radio so far announced this season. I say this, too, after I have given full consideration to the numerous offerings of the manufacturers of tuned radio frequency outfits. Notwithstanding that the general magazines and the popular radio journals are filled with the extravagant claims for "new circuits" and "startling, revolutionary hookups," the radio shows disclosed nothing that hasn't been known ever since tuned radio came into being.

When most of the so-called "new circuits" are analyzed we find some of the old trick circuits of several years ago have been dug out of the ash can, polished up a little here and there and, with a few false whiskers, shoved onto the unsuspecting radio public.

Most of them run to the old absorption circuits. There are more than half a dozen different methods that were employed years ago in an effort to keep the radio frequency tubes from oscillating. These have been revamped and disguised, more or less cleverly, with a well-designed coil, or resistance or some other plan of "stabilizing," and given the usual publicity.

All of these methods accomplish their purposes to a greater or less degree, but lose so much in other directions that the gain is over-shadowed by the losses. For instance, several of the so-called "new" circuits use a small absorption coil wound in the secondary coil of the radio frequency transformers. This coil has no electrical connection to the other coil, but is inductively coupled to it. Usually a high resistance is shunted across this coil. This is the old McAy heatloss circuit that old-timers will recall.

This stabilization method certainly keeps the radio tubes from oscillating, as long as the tubes keep within the scope of its stabilization field. However, the resistance thrown into the secondary circuit is so great and the coils tune so broadly the set is of no value anywhere except in a rural community or a city where interference from local stations is at a minimum.

All these old circuits were discarded years ago because it was found, by actual practice, that radio frequency amplification has to be handled "straight" and without any RESISTANCE. And, yet a radio frequency tube must not oscillate. If it does it chokes up, becomes paralyzed and is useless. The potentiometer, if you recall, was used for a while to control the oscillations. It was known that this device created losses that were fatal to efficient operation, but it was about all that we had, at that time, to make the radio frequency end operate. Tuned radio frequency, therefore, was not popular.

Then along came Hazeltine with his neutrodyne idea. As long as radiocast stations were few and far between this circuit served well. Tuned radio frequency came into its own. Over night five-tube sets were household words. And this popularity has continued, although the neutrodyne has been forced to take a back seat with the appearance of a dozen or more radiocast stations in every city. It still is efficient enough in the rural communities and will continue to serve those sections for a long time to come. But, in a city like Chicago, with nearly thirty high-powered stations pounding the air, it is next to useless. It is too broad in tuning.

Mr. Hazeltine did one good thing for us, however. He taught us what interstage coupling between coils was and how to get away from it. With the knowledge that coils could be so located in a set as to keep from stepping on each other's toes, the rest of the way has been easy. Phanstiel was one of the earliest to take advantage of this suggestion on the part of Hazeltine. Wells Junior, who is guiding the destinies of EVERYBODY'S RADIO Weekly technical department, probably would dispute priority of effort along this line.

Nevertheless, whoever, pioneered the way, the fact remains that radio frequency can be tamed and without losses. "Everybody's Five-Tube Loss-Less" circuit, as we have it today, came forth from our own unpretentious laboratory of more than three years ago. It recognized the advantage of nullifying the interstage coupling, but the backbone of the circuit was in the control of the radio tubes through the RHEOSTAT.

If there is no interstage coupling between coils and strays are kept where they belong, the only way a radio tube can be made to oscillate is to turn up the FILAMENT current too high. We know that is true from the regenerative sets where the detector tube will be thrown into nine cat fits if we turn the filament current on too strong.

There is just one drawback to this method of control. While there are no losses and, therefore, full volume and good distance can be had, plus real selectivity, there is a tendency, if the entire construction program is not carefully thought out, for the rheostat to be CRITICAL. In an improperly constructed set of this type one is very likely to have his rheostat make the radio tubes act very much like the old "soft" detector tubes use to perform in

the regenerative hookups. They will plop into oscillation with the slightest movement of the rheostat.

This tendency is due to the fact that radio frequency current leaves its conductor wires and strays about the set into places where it does not belong. The "B" plus leads usually are the source of trouble. If we permit any radio current to get into these leads we can expect trouble and a "B" plus wire needs only to run close by a radio current wire to pick up the offending current.

One of the ways of keeping control of these oscillations is to place a vernier control on the tubes. This is done by employing a high resistance in the plate circuit of the tubes. We still regulate the filament current with the rheostat, but by using this plate resistance we bring about a more stabilized condition, the "B" plus on the plate being under control from zero voltage to the limit of the battery.

In the model set shown this week we have inserted one of these plate resistances. In this case it is a "CRL" resistance. A "Clarostat" also will serve the same purpose as will any similar resistance. A "Bradleyohm" is not quite strong enough. This treatment is particularly advised for those who already have built a "Low-Loss" and who find that the rheostat adjustment is too critical.

Frankly, we folks back here at radio headquarters like to get at the source of the trouble and remove it. It is well enough, for the sake of an immediate or emergency relief, to place a soothing poultice on a painful boil. The obvious thing to do, however, is to lance the boil and then find out what is in the system that is causing the boils and get rid of it.

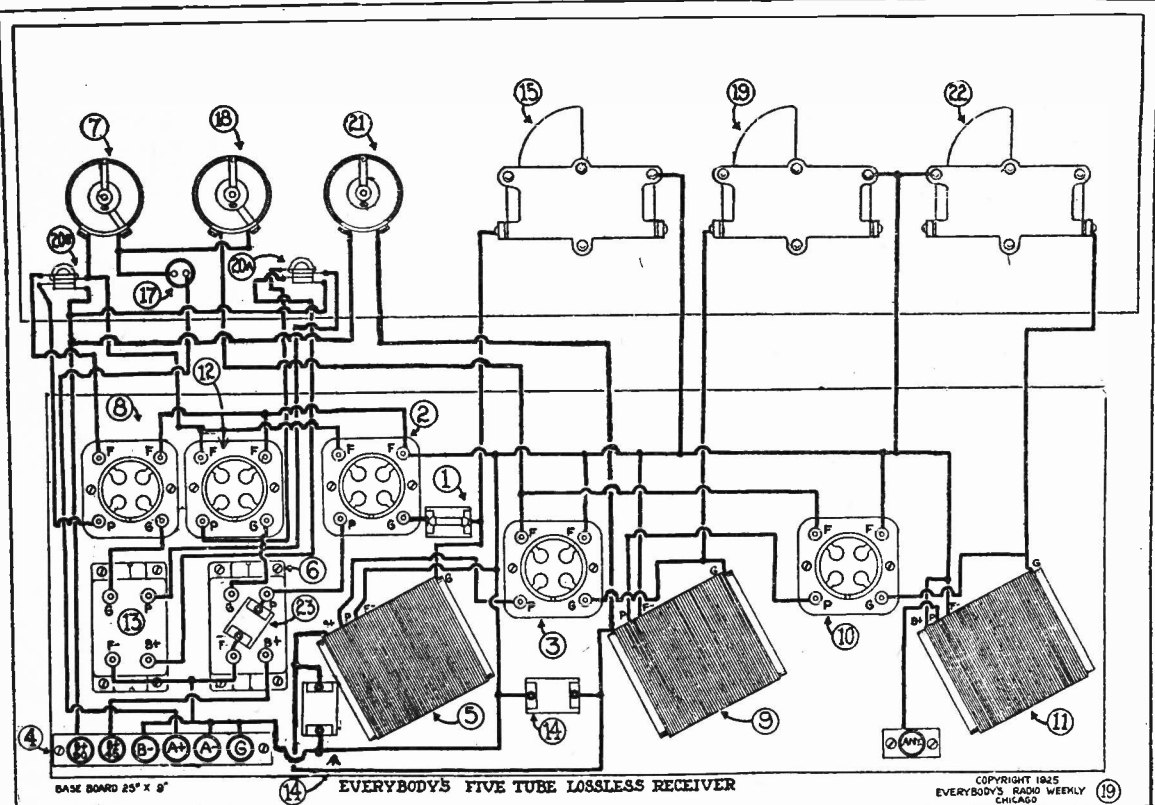
And this brings us to our two real IMPROVEMENTS in this year's model of "Everybody's Five-Tube Loss-Less" receiver. By proper wiring we keep the "B" plus battery leads AWAY from the radio leads. This result is achieved by CABLING all the battery leads. In other words, we run all the battery leads together, keep them all at GROUND potential, and then set them FAR AWAY from the radio wires.

By making it very difficult for the radio current to leave its conductors we can direct it where it will do the most good—in the coils, and the rest of the circuit where it belongs. If you will notice the accompanying illustrations you will find there is a wide separation of the battery leads and radio current leads.

We have taken one more precaution in this respect. It is in by-passing whatever stray radio currents that persist in leaping from the radio leads however careful we may be. We do this by shunting a fixed condenser of say about .1 mfd. across the two "B" battery terminals. Now, this idea isn't a new one, of course. Advanced radio experimenters have been doing this for some little while. However, they did this either at the battery terminals themselves or else at the battery binding posts in the rear of the set.

Our suggestion is to stop these currents right at the fountain head, which is the radio frequency coils themselves. You will note in the accompanying illustrations that we have the condensers directly across the terminals of the coils. They are shunted across the "B" plus and "A" negative leads to the coil. This is the same as placing them across the "B" plus and the "B" negative, since in this hookup we connect the "B" negative and the "A"

"It Isn't Everybody That Can Advertise in EVERYBODY'S."



This is the Pictorial diagram of Everybody's Five-Tube Loss-Less Receiver 1926 Model. The schematic diagram, if you prefer it, is at bottom of this page.

negative together elsewhere in the circuit and run both to a common ground.

By analyzing the circuit you will note that with the condenser in these positions there is little chance for strays to get tangled up with the radio later where it would cause trouble.

It is these two kinks in wiring—the cabling of the battery leads, with all battery wires on a common ground potential, and separated widely from the radio leads, and in the placing of the by-pass condensers close to the coil terminals, we believe we have given a real contribution to the radiophans this season.

In next week's issue we expect to give full construction details of this week's model, laying particular emphasis on the cabling and general wiring scheme.

Now, a few words about the apparatus in this week's model. We have striven to give you an exceptionally good combination of parts because this particular model being a first-edition set-up for the season, will be given preference by many of our readers for the rest of the season. I hope you understand, nevertheless, that there are other combinations of parts that will work equally as efficient and that it is our purpose, from time to time in the coming weeks, to illustrate these combinations.

The combination shown in the present model has several very desirable features. Because of the type of coils, condensers and other apparatus employed we have an extremely SELECTIVE set, an exceptionally long distance RANGE and a superb TONE QUALITY. I doubt if there is an eight-tube super heterodyne made that will out-perform this week's model on all of these three points.

Fundamentally the circuit is a selective one. With the cabled job in the battery leads, the smooth and positive control of the natural tendency of the tubes to oscillate, the type of coils we use and the efficient variable condensers employed we have made it even more so. And that is saying a whole lot.

The coils are of the "D" or "Figure 8" type. We have had a lot to say about this type of coils the past year. The ones shown are a manufactured coil—the Ellis "D" coils. We have printed from time to time instructions for winding these coils, and they CAN be wound at home by an experienced home-experimenter, but we do not advise the idea as a general one for our readers. The average phan will get into trouble. He will find it in crossing the windings.

My advice is to buy the Ellis coils. They cost but \$2.50 each, can be had at most radio stores, or will be sent by the manufacturer to you, and are built exactly according to our own formula and will deliver exactly what you expect of them.

There is just one little point Mr. Ellis overlooked in designing these coils that would help their use. He has not placed a mounting arrangement on them. We had some old mounting brackets that were on another coil and you will note we used them in this model set. We like to lift the coils up off the baseboard. These coils come unmounted and while they will not suffer from being laid flat on the board, mounting gives them a better appearance, permits them to be swung around a little, if necessary, and certainly won't hurt their efficiency.

I might insert at this point this one little note. Because of the peculiar winding of these coils there is little or no field to the coils and, therefore, you won't have much trouble from interstate coupling. Also their pickup ability is mighty small. That helps keep down local interference and aids in selectivity.

The variable condensers used are old friends. They are the Barrett & Paden micrometers. We described this condenser last year when it was introduced to the trade for the first time. Most of you old readers need no reference to it, but as we have many recently added readers in the East and the Far West a few words here in its behalf will not be amiss.

The Barrett & Paden is identically as it was last year, with the exception that an improvement in the bearing shaft corrects a little fault in the adjustment of the condenser that was apparent last season. The manufacturers claim perfection for this year's model and we are inclined to almost agree with them, making a mental reservation that we do not feel any condenser made today is absolutely perfect.

This condenser is one of the first of the straight-line frequency condensers, the makers having forecast last year the popular demand. It stood rather alone on that idea at that time, but its makers have the satisfaction of knowing that the straight-line frequency condenser is all the rage this year.

This condenser is of the box type—a decided variation of the usual rotor plate type. It has a true micrometer adjustment and you will find it a decided joy when it comes to tuning. Don't overlook the fact that the large dial is the vernier on

this condenser. You get your coarse adjustment from the small center rod knob. One of the peculiar features about this condenser is that it SEEMS to be tuning broadly when you turn the DIAL. Mind you, I am emphasizing the dial. You'll find the stations "stay in" on the dial for quite a distance and that they pass GRADUALLY "in" and "out." There is no snap to the coming and going as is found in most "sharp" tuning condensers.

Don't let all this fool or mislead you. You can make the stations snap in and out with just as much pep—probably a little more than with the usual rotating type apparatus, if you use the COARSE adjustment, or the small KNOB, which you PULL BACK AND FORWARD.

This seeming "broadness" of the dial is due to the true micrometer adjustment of the dial which works the coarse adjustment shaft with a spiral movement, just as a machinist's micrometer is worked. You have to turn the dial one complete turn to get one degree on the dial! Do you see what THAT means to you in tuning in stations that are close together?

This is true, not only with the low wave length stations but also true for stations in the entire radio casting range, high, medium or low.

Just imagine a straight line drawn with dots close together along its course, some of these dots so close they touch each other. Let each dot represent a station. Now, with an ordinary condenser it is impossible to separate those that actually overlap or which are separated by an infinite small margin.

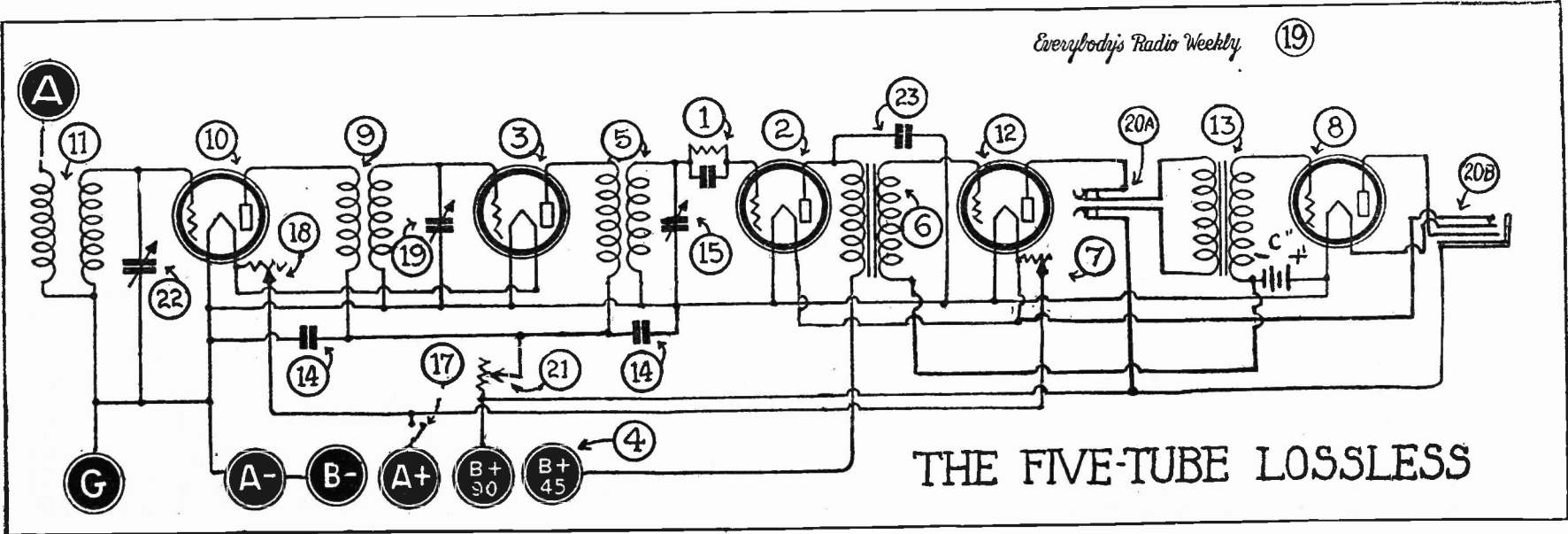
However, with this condenser the dots are separated by TWENTY times the distance found on the usual type condenser! You tune in a station and seek to pass on to another. The station gradually fades out until a silent spot is reached. You continue to turn and turn and gradually another station is heard faintly. This comes in gradually also and it is really difficult to tell just when the full-volume point has been reached. That's the micrometer adjustment.

If you are in a hurry, or you want to hear the familiar "snap" to the signals coming in or going out, just use the coarse adjustment knob. Your easy-tuning condenser instantly becomes the typical sharp tuner. You also pass over many stations without knowing it, which is a mighty good argument for the micrometer adjustment.

Some of the other parts used are the Yaxley new air-cooled rheostats, the new Howard sockets and the new American electric jacks. These jacks are just placed on the market. They are made by the same concern that makes the Burns loud speaker. They are electrically efficient, have good hard metal springs and silver contacts. The entire bill of specifications for parts follows:

Fig. 1—Muter .00025 fixed condenser and 2 meg. gridleak	\$0.65
Fig. 2—Howard socket	1.25
Fig. 3—Howard socket	1.25
Fig. 4—Jones Multiplug	4.50
Fig. 5—Ellis "Dee" coil radio frequency transformer	2.50
Fig. 6—Wagner audio frequency transformer, type "A"	8.00
Fig. 7—Yaxley six-ohm rheostat, air cooled	1.35
Fig. 8—Howard socket	1.25
Fig. 9—Ellis "Dee" coil radio frequency transformer	2.50
Fig. 10—Howard socket	1.25
Fig. 11—Ellis "Dee" coil radio frequency transformer	2.50
Fig. 12—Howard socket	1.25
Fig. 13—Wagner audio frequency transformer, type "A"	8.00
Fig. 14A—Dubilier 1-mfd. by-pass condenser	1.25
Fig. 14B—Dubilier 1-mfd. by-pass condenser	1.25
Fig. 15—Barrett & Paden .00025 variable condenser	6.00
Fig. 16—Adams filament switch	.75
Fig. 17—Yaxley six ohm rheostat, air cooled	1.35
Fig. 18—Yaxley six ohm rheostat, air cooled	1.35
Fig. 19—Barrett & Paden .00025 variable condenser	6.00
Fig. 20A—Yaxley interstage jack, code No. 4	.80
Fig. 20B—Yaxley single circuit filament control jack, code No. 3	.70
Fig. 21—Centralab 2,000,000 ohm resistance	2.00
Fig. 22—Barrett & Paden .00025 variable condenser	6.00
Fig. 23—Muter .002 fixed condenser	.40
Starrett standard panel 26 ins. x 7 ins., model number 19	4.65
Baseboard, wire, hardware, etc.	.75
Total	\$63.15

Next week full construction details will be given on this set. Particular emphasis will be placed on the detailed description of the cabled battery leads.

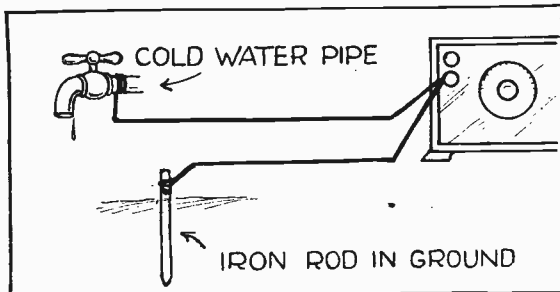


Here Are 12 Reasons Why Your Set Is Not Selective—

Broad-tuning in sets may be traced to more than one possible source of trouble. If a three-circuit regenerative hookup is used, look for the cause here: (1) It may be a reversed tickler lead which keeps set from oscillating. (2) It may be a non-oscillating detector tube. (3) It may be too close coupling between primary and secondary. (4) It may be radio-frequency leads run too close to battery lead or metal parts of condensers, tube or other apparatus. (5) It may be failure to operate tickler coil efficiently. This must be turned in to just below the point of the tube oscillating and "spilling" and held there throughout the tuning of the secondary coil by the variable condenser. (6) It may be too many turns on the primary coil. Eight to twelve turns are sufficient. (7) It may be low batteries. (8) It may be poor ground or aerial connections. If it is a tuned radio-frequency hookup it may be: (1) Too many turns on primary of coils. (2) It may be that the coils are too close to condensers, to each other, to some metal objects, to battery leads. (3) It may be that some sort of resistance has been introduced into the radio-frequency circuit, such as a Bradley-ohm, high-resistance coil, grid leak, balancing or neutralization condensers, improperly wound coils. (4) It may be some of the causes above noted in case of regenerative receivers. You're welcome.

TWO OR MORE GROUNDS BEST

Two or more "ground" connections should be used. At least one of these may be "good." Fasten



on to the cold-water pipe for one end and to a radiator for another. If possible also run direct to the earth, driving a rod into the ground several feet until moist dirt is struck. You're welcome.

USE OF HYDROMETERS

A reliable hydrometer tells you immediately the condition of the "A" battery—whether it is charged or not. The hydrometer is inserted into the vent cap of each cell and the bulb is squeezed and released to draw the electrolyte up into the outer glass cylinder. This causes the small float to rise. The specific gravity of the solution determines how high or low the floating gauge will be in the electrolyte. The float rises to a greater or lesser degree as the solution contains greater or lesser amounts of acid. This gives an accurate indication of the amount of charge in the battery. The "fully charged" reading of the hydrometer for the ordinary lead storage battery is 1.280 and the "fully discharged" reading is about 1.150. Never let your batteries get below 1.175. You're welcome.

OPERATING NEW BATTERY

The first time a battery is put into operation it discharges quite rapidly. A battery rated at fifty ampere hours may give only twenty hours of service on the first charge. This is no cause for worry, however, because a battery does not deliver its full capacity until it has been charged and discharged two or three times. You're welcome.

BIG BATTERIES CHEAPEST

"Large" size "B" batteries are most economical. Their first cost is approximately twice that of the "small" size, but their life is about sixteen times as great. You're welcome.

HANDLING THE RHEOSTAT

The lowest setting of the "Filament" control, or rheostat knob, that will give good results is the most economical. In reception from powerful local stations the setting of this knob may be quite low and still provide plenty of volume on the loudspeaker. You're welcome.

OIL ON CONDENSER BEARING

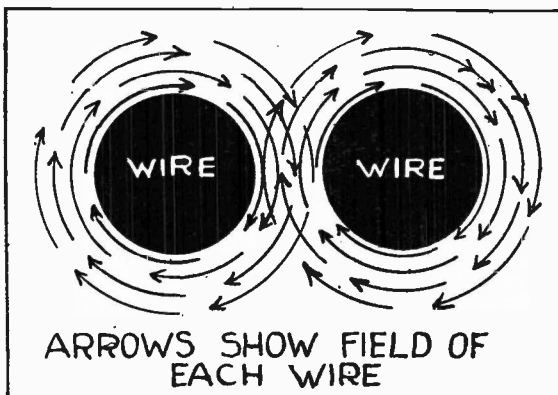
Never use oil on a condenser's bearing if the plates turn hard. Oil is a good conductor. Loosen the pivots or the nuts that hold the bearing, or if you cannot do this and can't find someone that can do it for you, throw away the condenser. You're welcome.

WHAT AUDIO MEANS

The term audio-frequency applied to radio and engineering in general means the frequency of alternating currents, which can be used to produce audible tones in telephone receivers. The audible range of sound of the human ear is approximately between sixteen cycles and 20,000 cycles. Some people's ears exceed these limits and still other ears are limited to a smaller frequency. Currents, therefore, which range in frequency between the two limits stated, are generally called audio-frequency currents. Radio-frequency currents oscillate much faster than the highest audio-frequency currents. As used in radiotelephony and radiotelegraphy, these currents range between 30,000 cycles and 5,000,000 cycles. Currents, therefore, below 20,000 cycles are termed audio-frequency currents. Currents above this value are termed radio-frequency currents. You're welcome.

ALL WIRES HAVE A FIELD

Any current-carrying wire is enclosed in a magnetic field. This field travels along the wire in spiral



fashion to the left or to the right. This depends upon the direction of the current flow. The extent or circumference of the spirals is dependent upon the strength of the current. All of which explains why it is necessary to keep wires separated in construction work. You're welcome.

STRANDED WIRE FOR HOOKUPS

Rubber-covered stranded wire (No. 18) is best for hookup purposes. It permits direct leads, saving several feet of wire in the construction of a set, which means reduced resistance. It keeps leads further apart. It makes a neater job. It insures against accidents to tubes when a screwdriver is dropped into set. This magazine introduced this type of wiring to its readers last year, when fancy-angle bus bar was all the rage. All our model sets are hooked up with it. Most manufactured sets use this kind of wire this year. Bus-bar wire is obsolete. You're welcome.

DIALS THAT BIND

Often the dials on a home-made radio receiver will turn in anything but a smooth fashion simply because the hub of the dial is rubbing against the edges of the shaft hole. In mounting dials of the ordinary type it is well to slip a piece of paper under the dial before you tighten up the set screw. Then you can remove the paper with the assurance that there is sufficient clearance between the hub of the dial and the surface of the panel. Some of the dials which can be mounted without a set screw have a tendency to move toward the panel when the clamping nut is tightened. With such dials it is desirable to use three thicknesses of paper. You're welcome.

METHOD TO CALIBRATE WAVEMETER

A simple method of calibrating a wavemeter is to take two points—obtained in the usual manner—and plot them on a piece of logarithmic scales cross-section paper, plotting wavelength against dial divisions. A straight line thru these points will give a curve from which the wavelength can easily be read for any condenser setting, providing the condenser is of the straight capacity line type. The idea is absolutely no good unless the plates of the condenser are of the shape mentioned. The accuracy of this method should be sufficient for the transmitting amateur, although it has not been tried at the shorter wavelengths. However, it will be of value in determining the approximate positions of the harmonics if calibrating by the old method, thus reducing the possibility of getting them mixed up. A good paper for this work is that of the Eugene Dietzgen Company—No. 378A, five-inch base; No. 378B, ten-inch base. The condenser dial should have one hundred divisions in order to facilitate the plotting.

REDUCING CONDENSER RESISTANCE

The solution of the problem of reducing condenser plate resistance seems to be in silver-plating the rotary and stationary plate assemblies as whole units, not coating the plates separately. If a condenser which is good mechanically is given a good coating of silver in this way, it will be almost as good as if the units were cast in one piece.

How to Get Rid of the Noises in Set with Solder Iron

Noisy sets sometimes are caused by careless soldering. This particularly is true on the loudspeaker or phone jack terminals. Use soldering paste and rosin sparingly. Special care should be taken where connections are close to each other such as in jacks, tube-socket and transformer. If too much paste is used it will melt and spread over the surface. This produces a fairly good "leak" and seriously reduces the volume on distant signals. The insulation of a telephone jack soaks up the melted flux very readily. Rosin core solder is the best to use. Never use acid core solder under any circumstances in radio.

DISCONNECT WIRES AT BATTERIES FIRST

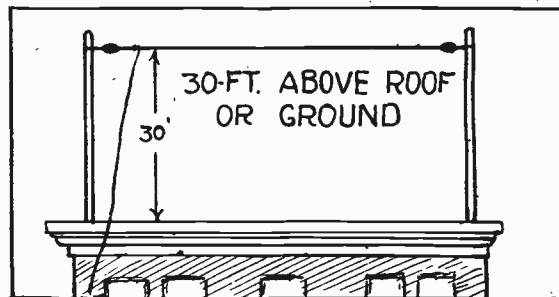
If you have occasion to change the location of your receiver, be sure to disconnect the battery wires from the batteries before you loosen up the binding posts on the receiver. You're welcome.

NOISES IN RHEOSTATS

Clean your rheostats frequently by rubbing the contact arm and the shaft contacts. These often become dirty and cause the crackling and sizzling noises often ascribed to tube noises and batteries.

WHAT AERIAL HEIGHT MEANS

Installing an aerial wire close to the earth or grounded objects increases the capacity of the aerial



and increases the natural wavelength of the aerial. An aerial 100 feet in length is sharper tuning, naturally, thirty feet from all grounded objects, than one only eight or ten feet away. You're welcome.

TO TEST FOR OSCILLATIONS

A tube or set that will not oscillate when forced is not working efficiently. Few know how to test except by the howls and squeals that emanate from a tube, and this not always is a safe test to follow. Dampen the tip of a finger and touch the grid terminal post of a tube or condenser. If there is a decided click the set will oscillate. You're welcome.

WAVE TRAPS ARE BAD SIGN

Wave traps are the sign of an improperly constructed receiving set. Any receiving set can be made so selective. Instead of spending time, effort and money building wave traps, put the same time, effort and money into remodeling the receiver. You're welcome.

KEEP JACK CONTACTS CLEAN

Although the contacts of all high-grade phone jacks are made of silver, which has a high degree of conductivity, dust or dirt may possibly get in between the metal surfaces. The result will be sizzling and frying noises in the headphones or loudspeaker. The simplest way to clean jack contacts is to let them close on a piece of fine sandpaper and then pull the sandpaper out. Repeat this process with the sandpaper turned over and you will then be sure that both contacts are clean. Do not use emery paper, because emery powder is conductive and may partially short-circuit the jack. You're welcome.

ENGRAVING YOUR OWN PANELS

There is a small pattern, made of brass, nickel-plated, sold at the stores, which enables anyone to engrave arrows, circles and other similar symbols on a rubber or bakelite panel. The patterns are cut into the metal and are used as a guide for a sharp tool which scratches the desired symbol in the panel. The graven lines are filled in with Chinese white. You're welcome.

Here's How to Connect Up Batteries

You've Puzzled Over the Job, So Stick This in Your Scrap Book

CONNECTING batteries is confusing to some phans, particularly the "Series" and "Parallel" methods. To connect two or more batteries in parallel, connect the negative post of one to the negative post of the next, connect the positive post of one to the positive post of the next, see illustration (Fig. 1).

To connect two or more batteries in series connect the positive post of one to the negative post of the next and connect the negative post of the first to the positive post of the next. See Fig. 3. This applies to any kind of battery.

Overloading a dry cell battery is more wasteful than underloading it. You overload a dry cell by drawing too heavy currents from it. Never exceed one-quarter ampere per cell.

Figure 1 shows how to connect two one and one-half volt dry cell "A" batteries in parallel for using one or two WD-11 or WD-12 tubes, making an output of one and one-half volts, the required number for these tubes. Fig. 2 shows how to connect four of these dry cells in parallel when using three or four WD-11 or WD-12 tubes. The total output of these four battery dry cells is one and one-half volts. For every additional tube, over four, add another dry cell for each tube.

The WD-11 or WD-12 tubes require, approximately, one-quarter of an ampere for normal operation. In order to force the one-quarter ampere through the filament a voltage pressure of 1.1 volts is required. The voltage of a new dry cell is about one and one-half volts. This difference in voltage is absorbed by the rheostat placed between the battery and the tube. As more and more current is removed from the cell, its voltage approaches 1.1 volts so that less and less of the rheostat resistance is required. A six-ohm rheostat should be used with these tubes.

Figure 3 shows how to connect three dry cells for use of from one to three UV-199 or C-299 tube. Three volts are required for the UV-199 tube, but although the voltage of two new dry cells connected in series is three volts, the voltage drops slightly from them the instant the current is drawn from them, so that less than operating voltage is available for the UV-199 tube. In order to insure having three volts at the terminals of the tube, it is, therefore, necessary to connect three dry cells in series as shown. This gives a total output of four and one-half volts. The difference between this voltage and that required for the tube must be absorbed by the rheostat placed between the tube and the battery. Due to the small current used by the UV-199 tube, a resistance of at least thirty ohms must be employed.

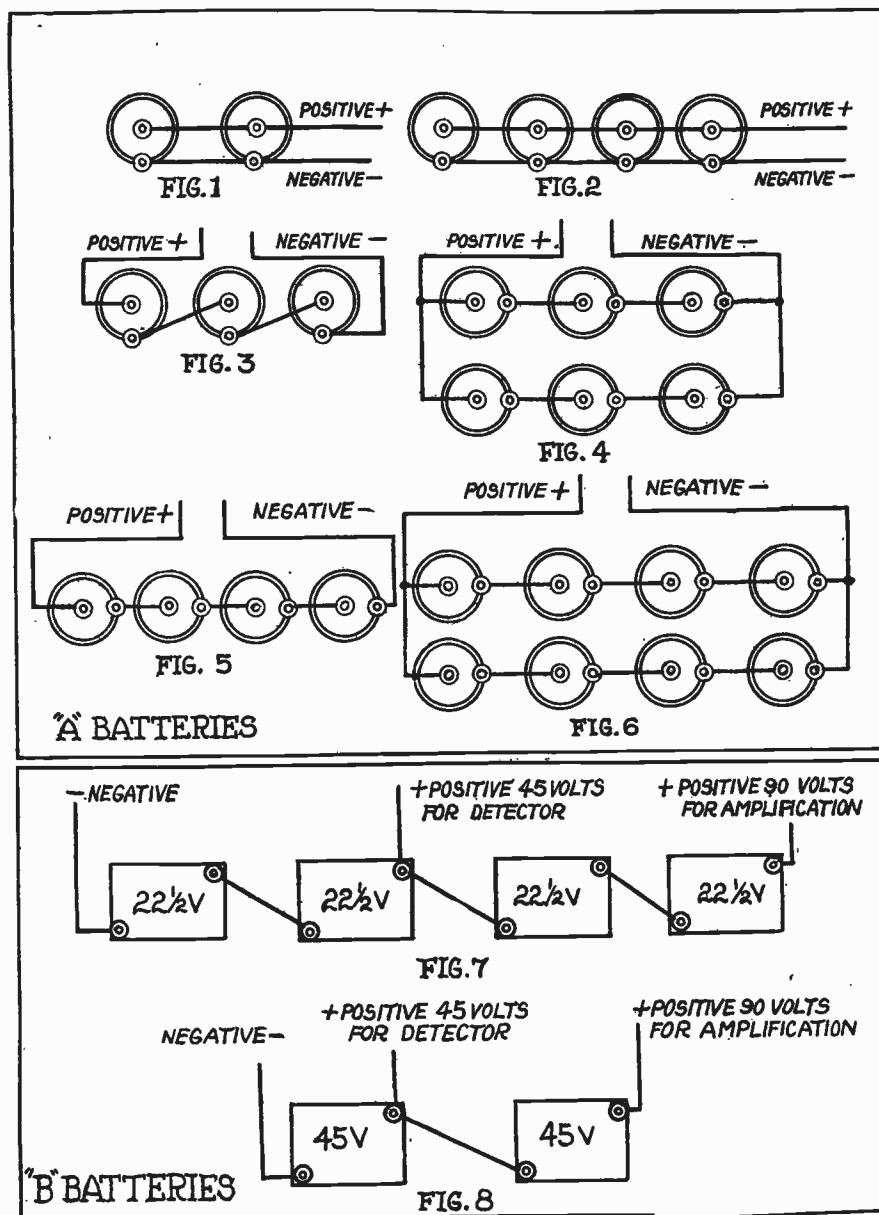
Figure 4 shows how to connect six dry cells for use within a receiver using more than four or more UV-199 tubes. A group of three extra dry cells are connected in parallel with the first group, as shown in Figure 3.

Figure 5 shows how to connect four dry cells in series making an output of six volts. UV-201A tubes require five volts. Therefore, allowing for the resistance which will cut down the voltage, five volts are used. Figure 6 shows how to connect three more dry cells in parallel with the three in Figure 5. However, it is advisable to use a wet storage battery on sets using UV-201A tubes as dry cells are more expensive on account of being renewed so often.

Figure 7 shows how to connect four twenty-two and one-half volt "B" batteries in series making an output of ninety volts. The forty-five volt tap for the detector is taken off the plus post of the second battery. Figure 8 shows two forty-five volt "B" batteries connected in series giving an output of ninety volts for amplification. In this case the forty-five volt or detector tap is taken from the plus post of the first battery.

WATCH YOUR SOLDERING

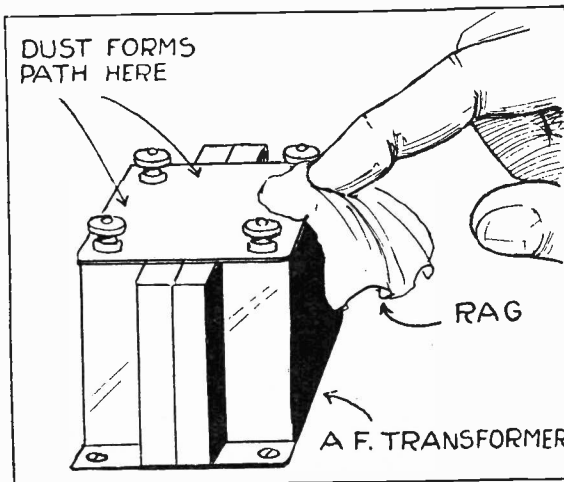
It is often noticed that the soldering iron is not hot enough to melt the solder and flow it in a smooth joint. It is necessary to have the joint as hot as the iron and the solder to do this. The iron tip should be kept hot when soldering. A sticky, pasty mess is the result of NOT doing this and the subsequent contact is poor and troubles cannot be located, due to the appearance of solder. Remember also that if stranded wire is used all the strands should be soldered. Unsoldered strands will cause a resistance in the circuit.



If you will study the above illustrations and refer to the text in the first column of this page you will learn how to connect up your batteries to get the various combinations. This is a mighty handy chart to paste in your scrap book. This diagram was published in these pages last winter, but so many inquiries have been made of late it is given again

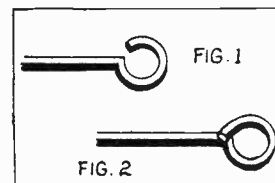
DUST REDUCES VOLUME

Often a set owner reports that a set, after a few months of efficient operation, for no reason (apparently) begins to lose volume and tone quality. New batteries and new tubes are tried out without success, and oftentimes good money is paid to some inefficient set builder or trouble shooter, but all without any profit. Usually a good cleaning of all the apparatus is sufficient to correct the trouble. Dust makes a good leakage path for radio-frequency



currents especially. It is composed of carbon from a city's coal smoke, of oils and greases and of finely powdered minerals and metals. These materials are conductors and when deposited on a radio-frequency or audio-transformer between two terminals, or a tube socket, or on any other apparatus in a set, a veritable "grid leak" functions to carry the radio-currents where they do not belong, thus causing losses in signal strength. Saturate a clean cloth in alcohol and clean off all apparatus thoroughly, particularly between binding posts and terminals. Then put the set in a dust-proof cabinet or box and KEEP it there. You're welcome.

PROPER WAY TO LOOP WIRE



No. 2 shows the wrong way. If the loop is crossed over as shown in Figure No. 2, the tendency would be to cut the wire in half as soon as any pressure is applied to the nut. You're welcome.

TUNING "EVERYBODY'S LOSSLESS"

The radio-frequency rheostat is the critical tuning control on "Everybody's Five-Tube Lossless" set. It must be moved forward as you advance the condenser plate of the three variable condensers. Keep the tubes just below the point of oscillations. It is at that spot, and it is on a hair-line, that real volume and selectivity are found. You're welcome.

MAKES DISTANCE BETTER

Keep battery leads AWAY from the radio-frequency leads in all hookups. This particularly applies to tuned radio-frequency sets. Also keep the plate and grid leads of all coils and tubes widely separated. It means more volume, greater distance and far greater selectivity. You're welcome.

KEEP SOCKETS SEPARATED

The separation of tube sockets and the separation of the plate and grid leads in a set will go far towards the reduction of tube capacity and the consequent sub-oscillation that is so ruinous to tuned radio-frequency receivers. You're welcome.

HOW TO IMPROVE LOUDSPEAKER

To take the tinny sound out of a loudspeaker with a metal horn, spatter it slowly with a mixture of hot paraffin and salt to which a little vinegar has been added to make it adhesive. When the coating cools, apply several coats of flat, black paint. You're welcome.



Burns SPEAKER with CONCERT UNIT

Distinctive and pleasing in design. Remarkable volume with exactness of reproduction. Adds to the enjoyment of any receiving set. Made up with flare of horn in several handsome finishes.

THE HEART OF THE SPEAKER

The large size and scientific construction of the Concert Unit gives the remarkable tone values which combined with the special amplifying properties of the Burns Horn produce the wonderful results obtained.

LIST PRICES

No. 205B	With black flare.....	\$22.50
No. 205D	Mahogany tinted flare.....	25.00
No. 205P	Mother-of-Pearl flare.....	30.00
No. 100	Phonograph Unit.....	10.00
No. 120	Concert Unit.....	12.00

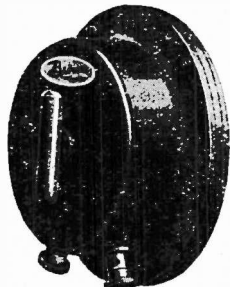
At Your Dealer's or Direct

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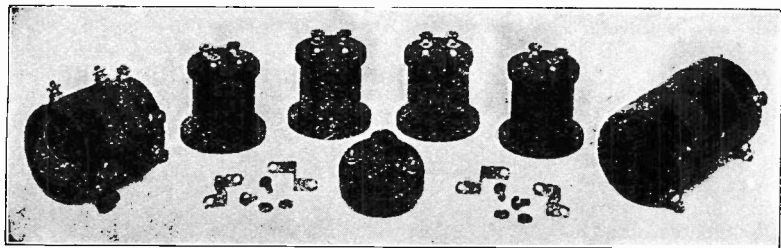
CHICAGO, U. S. A.



CONCERT UNIT

A New SUPER-HET KIT \$17.50

With Perfectly Matched Transformers and Filter



This is a SUPERADIO Product—Your Guarantee of Satisfaction! A most selective, a most powerful, a long ranged, a fine toned 8-tube super. Intermediate transformers matched to identical peaks and filter tuned to same peak. Kit includes Antenna Coupler, Oscillator Coupler, Special Variable Condenser, Tuned Input Transformer, 3 matched intermediate transformers and hardware. Complete with booklet, diagrams and full sized working drawings which positively assure perfect success. Order now. Only \$17.50.

SAVE MONEY ON THIS COMPLETE OUTFIT

Every Kit Made Up of Individually Tested Parts, as Follows:

Superadio Inductance and Transformer Kit, 2 Heath Radiant Condensers, 2 Keystone Audio Transformers, 8 Pioneer Genuine Bakelite Sockets, 2 Yaxley or Carter Rheostats, 1 Potentiometer, all necessary fixed condensers, 2 "Megit" Grid Leaks, 1 Mounted Binding Post Board, 1 Base Board, 1 Drilled Panel, 2 "Dialog" Vernier Dials, 3 Yaxley or Carter Jacks, 1 Yaxley or Carter Filament Switch, Soldering Lugs, Bus wire and wood screws, diagram and instructions.

\$73.50

5-TUBE MONARCH OF THE AIR

SUPER-SELECTIVE TUNED RF

With Dialog Vernier Dials and Other World's Finest Quality Parts

When assembled, this receiver will equal the performance of any other 5 tube set ever devised. Now, greater efficiency obtained through unique circuit and through use of only such parts as match laboratory standards. Never before has a kit of such high quality parts been made up for a 5 tube set. Each part in each kit individually tested. Uses either 5 tubes or 4 tubes and Welty's Crystector—which kills static. Working drawings and full instructions. Order now. Kit price.....

Welty's Crystector

Reduces Static



Every set of the above two types should have a Welty's Crystector. Order now, \$4.00.

3-Tube DX Special

\$38.50

A kit of high quality parts individually tested. Makes up into an amazingly selective, abundantly powered 3 tube regenerative receiver. Considering the quality of parts furnished, this kit at \$38.50 is an exceptional value. Drawings and instructions included.

Write for our free Radio Catalog of newest parts

William A. Welty & Company
36 So. State Street, Dept. ER, Chicago

DEFINITION OF CARRIER WAVE

One often hears the expression in radio of "Carrier wave." It is usually referred to as the energy that comes from a transmitting or radio-casting station and which the aerial picks up and delivers to the radio receiving set to be "heard in the phones." In actuality it consists of two waves—one super-imposed or "riding" upon the other. The true carrier wave is a high frequency wave which varies in length, according to the desire of the transmitting station. It is merely a CONDUCTOR through the air of the sound wave, which carries the voice or music. The carrier wave, therefore, may be likened to a telephone or telegraph wire, which also is a conductor of sound waves which have been super-imposed upon it. You're welcome.

CONNECTING "C" BATTERY

The "C" battery, when used in the audio-amplifier circuit, should be inserted as follows: Connect the plus terminal of the "C" battery to the negative side of the "A" battery. This may be done at the most convenient place in the set. Connect the negative side of the "C" battery to the F or filament negative lead of the audio-transformers. In other words, in SERIES with the negative filament lead, but be sure the "C" battery is inserted as specified, or it will REDUCE your volume instead of increasing it if you don't. You're welcome.

CURING R. F. OSCILLATIONS

Troublesome oscillations in a radio frequency receiver sometimes may be subdued by varying the angle of the coils in their relation to each other. Reducing either plate or filament voltage, and perhaps both, also may help. You're welcome.

BORING HOLES IN PANEL

Always bore from the FRONT side of the panel. If the panel chips the disfigurement will be where it is not noticeable. Place an even and firm pressure on the drill, but not too much. Keep your bit sharpened. You're welcome.

PRESERVES AERIAL MASTS

Copper sulphate solution makes a good preservative for wooden aerial masts. You're welcome.

Questions—Answers

6-TUBE LOSSLESS

5010—CHICAGO: Having read so much about your "100% Lossless" six-tube hookup, I have decided to change my B.T. nameless to your "Lossless." Do you think it advisable? There has been so much said about "Grid leaks." My set works without one. Have a "Turn-it" grid leak. Is it satisfactory? Will your six-tube lossless do more than the nameless?

In the past few months, our Service Department has converted a number of Bremer-Tully Nameless receivers into our five and six-tube Lossless sets with great success. All parts in the Nameless can be used in our Lossless with the exception of the small regeneration control condenser. We omit this. The Bremer-Tully Kits are made for universal use, with a primary of each radio frequency transformer wound with a great number of turns to give a large amount of volume. But in a location, such as we have here in Chicago, with so many stations, we have to reconstruct the primary to gain selectivity, with a small loss in volume. We have found a happy medium to be about ten turns on the primary to gain the selectivity that is needed in Chicago. It is possible that there is enough resistance in your grid condenser to offset the grid leak. In this case your set may work better. The Turn-it grid leaks are very satisfactory. Our six-tube Lossless will perform much better than the Nameless.

NEEDS OUTSIDE AERIAL

5027—CHICAGO: I have a three-tube Ambassador coil hookup but have never been able to get distance on it. WJZ, KDKA, WQY, all in the east and nothing west. There is an Erla 21-plate condenser and Baby Erla condenser with 5 to 1 ratio, All American transformers. The set was not used during the summer months and now I can not get anything outside of Chi-

cago. I have 70-foot inside aerial with 25-foot lead-in. Where can my trouble be?

You are expecting too much of your receiver with an inside aerial. This type of receiver is to be used with an outside aerial, if distance stations are your aim. Would advise, therefore, putting up an outside aerial of 135 feet, including lead-in, if conditions permit. If space is limited do the best you can. Test your A and B batteries, go over your set and examine for loose connections and bad soldering. Make sure you have a good ground connection. Test your tubes, or make some of your friends try them out in their set that is working well. The accumulation of dust in your receiver on all parts will cause a high resistance leak across the terminals, which in time, will reduce the efficiency of your receiver.

DON MAC AIR KING

5035—CICERO, ILL.: I buy your weekly and have obtained some very good suggestions from it, therefore, I would like to gather some information regarding my set. I have a "Don Mac Air King" set—three-tube regenerative set. I use 301-A Cunningham tubes, have a good ground and aerial built per your instruction in your issue of Sept. 12, 1925. It seems that on short wave-lengths the stations that are so close together I cannot tune out either one without interference of one of the stations. Please advise me in regards to my "Don Mac." Is it a good or bad set? Also please advise how deep I shall place the old dry cell for the receiver ground as suggested in your issue of Sept. 19th.

The "Don Mac Air King" of 1924-25 was submitted to us for test and was quite selective. It used, in fact, "Everybody's 100% Low-loss" hook-up. We have not seen their later models. If it is the same as last year's model, and the same parts were used, it should tune sharply. If it isn't, it may be due to your tuning or your local conditions. Are you handling your tickler coil and the primary adjustment efficiently? Both mean much to selectivity and distance volume. You can put the dry cell sufficiently deep to reach moist earth.

PARTS FOR 6-TUBE LOW-LOSS.

5007—OTTAWA, ILL.: Dear Sirs: I want to build the 6-tube set on your first page of August 1 issue. I have a Buell three-circuit tuner and a General radio frequency coil and a Cardwell tandem condenser. Will this combination work together or will I have to get a General 3-circuit tuner to match? If I can use the Buell tuner, shall I follow instructions of wiring as given for the General tuner or would you please give a diagram showing me how to wire? Do you recommend a 201-A tube for a detector tube or should I use a 200 tube? I have three Thordarson 2 to 1 transformers and two Meloformers, how should I use them? That is, will I use all Thordarson or the two Meloformer and one Thordarson?

Your combination of parts is correct for the hook-up you mention.

The same directions for winding the General tuner can be used in the Buell tuner. We recommend 201-A tubes throughout. We would suggest that you use one of the Thordarson transformers of the first stage, and two Meloformers of the last two stages.

WHAT PRICE S.-M.?

5002—NEW YORK CITY: In your issue of September 12, 1925, you have the hook-up of a superautodyne six-tube receiver. I would like you to answer the following questions regarding it. (1) What is Silver-Marshall's address? (2) What is the price of the kit? (3) Does it use wet batteries and what size tube? (4) Can I get all the parts necessary to build the set in the kit sold by Silver-Marshall?

Answering your questions as follows:

(1) Silver-Marshall is located at 102 S. Wabash Ave., Chicago. (2) The price of the kit is \$57.00, complete with all the parts and hardware, but not including the cabinet. (3) Either storage battery or dry cell tubes can be used. We prefer the storage battery tubes (201-A). (4) Yes.

Additional Questions and Answers on Page 10.

German Ham Works Yank in Two-Way on Code

FOR the first time in the history of amateur radio an amateur station located in Germany and one in the United States successfully have carried on two-way communication by telegraphic code.

Actual limitation of radio equipment was followed by the war-time ban on radio communication in Europe, so that it has only been in recent months that an opportunity presented itself for a German amateur to attempt any such ambitious undertaking. In fact even now German radio licenses are confined to laboratory equipment and in consequence private communication is a matter of the greatest difficulty.

A station in Rottenberg, however, undertook the task. The oldest private station in Germany, it was backed by a considerable amount of radio experience and knowledge, although its operator thus far had lacked that pleasant thrill so common to American amateurs of communicating with almost all of the distant countries of the globe.

When circumstances were right, the Rottenberg station operator tried calling America. He already had logged calls from a number of stations, including 2AKB, and had some definite hopes. His "CQ," a general call for someone to talk to, brought a response from United States station 2AKB, owned and operated by Charles Butt of Schenectady, N. Y.

WEE BIT DOTS, DASHES

Amateurs generally are invited to send in notes for this department. We would like to have a good representation from every district. ARRL reporters are urged to use this or other departments freely. Address all communications to Ham Editor, EVERYBODY'S RADIO Weekly, 2721 South Michigan avenue, Chicago.

Ninth District

Hinds (9APY) is the new city manager at Berwyn, Ill. Send your traffic reports to him.

Chairman of QRM Committee is 9GO. Now that you know him, make use of his services.

Here's news: 9MT is on the air again with 100 watts on 165 meters. First night he worked 2UU, 2CKG, 2HH, and 5UR. Fine business for the high waves. His new QRA is Room 215, Humboldt Building, corner California and North Avenues, Chicago. A visit to his station will do you good.

The members of the Chicago CRTA are preparing for a busy season for traffic.

Officers of the Chicago Radio Traffic Association are: W. E. Schweitzer, president; Paul H. Davis, vice-president; R. C. Schweitzer, secretary, and W. F. Marguardt, treasurer.

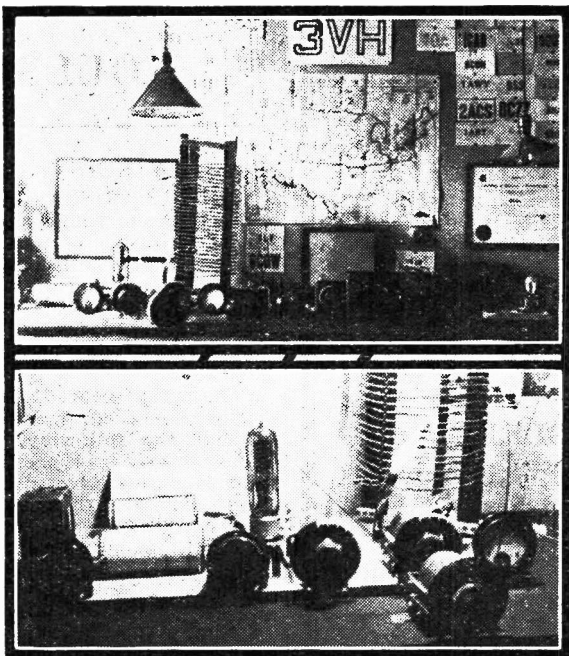
EVERYBODY'S RADIO Weekly Experimental Laboratory will soon be on the air with a ten-watt for both phone and code. Provisions are made for increasing the power later.

The meeting of Oct. 1st of the Chicago CRTA was a grand success. Attendance was good. The membership had the pleasure of entertaining W. H. Hardy (6 CMS) of Los Angeles, Calif. He said he was going to turn his six up side down and operate a station in Chicago. Mr. Dimock of the Chicago, Milwaukee & St. Paul Ry. spoke of the coming season with its possible destructive storms which will mean trouble with fallen telegraph wires cutting off the orders which are sent by the dispatcher to different stations. He said that he hoped that the amateur would be on the job to help wherever he could. He also said that he had fond hopes of being in the same rank as the amateur. Mr. Franzen and Mr. Dalton BCL's who attended this meeting have joined the CRTA with the intentions of being licensed operators soon. The wave motor contest closed at this meeting, Conklin (9DBF) being the winner of the contest, having the best constructed and most rugged wave motor. Conklin lives in Evanston and you can be sure he got the fifty-watt. F. B. Richards (9 WL also 8 AKR) Michigan, has been doing DX and handling traffic on a wholesale scale. He stopped off at 9 AFF's long enough to drop off a large full bag of choice apples from his farm in Michigan. Hinds (9 APY) of Berwyn, Ill., told of his trip to New York State and Canada. He said he heard DX in New York, that he never heard here, and that Canadian 30X, with his 500 watts, does little DX while Canadian 30H with 50 watts does wonderful DX. He said that he found most Canadian Hams using 50 watt A tubes. A committee was formed to take care of the traffic situation. Nichols and Ohrenstein (9 AWJ & 9 DWH) are chairmen of this committee. Bingham (9 AFF) said that it would be a good idea to go out and hunt up messages.

The Armour Institute Amateur Station (9 NV) will soon be open again, Fred Yocom is chief operator and the set will be used on 20 and 40 meters.

The Canadian Hams are sitting on needles and pins as they want to handle traffic with Chicago both ways. The Canadian Hams are very anxious to get their news West and South to Chicago as this is a very good traffic center for messages in those directions and all Hams are requested to be on the look-out for messages from Canada. Canadian Hams will be glad to handle any messages for any district up there.

9 MT is new on the air with fifty watts and will soon have 100 watts. He will be very glad to handle traffic for anyone and you can be sure that he will be dependable.



Two views of Canadian station, 3VH. Note the fifty-watt bottle in the center foreground of the lower picture. Photo by 9APY

CALLS WE'VE HEARD

J. Edward Wilcox, 9DDE, joins the ranks of EVERYBODY'S RADIO readers and has this to say:

I have just started reading your paper and want to congratulate you on your amateur department. The reason I bought my first copy was that I had read some place that you didn't print any studio news or pictures of artists in your paper and that you also had an amateur department. I think that you will find that hams support any paper that gives them some space.

Chicago hams and those around here have been depending on QST Magazine for their ham news, but if you continue your ham department I think that you may work up quite a circulation in the district and neighboring states.

Below is a list of DX worked at my station in the last week using five watts. I hope you will print it in one of your early issues.

DX worked at 9DDE, 3034 Leland Ave., Chicago, Sept. 14-20th:

1BG, 1ADW, 2CVU, 2AJX, 2CTY, 2AUD, 2BBN, 2BUY, 2AHK, 2CQZ, 2AUH, 3BWT, 3JO, 3LD, 3AHR, 3MQ, 3AFW, 4ML, 4OA, 5AUC, 8DFR, 8AFQ, 8BCI, 8DON, 8BQK, 8ADM, 8DRJ, 8AMD, 8QN, 8BKM, 8AME, 8PL, 8AMO, 8BSM, DX 9's, 9DUM, 9DEX, 9BNF, 9AMX, 9CE, 9AZQ, 9AOT, 9DXX, 9DWZ. All in daylight; 5PA work at night.

DX heard at 9DDE: Mex. 9A, 1K, 1B, CA; N. Z. 2AC, 4AG; Aus. 2YI, 5BG; French 8ZF. Miscellaneous: NPG, NRRL, NISR, NSF, WYH, WAP, KFUH, NQG-1, NPM, NPU, 6XAD.

Five watts here. Please QSL. Complete log kept.

9APY, F. J. Hinds, 3337 Oak Park Ave., Berwyn, Ill.: (3AFW), 3AVN, 3CJN, 4FY, 4LL, 4RZ, 5ANE, 5CK, 5UG, 6BOO, (6BWI), 6KT, (7AIB), 7AIM, 7NL, 8AHM, (8AQV), 8CDV, 8CUK, (8DBC). Canadian—(C-30H). Miscellaneous: KEL, WIR.

9DAV, Oak Park, Ill., 40 meters: U. S.—1CH, 1PL, 1QB, 1TE, 1WL, 1YB, 1AAE, 1AIU, (1AMS), 1ARE, 1AXA, (1AYT), 1BZC, 1CAW, 1CMF, 2CT, 2GY, 2KG, (2WC), (2ADU), 2AFN, 2AHM, 2AIU, (2AOF), (2ARB), 2AUO, 2BEO, 2BOX, 2BUM, 2CTY, 2CXL, 3HG, 3JO, 3JW, (3LD), 3ZM, (3ABJ), 3AUU, 3AVK, 3BMT, (3BSS), 3BTA, 3BVA, 3CEY, 3CHG, 4AJ, (4CU), 4EG, 4FL, 4V, 4MW, 4OA, 4OK, 4OV, 4PI, (4SH), 4SL, 4TF, 4UK, 4AAE, 4AHZ, 5AK, 5CC, (5EH), 5LG, 5NQ, 5OQ, 5OX, 5PH, 5QW, 5SE, 5UK, 5UX, 5VL, 5YD, 5AAB, 5AAV, 5ACV, 5ADO, 5AMW, 5AOL, 5APM, 5ATV, (5AUA), 5ZAI, 6VC, 6AGK, 6AII, 6BAU, 6BMW, 6BUU, 6BWW, 6BUR, 6CEJ, 6CGV, 6CNC, 6CSS, 6CTO, 6DAX, 6BYV, 6BTR, 6CEJ, (6AMD), (8AYK), 8BFQ, 8BKR, 8BT, 8FM, 8GI, (8PL), (8AMD), (8AYK), 8BFQ, 8BKR, 8BSC, 8BTR, (8CEL), 8CWL, 8DA, 8DAL, 8DGL, 8DSE.

Foreign: MEX. 1AA, 1C, AUS. 3BQ, 2DY, N.Z. 2AC, SO. AFRICA. 05K, P.R. 4SA, NAVAL NRRL, NKF, NVE, NERKI, XAI.

NOISY GRID LEAKS

Noises in a low-wave receiver may be traced sometimes to the glue that holds the paper label on the grid leak. These labels extend from one end of the leak to the other. The remedy is, of course, to remove the label.

HALF-WAVE RECTIFICATION

For half-wave rectification, a lower reading upon a direct current output ammeter will be obtained when a smoothing circuit is used than when the rectifier is connected directly to the load. A large size condenser will overcome it.

4B4 GETS ACROSS THE SEA

J. E. Hodge (4B4), Savannah, Ga., works a number of European countries with his inductively coupled Hartley, using two 250-watt tubes. Plate voltages up to 600 are obtainable from a home-made power transformer.

CONVERTED BROADCAST LISTENER

George H. Pinney (1CKP) was a broadcast listener who was not satisfied until he learned the code and then built himself a transmitter. He started out in 1921 with two five-watt tubes, but now is operating two 250-watters.

MUST BE EARLY BIRD

If you want to listen for Australia and New Zealand, amateurs, the best time is about 4:30 a. m., Central Standard time.

Canadian 50-Watter Heard by British

3VH Is One of the First Three to Operate on Twenty Meters

By 9APY

Canadian Amateur Radio Station C-3VH is owned and operated by A. R. Williams and is located at 56 Madison Ave., Toronto, Ontario, Canada. The pictures shown are about three years old but show the general layout of the station.

The transmitter employs a UV-203A (or fifty-watt tube) in a parallel feed loose-coupled Hartley circuit, with an input varying from 150 to 600 watts. The plate voltage is obtained from 60-cycle alternating current chemically rectified and filtered thereby giving a very good "DC" note.

Mr. Williams' receiver is of his own design and consists of a tuned primary, secondary and tickler with, of course, the usual two steps of audio amplification in connection. Mr. Williams is very prominent in radio, being holder of experimental call 9CS, besides his regular call 3VH. He is also city manager for the American Radio Relay League in Toronto and is an official broadcasting station as well as official relay station of the league.

It might be well to note that 3VH was the third station in the world to operate on 20 meters. Signals from this station have been copied in England, and the usual run of all districts of U. S. and Canada.

Four out of every five stations in Toronto are using receiving sets designed by Mr. Williams, who is also the originator of the circuloide coils used in his sets. A special feature of this station is the aerial which consists of but one wire which is very short and only twenty feet above a counterpoise of the same size.

Rag Chewer's Club Grows

As an illustration of the friendships that are developed through the amateur radio telegraphic communication, officers at the American Radio Relay League headquarters in Hartford, Conn., point to the rapid growth of an honorary group of league members, known as "The Rag Chewer's Club," which is devoted to the promotion of friendly conversations by amateur radio.

In the last few years, when amateur radio stretched out until it was able to carry on reliable communication across the continent and the oceans, the need became apparent for some organized group to foster this spirit of radio friendship.

A group of league members, in almost nightly communication with each other, formed the charter membership and established the rule that each other league member who carried on a successful half-hour or more conversation with some member of the "The Rag Chewer's Club" might also become a member of the club.

So popular has the organization become in the few months of its existence it has attained a total membership of more than 2,700 and recommendations for new members are arriving daily at the league headquarters.

There are members in every state in the United States and every province in Canada, but the membership that gives the greatest "kick" according to club members, is that which is gradually appearing in countries beyond the sea. Six countries in Europe and Asia already are represented. A well developed effort is on foot in many other nations where there are league members to enlarge the foreign membership of the "Club" by carrying on trans-oceanic conversations.

GOOD LEAD-IN INSULATORS

The small pyrex pudding cups make good insulators when two are used with a brass rod passed through holes in the bottoms.

PROBLEMS IN MICROMICROFARADS

To change micromicrofarads into microfarads, divide by 1,000,000; e. g., 500 micromicrofarads is .0005 microfarad. In other words, put enough naughts to the left of the figure to get left six places with the decimal point; e. g., 1000 micromicrofarads is .001000 microfarad; and the last three naughts can be erased. To reverse the process, you add naughts after the figure sufficient to allow you to point off six places to the right; e. g., .002 microfarad is 002000 micromicrofarads, and you erase the first two naughts.

MANUFACTURERS ATTENTION

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EQUIPPED
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PANELS

We are also supplying sub-panels complete, with Bakelite or metal sockets mounted to your specifications.



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Let us complete your kit with an attractive Walnut front and sub-panel, completely drilled and engraved.

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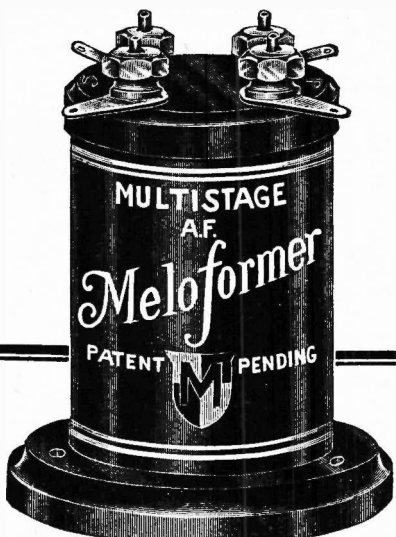
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**"Your Loudspeaker
Is Your Limit!"**

Works Four Stages

**If you can find a
horn to hold them!**



This is a Full-Size Illustration of a MELOFORMER. Note its small base-space—its compactness. You can mount three or four stages in the space used by two ordinary transformers.

The MELOFORMER Is Made Differently

Don't compare it with any other audio transformer. There is no other transformer like it. There never was one like it. It is different in physical design and construction. It is different in electrical action. It is a new transformer—a transformer that is built on an entirely different principle. All other transformers have cores built of laminations of iron—thin plates that lie on each other and which overlap each other. This is the way audio transformers always have been built. Manufacturers today follow this same idea. Just as did the manufacturer of the first audio transformer. This method develops strays. It creates distortion. It induces conflicting sounds due to interstage coupling. It prevents leakage flux. It automatically prevents stray coupling. The Meloformer does not use laminated plates. It has departed from the beaten path. It uses an iron core that is cylindrical in shape. It uses a shell that is cylindrical in shape. Both cylinders are slit longitudinally. This eliminates the troublesome eddy currents. It presents an evenly distributed iron path. It produces perfectly stabilized impedance. It prevents leakage flux. It automatically prevents stray coupling. That's why the Meloformer amplifies without distortion. That's why the Meloformer will operate three or four stages of audio successfully.

Keystone Sales & Service Co., 321 Broadway, New York
Chas. A. Etem Co. 3733 S. Western Ave. Los Angeles, Calif.
Keystone Sales & Service Co. Philadelphia, Pa.
Manufacturers Distributing Co. 1506 Pine St. St. Louis, Mo.
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If you want pure music and voice—as clear as the original, install Meloformers.
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No. 9 South Clinton St. CHICAGO
ROBERTSON-DAVIS CO., Inc.
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420 Orleans St., Chicago

The new model MELOFORMER is to be the season's sensation. Recent tests by Everybody's Radio Weekly Experimental Laboratories (Aug. 1 issue) show MELOFORMER works FOUR stages of audio amplification without distortion.

No other audio transformer has done this. Editor Wells says it is difficult to find a home-type loudspeaker—power or non-power or any tube, excepting the five-watters, that can handle the tremendous volume that pours forth from the FOUR MELOFORMERS. Three MELOFORMERS give more amplification than is required usually. In this case two 201A tubes in parallel on the last stage, or one Five-Watt Power Tube, was necessary to take care of the output. Two stages of MELOFORMER give forth tremendous volume (without distortion) by using two 201A tubes.

QUESTIONS AND ANSWERS

FACTORY SETS WE'VE TESTED

5050—CLARISSA, MINN.: In the early issues of your magazine you published write-ups of manufactured sets stating what results you have had with them. Would you please send me the complete list of names of the sets you have approved of? The last three numbers of your magazine sure are knockouts.

The manufactured sets we have described since our first issue last Fall include the following. The descriptions referred to are of last year's models as we have given no publication to the 1925-1926 models yet, with one exception, the Neo-Dyne, which appeared recently in these pages: Air King—March 28, 1925. Aragon—Nov. 22, 1924. Cincodyne—Jan. 10, 1925. March 7, 1925. Deresadyne—Jan. 31, 1925. Don Mac Premier—Feb. 14, 1925. Du-Ra-Co—March 14, 1925. Howard Neutrodyne—Nov. 22, 1924. Kennedy Model XV—Jan. 3, 1925. King Neutrodyne—Feb. 28, 1924. Liberty Five—April 11, 1925. Neo-Dyne—Feb. 21, 1924-Oct. 3, 1925. Operadio—Dec. 6, 1924. Paragon Type 4, Dec. 27, 1924. Pfanstiehl—April 18, 1925. R C A Superheterodyne—Dec. 13, 1924. Stromberg-Carlson Neutrodyne—Jan. 10, 1925. Superadio—Oct. 4, 1924. Super Zenith VII—Dec. 20, 1924. Transcontinental—Feb. 7, 1925.

ONE-TUBE LOW-LOSS

5054—CICERO, ILL.: I want to tell you of the success I have with your one-tube hook-up. This is the set that appeared in the February 7 issue which I just hooked up a few days ago. Just look what this set is composed of: The panel is made of wood. Condenser is a 13-plate Bremer-Tully. The tuner is a Gen-Ral which had body capacity, so I grounded the metal support of the tuner. Rheostat is Patent 30 ohm. The batteries are one 45-volt "B" and four dry cells for the "A". The tube is Cunningham type C-301-A. My location is not good for radio. My aerial is a sloping type about 110 feet including lead-in and the ground is not long enough, I know but I can't do any better. I have no trouble as to selectivity and distance, but would like a little more volume. Here's a few stations I tuned in Tuesday night, Sept. 8: WCX, WOC, WLW, WCCO, WGY, WDAF, WBZ, WSAI, WGR, KDKA. All stations fading badly. Here is one thing I find bad about this set and I'll say it's got me. Why will the set squeal when I touch the phone binding posts or squeeze the phone cord or even turn my head? I keep the tube at a point just far enough to hear signal whistle and no more. Can you tell of something that will eliminate this squeal which happens on the distant stations only? I'll say the set is all you say it is and 90-volts will give good loud-speaker volume.

You have a few too many turns on your tickler. Take about two or three turns off, and see if that will help you. You can also get in the same condition you mention by using too much "B" battery on the plate. You should not have any body capacity. If you have, the rotor side of your condenser should be grounded. Are you running the "A" negative and "B" negative together as we advise? Do you run this lead to your metal and plate (rotor side) of the variable condenser? Is the lead also through the bottom of the primary and secondary coil and thence to the "ground"? There should be a howl if you touch the grid circuit wire but otherwise the set should work without the howls if you have done as suggested.

PARTS FOR LOSSLESS

5036—CHICAGO: (1) Please tell me if Bremer-Tully R. F. transformers work and how in your Lossless five-tube receiver? (2) What size straight line condensers should be used with the above transformers? (3) What causes set to howl? (4) Using 10 to 1 All American A. F. transformers on first step and 5 to 1 on second, will this make tube spill over? (5) It seems if I turn rheostat on R. F. down I cannot hear distance. If I turn it up slow, at a certain point it will "plop" and signal is gone but I do not seem to find a spot in between. If I leave rheo-

stats set at a point just before the tube starts to oscillate and tune with condensers at a certain spot of any one of the three tuning condensers, tube or set will "plop." (6) Why does the "Lossless" five-tube receiver differ from any other receiver of the tuned R. F. type? How do you control oscillation? I do not use a "C" battery on my A. F. transformer, but some say it is not necessary. Please tell me. (7) I purchased a Freshman kit some time ago but did not get results. I took out the R. F. coils of the Freshman make and replaced them with Bremer-Tully's but the lower wave lengths are all bunched. I removed two plates from the Freshman condensers. This helped some but not enough. Elgin comes in at 10 and KYW at 60. Also set is broad in its tuning.

(1) The Bremer-Tully R. F. transformer will work in our 5-tube "Lossless" receiver. (2) Any good low-loss condenser will work with these coils, including their own make. (3) Too much regeneration, which means you have forced the tubes into oscillation. (4) Ratios too high causes distortion. It will not cause tube to "spill" however. (5) This is characteristic of the "Nameless" circuit. It is too critical to tune. (6) It has no "lossers" in the circuit. The coils are given wide spacing to prevent inter-stage coupling. It has controlled oscillations in the radio frequency tubes. (This is done with the R. F. rheostat.) A "C" battery should be used. (7) Your coils and condensers do not match. Use larger coils or smaller capacity condensers. Selectivity is controlled by the radio frequency rheostat. Make it like you would a tickler coil. Perhaps if you took off a few turns in the primary this would help get selectivity.

CAN'T GET DX

5038—CHICAGO: Have five tube B-T. outfit and have had good results all summer, but since cold weather has set in all Chicago stations seem to overlap and make it almost impossible to get DX. I am at present using a 125-foot aerial with twelve-foot lead-in. Kindly advise me if this condition can be remedied, if not then good-bye for radio.

The fact that your set worked all right this summer, proves that it is all right and that some change in your local conditions is responsible. The trouble could come from several sources. It might be your batteries. They may be discharged. One dead cell is sufficient to cause the trouble. Corrosion on terminals may be so great as to set up too much resistance. Your tubes may have lost their effectiveness. They may "light up" but the electron emission is so reduced as to be of no value. There may be loose terminals or connections in the set. There may be poor contact in jacks or rheostats. There may be poor insulation developed in jacks where oil or rosin from solder has soaked in on the strips of fibre and saturated them. One or both of your audio transformers may have burned out. One of the fixed condensers (by-pass or grid condensers) may be shorted. Your aerial wire may have collected oil, soot and dust on wire and insulators and too much resistance is set up. Insulation on aerial or lead-in may have worn out at some spot and corrosion occurred which means resistance and resistance reduces signal strength. Aerial may have dropped or sagged and now touches some grounded object. Although aerial may be covered with insulation, the radio current will leak off and reduce signal strength, especially if grounded object is damp or wet at times. Your variable condensers may have sprung plates and a "short" exists. Your tube socket prongs may not be making good contact with your tube prongs. Lift them up. You may be using too much "B" battery on the detector tube. You may not be using enough "B" battery on the amplifying tubes. Your phone or loud speaker cord may be broken inside the insulation. Your phone plug may be short-circuited. If these suggestions do not help you, bring your set to our Service Department or take it to some expert repair man.

Your Questions Answered

Clearing House for Troubled Set Builders

An Expert Aid on Construction and Operation of Sets

QUESTIONS can be answered only by mail. Write your query on only one side of the sheet and enclose diagram of your circuit whenever it will aid us in locating your trouble. Address all letters for this department to Question and Answer Department, care of this magazine. Inclose stamped and addressed envelope if answer by mail is desired. In writing to other departments, use a separate sheet of paper. This will aid us considerably in serving you quickly.

FIVE-TUBE "AMBASSADOR"

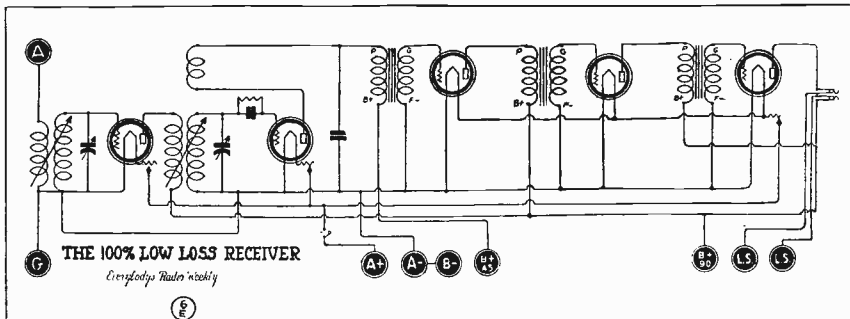
6318—ASTORIA, L. I., N. Y.: I read your "ad" in EVERYBODY'S RADIO Weekly, and I would like to know if your blue print, model No. 19, five-tube "Lossless," is a regenerative hookup, and if I can make out of my four-tube Ambassador a five-tuber. If I can, let me know and I shall send the money. If I can't, how can I add one more tube to the set?

Our model No. 19 five-tube "Lossless" receiver hookup is a tuned radio frequency circuit and is not, in the usual sense, a regenerative hook-up, although regeneration, to some extent, does take place, as it does in practically all circuits.

You cannot convert your four-tube "Ambassador" set into that hook-up without the purchase of other apparatus. Your audio amplifying circuit and detector circuit would remain as it is. You would have to remove the "Ambassador" three-circuit tuning unit and replace it with a radio frequency transformer, similar to the one which you use in your present circuit. You also would have to purchase another radio frequency transformer of the same type and this would be inserted in between the first stage and the third stage. This would mean rewiring your set entirely from the detector of the circuit to the left hand end of the set, you facing the panel.

You have a very good hook-up as it is, especially considering the number of tubes involved. You could increase the audio amplification of your set at very little expense and probably this would be the best for you to do, under the circumstances, as it would not require completely rewiring your set, nor not near so much additional apparatus. If you have sufficient room to permit, you might add one-tube and one extra stage of audio at the right hand end of the set. If there is not sufficient room to your cabinet to do this, then you might build a separate unit of one stage of audio and connect it up to your present set. This could be built in a small cabinet of the same height and general design of your present cabinet. We are showing "Everybody's 100% Low-Loss" hook-up with the three stages of audio in a diagram on this page. It does not show the one stage of radio frequency, as you already have that in your set.

You will have to be careful in the selection of the audio transformer which you will use in this third stage. It should be of very low ratio, say of no more than 2 or 2½-1. Even with the best of transformers, you are very apt to have some distortion, as few manufacturers design transformers of this type that will work efficiently in the third stage. The Thordarson 2-1 ratio would help you materially, as also will the General Radio low ratio transformer. The Meloformer, which has a popular sale in Chicago and the central west, but which is not so well known in New York City or other sections of the east, would be still better, as there will not be any distortion whatsoever, and exceptional tone qualities will result from its introduction.



Question No. 6318: Everybody's 100% Low-Loss hookup with three stages of audio. This hookup uses five tubes. It is quite necessary to select with care the third stage audio frequency transformer

There is a wholesale distributor of the Meloformer Company located at Philadelphia, which supplies the New York trade. Its name and address is given in the Meloformer ads in our magazine and may assist you somewhat, in locating a dealer in New York City, or suburbs, where one of these transformers may be purchased.

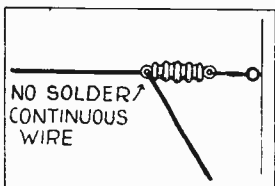
If you add this extra stage of audio, you will not have to disturb your present set at all, other than the addition of this one stage, as explained. We would advise you to follow "Everybody's 100% Low-Loss" four-tube hookup with your Ambassador apparatus, as it is a little more efficient. This would not mean that you would have to change your wiring to any material degree. The difference in our circuit and the standard "Ambassador" is largely in the battery connections. We run the negative "A" and negative "B" together, instead of the positive "A" and negative "B." We also run the negative filament lead through the bottom of both coils in the tuning unit and radio frequency transformer, thus making all of the apparatus at common ground potential. This will stabilize your circuit much better and give a slight increase both in volume and selectivity. We show the diagram of this circuit which explains how to make the changes.

It would be quite easy to make these changes. Run a jumper from the filament end of the secondary coils to the bottom end of the primary coil. Then run a jumper from your negative "A" binding post to your negative "B" binding post and cut the jumper that now runs from your positive "A" to your negative "B."

AERIAL LEAD-IN

4036—CHICAGO: Please illustrate by sketch how aerial is fastened to insulator if the lead-in is a continuation of the aerial. Belden enameled wire of 150 feet long to be used. I built the four-tube Low-Loss set with 199 tubes, using a "C" battery. Volume and selectivity was good, but distance fair. I then replaced tubes with 201-A. Set was broad in tuning. When "C" battery was removed set became selective. At this writing set became broad in tuning without changing set. What is the cause of this? Parts used are Ambassador tuner, Cardwell & Marco condensers, home-made radio frequency transformer and Thordarson transformers. Aerial is 120 feet long, including lead-in.

The antenna wire is fastened to an insulator at one end and the other end is left long enough to reach to the antenna binding post of the set. Instead of being fastened to the insulator it passes through and continues to the set. However, to make it taut it

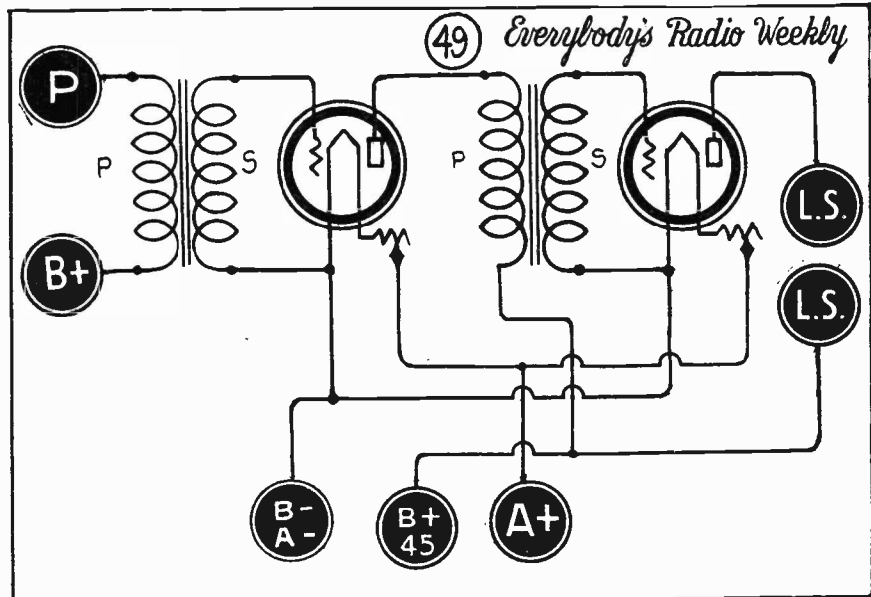


should be fastened to a porcelain knob style of insulator on the house just before it enters to the set. This insures better reception, as there is no separate lead-in and does away with losses caused by the joint where the lead-in is soldered to the aerial. Insulated, covered wire should be used for best results.

You must have made some change in this circuit to cause this sudden broadness in tuning. Perhaps it is because your primary is too close to the secondary. If you have a .0005 variable condenser on hand you might try placing this in the antenna circuit, and tuning it until you cut out local interference.

TWO-STAGE AUDIO UNIT

4183—PHILADELPHIA: Give me a hookup for a two-stage audio-amplifier unit. This is to be built in a separate



Question No. 4183: Two-stage audio amplifier unit to be used in a separate cabinet for the convenience of hooking up various detector circuits. It will save time and money in experimental home-set building. Procure two low-rate audio transformers, two tube sockets, two rheostats to fit tubes to be used and seven binding posts.

rate cabinet and to be used with any detector unit I may want to construct. I want to follow your various hookups as an experimenter, but do not feel it necessary to tear down and reconstruct the audio end every time.

Your idea is a good one. It will save you a lot of unnecessary labor. For instance, in building "Everybody's 100% Loss-Less" receiver, it would be necessary only to construct the one-tuber, or detector circuit. If you wish to build "Everybody's Two-Tube Loss-Less," which has two stages of tuned radio frequency, a detector and two stages of audio, you could build the radio-frequency and detector unit of those tubes and hookup your amplifier to it. The schematic diagram for this two-stage amplifier is shown on this page.

WINDS OWN TUNER.

5012—CHICAGO: I have been a reader with you from the first and thank you heartily for your help to those who roll their own. Now in regards to the help I wish of you. What are the number of turns and size of wire used in the Buell tuner (pri., sec., etc.). I have constructed the mechanical part of the tuner from your photographs and drawings and it works perfectly even to the ball movement primary. This will make the third tuner I have constructed this way and they all worked perfectly. The other two were the B. & P. tuner and Ambassador. Remember I have used nothing but your photographs.

And by the way in regards to the Buell tuner what size are the hubs of the spider web coils for the primary,

secondary and tickler?

Now give me your honest opinion on the best of Everybody's 5-tube sets as well as the cheapest.

This tuner has a 10-turn primary, 20-turn tickler, and a 65-turn secondary. The hubs of the spider web coil for the primary is about 2 inches, secondary about 3 and the tickler about 2.

Any of the 5-tube sets we published are good receivers, and of course, the different grades of the parts used would determine which set is the cheapest.

WINDING OWN COILS

5001—CHICAGO: I am listening while I write this to a good program with "Everybody's Three-tube 100 per cent Low Loss." My success with this set is, I believe, due to the fact that I followed your instructions to the letter. I now feel ready for "Everybody's Five-Tube Lossless" as shown in the August 29, 1925, issue, but want to wind my own R. F. coils for a .0005 variable condenser. How shall I do it?

These particular coils used in this hookup were "Benjamin" manufactured radio frequency transformers and they are too complicated to make without the special machine for winding them. We would suggest the "D" type of coil as shown in the illustration elsewhere on this page. The turns for a .0005 manufactured variable condenser are: Secondary, forty-two turns of No. 24 DCC wire, and the primary eight to twelve turns. Use No. 34 DCC wire on the primary. It would be better to have the antenna coupler

with a six-turn primary; the first stage R. F. coil, an eight-turn primary and the second-stage coil with a twelve-turn primary. For a .00025 manufactured condenser use fifty-five turns on the secondary coil.

A bakelite hard rubber or fibre tube, three inches long by three inches wide, is used. In the center a slot two inches long by one-half inch wide is cut. This leaves one inch of the tube not cut. In this piece are placed four binding posts, spaced evenly, two on a side. See Fig. 2, numbers one and two.

To wind, start the secondary wire at the top and go half way around, then up into the slot at the top and down around the other side to the slot, going up and crossing in the center at point No. 1.

This operation is repeated until all the turns are wound. After this work is done the ends "G" and "F" are brought back to the binding posts No. 2 and No. 3.

The primary is next started about one-eighth inch from the end of the secondary and wound in the same manner as the secondary, and the ends brought back to the remaining two binding posts; these are "P" and "B" leads. Fig. "I" shows a cross section of the coil and the arrows show the path the wire should take. No. 1 shows where the wires cross in both Figs. No. 1 and No. 2. The winding of the coil gives it the formation of two letter "Ds"—one reversed. From this comes the name of "D" coil.

The immediate advantage of this type of winding is in the fact that it gives a closed field running around and passing through the openings of the two "Ds." Because of this closed field

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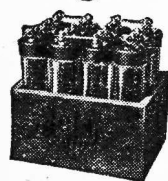
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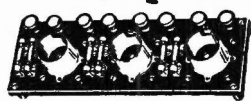


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no interference is noticeable from one stage to another, making it possible to mount all units very close together without creating trouble. There is no "pickup," either, by the coils, which greatly eliminates troublesome local or nearby stations.

4-TUBE LOW-LOSS

5028—BROOKLYN, N. Y.: Please enclose a diagram on the same principle as your one hundred per cent low-loss set, using one-stage tuned radio frequency, detector and two-stage audio. I have a "GENWIN" three-circuit coil, "Genwin" radio frequency coil, two "MIGNON" low-loss condensers, "FEDERAL" 65A-6-1, "ACME" 4½-1 audio transformer, C 300 C-301 A's and all other requirements. The three-circuit coil has secondary 30 turns, tickler 30 turns, and pri. six half-inch spaced turns. The radio frequency coil has, secondary 30 turns, pri. also six turns. If I can't use the coils as they are now, how many turns will be needed to use them, as I am in radio long enough to be able to reconstruct the coils?

The diagram for "Everybody's Four-Tube 100 per cent Low-Loss" is shown elsewhere in this department. Your parts are O. K. for the hookup, although you would get better reception with lower-ratio transformers. The number and turns of the secondary coils depend upon the size of the condensers. If for .0005 mfd. condenser, use 45 turns; .00035 mfd., 55 turns, and .00025 mfd., 62 turns. The tickler in all cases should be from 15 to 25 turns. Try the 25 turns first. If the detector oscillates too freely, take off a few turns until the tube works better. The primary coils on both the three-circuit unit and the R. F. coil should be for eight to ten turns. Thirty turns in a tickler coil are too many for smooth operation. Such high inductance makes tuning too critical.

UNMATCHED COILS AND CONDENSERS

5055—CHICAGO: I have built one of the old style Bremer-Tully Nameless circuits, using Flewelling .0005 mfd. condensers and am having trouble in my tuning. KYW comes in about sixty on my three dials. I called up Bremer-Tully Mfg. Co. and they say the condensers are too big and tell me I will have to cut some of the plates out so as the set will tune all over the dial and will not be so selective. As it is, I only use about three-quarters of the plates. Is there any way that I can spread the stations over the dials more, and how can it be done? All three dials tune the same.

You have the wrong capacity condenser for your set, of course. You should use a .00035 capacity for the coils you are using. This will spread your stations over the dial in the proper place. You could take out some of the plates, but an easier way would be to take off a few turns of the wire on the secondary winding. Take off three or four turns at a time until KYW comes in at about 90 on the dial. Reducing the capacity, of course, is the best treatment, as high inductance and low capacity gives the best results. Unless you are handy at such things, you had better reduce the coils as you are liable to ruin your condensers.

TRAVELER'S ONE-TUBE

5057—OAK PARK, ILL.: I have built a one-tube traveler's portable receiver per your instructions, wound the vario-coupler myself with No. 23 DCC wire, and am getting very good reception with it. I live only a mile from WGES, but do not have any difficulty in tuning it out when I want to. When I am listening to any one Chicago station I don't get interference at all from any other station. I can get any station in the Chicago district loud and plain. This includes WWAE, WJJO, WRR, WCEE, WHT, WOK, WCBU and WTAS. The only station I have not heard is SBC. I get all the above stations just as loud and just as clear as I get KYW, WQJ or any other Chicago station. In fact, I notice no difference in volume or quality in any of the stations. Can you explain this?

I use a 45-volt "B" battery with this set and can't hear anything at all with less "B" battery voltage. I have to use both aerial and ground as set will not receive anything on the ground alone. Aerial is sixty feet long and 15 feet above roof of three-story brick building. Lead-in is straight down to first floor and ground to steam radiator. I

heard WHAD at Milwaukee but not very loud.

Now I want to buy a set that will give good volume and very good quality, coast to coast on a loop aerial using loud speaker. (1) Please state what you think is best receiver for results stated above. The new Radiola Super-heterodyne, Remler Super, Silver Marshall Super, Operadio, Miraco, Best's Super Cincodyne, Aerovox, Neutrowound, Stewart-Warner, Silver Super Autodyne or any set you think is best. (2) If you recommend an assembled set before any of above, and I bought the parts, what would your price be to make set, using glass panel and glass cabinet? (3) I want a set that will not be obsolete for at least one or two years and would appreciate a detailed answer to all of above questions. I will want this receiver for use before the Christmas holidays.

We see no reason for complaint on your part of your set. It seems to be doing first rate. We have not had the opportunity to make a test in our laboratory on the following sets: The New Radiola Super Heterodyne, Aerovox, Neutrowound, Stewart-Warner. The following sets you name have been tested and have proven very satisfactory: The Remler, Silver-Marshall, Operadio, The Best, Cincodyne, Silver-Autodyne. These receivers are assembled kits and must be constructed with the exception of the Operadio. The others are manufactured sets. The service charges for building any of these is \$5.00 per tube. We would recommend an assembled kit, as any of the above mentioned receivers tested by us will give you satisfactory results for several years. It would take the Service Department about a week to complete a receiver for you.

(1) The primary should have from eight to ten turns, and moved as far away from the secondary as the tubing will permit. The tickler should be taken down a little, leaving it with about fifteen to twenty-five turns of wire. (2) You can use this coil in our 100% Low Loss with very satisfactory results, as published in the September 19 issue. (3) Your aerial seems to be O. K. (4) We would advise a single wire aerial in preference to the type you mention, if you could get the length. The longer aerial, even if it turns corners is better than the 40 foot aerial.

TRANSFORMERS FOR LOSSLESS

5037—CHICAGO: (1) Which transformers are best to use in the "Lossless" hookup? (2) Is Thordarsen 2-1-ratio all right to use? (3) In the hookup on page nine of September 19, 1925, issue is it all right to use Benjamin Electric Co. coils and .00035 condensers? (4) What tubes are the best to use in this set? (5) Please explain to me and is this O. K. on coil No. 11? Do I connect the antenna to P. on coil? (6) I am enclosing Benjamin Co. illustrations as to be connected. Please mark and return to me which applies to lossless hookup. (7) Just what does this tap on coil for stabilizing mean?

(1) Any good transformer will answer. Of course, we prefer to recommend those advertised with us, naturally, but others will answer. Karas, Thordarsen, Meloformer, Ambassador, General Radio, Muter and Wagner are among those advertised with us. Other good transformers, but which are not advertised with us, are All-American, Rauland-Lyric, Acme, Jefferson, Amertran and Federal. This is not the complete list, of course. (2) Yes, Thordarsen 2-1 ratio transformers are all right to use. (3) Yes, you can use Benjamin coils and condensers in the hookup you mention. (4) The 201A type. (5) O. K. (6) See diagram. (7) The tap on the secondary is for circuits utilizing the Neutrodyne principle for stopping oscillation.

USE GOOD PARTS

4024—CHICAGO: I have two Acme low loss condensers, 23-plate .0005, with Univernier dials. (1) What tuner and radio frequency transformer will best work with these to build Everybody's Improved Three-Tube Low Loss set with one stage radio frequency amplification? I have built a three-tube and one stage radio frequency amplification, using above condenser and home-made tuner and radio frequency transformer. All-American 5-to-1 and 3-to-1 audio transformers; three Bradleystats and one Bradley-leak; 45 volts detector, 90 volts "B"

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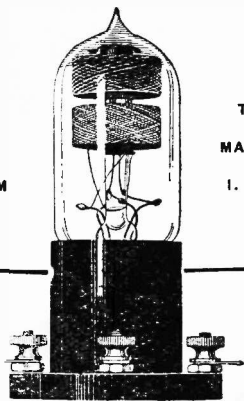
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battery, using 201A tubes with wet "A" battery. I would like to improve it. Please answer at your earliest convenience and oblige.

A tuner with a secondary of about 50 turns would be proper to use. Also a radio frequency transformer with the same number of turns in the secondary would match your 23-plate condenser. We believe that any Buell tuner would be satisfactory.

Undoubtedly the substitution of a tuner and the radio frequency transformer of recognized quality will improve your reception.

SEE SEPTEMBER 26 ISSUE.

5005—CHICAGO: Having been a subscriber to your radio magazine, for some time, surely wish to compliment you on it. It sure is all there is on radio. Have been troubled with radio with the "three-hand control" sets and am trying to figure out on making a two-control set using four tubes for portable or stationary. Was figuring on trying out using one stage of radio frequency, one detector and two of audio frequency. I have on hand two condensers, range from .0004 mfd. to .00009 mfd., straight line "Triangle Atlantic" low-loss condensers, two "Karas" transformers, plenty of sockets and rheostats and jacks, etc. (1) Could you give me a hook-up of something like this, not too sharp, as the Unilog is but a little more broad? I have a Unilog, but it is too sharp. I had it out to camp and it was not satisfactory in this respect. (2) Also size of coils and where obtained?

If you will refer to the September 26 issue you will find the hook-up you seek.

TUBES FOR ULTRALOGGO

4035—CHICAGO: Please answer the following questions about your Ultraloggo set: (1) I get better results leaving the grid leak across the plate and grid out. (2) I am using UV-199 tubes, 90 volts on plate of two-stage amplifier. I do not get as much volume from this set as I did from my three-tube Ambassador set.

(1) Some tubes operate more efficiently when the grid leaks across the plate and grid is left out. This is possibly the reason you are getting better results.

(2) UV-199 tubes, while all right, do not give the volume that you would get if you use UV-201A, with a wet cell A battery.

HOOK-UPS NOT PUBLISHED

4041—CHICAGO: Am a reader of your splendid weekly and am always glad when the latest issues are out. Have built quite a few sets that have been shown in your weekly and all have worked fine, except a reflex which I could not make work with 199 tubes. Am going to ask a question, and hope in the near future it will be answered in diagrams. Would it be possible to give the phans some depe on the three-tube Murad set that does not need aerial or ground? I heard one work last week and it sure was swell. Would sure like to know how to build a set such as this and I know it would interest many more phans.

It is not our policy to publish hook-ups of manufactured sets unless we have the permission of the manufacturers. We would suggest that you write to them direct.

USE FLEXIBLE WIRE

4049—ROCKFORD, ILL.: I am a subscriber to your excellent magazine and I have several times read of your using a certain flexible wire for wiring a set. I should be much obliged if you would send me a small piece of it, and also tell the address of some Chicago store where I could buy some by mail-order.

The wire you refer to is the Belden Rubber-covered number 18 or 20 flexible wire and can be purchased at the Belden Manufacturing Company, 2300 S. Western Ave., Chicago, Ill.

WANTS FLEXIBLE HOOK-UP.

4078—CHICAGO: Under "Lossless and Others" column 1, page 13, of your July 25th, 1925, issue I note your preference for a radio circuit. Before going further I wish to state that I use UV-199 or similar tubes only, and my principal use of a set is for local reception with ear-phones. My preference has been for a circuit almost identical to that shown on the first page of your issue with the exception of the use of a B-T .0005 Low-loss condenser and a solinoid wound secondary coil, air supported, with 180 degree

tickler and a seven-turn outside wound 1/4-inch spaced primary tapped at 1, 2, 4 and 7 turns. Secondary tapped at 15 turns from the filament end to reduce the minimum wavelength to about 150 meters or to convert the set to single circuit, as desired. Also an additional 15 turn primary solinoid wound at the grid end of the secondary and tapped at 3, 6, 9, 12 and 15. Three A. F. steps using 2-1 Thordarson transformers with jacks for detector, second and third steps. I have tried a number of times to add a step of R. F. using such a tuner and with various other substitutes primaries including the one recommended by Browning-Drake. My results have always been indifferent. I have been able to probably equal the results secured without the R. F. step but never to improve upon them. Do you think that you could add a radio step and attain appreciably better results, on DX, through doing so? The additional apparatus would be according to your specifications. It is my desire to be able to cut out the radio step and use the detector as it now is for local reception.

We would suggest that you change the detector three-circuit tuner primary to twelve turns of number 24 D. C. C. wire, spaced between the turns of the secondary. The antenna coupler may have a tapped primary of about 15 turns tapped at 12, 8 and 4. A little experimenting will tell the number of turns best suited to your antenna. Radio frequency coils should have a fair amount of spacing between each other and other parts, and it will be necessary to have a separate rheostat for the radio frequency tubes.

WHICH TUNER?

4025—JOLIET: Am a reader of your Radio Weekly and am coming to you for help. I would like to know which one of the three-circuit tuners used in your 100% Improved circuit is most efficient and best all around. Also I would like to make three stages of audio but do not know whether to buy Meloformers or Thordarson transformers for best results. Also tell me what ratio transformers to use in three stages.

Any of the three-circuit tuners we have published in hookups are satisfactory and have been successful. Before we publish a hookup we test several pieces of apparatus, and use the most efficient. Therefore, you will find that by following our suggestions on the use of the circuit specified, you should have same success we enjoy in our circuits. Either Meloformer or Thordarson 2-1 ratio transformers will give good results when used with three stages of audio frequency.

USE TWO ARRESTERS

4032—1. I have a four-wire outside aerial and a crystal set at each end as in diagram given. Please advise me if it is legal to use lightning arrester as per diagram. (2) How does static electricity travel, by the shortest path or the one with least resistance?

The Board of Underwriters specifies that a lightning arrester should be at or near the point at which the lead-in is brought into the house. Therefore to comply with their specifications you should use two arresters, one on each lead-in. (2) Both ways.

BOTH GOOD CIRCUITS

4050—CHICAGO: I have a six tube loss-less with doughnut coils getting fairly good tone and range, but I would like to build the new Silver-Marshall Super-Autodyne radio set which is said to have unsurpassable intermediate amplifier, non-radiating detector-oscillator and distortionless audio amplifier, selectivity and tone clarity.

I am writing you because I want the truth about this set.

Your Loss-Less should give you the best of service, and we would not advise you to tear it down in order to build the other set. Of course, if you would like to build the circuit, it is an excellent one, so is the Loss-Less, and if you are not getting the desired results there must be something wrong.

In view of this, we suggest that you bring it into our Service Department for an inspection. We have not experimented or tested the Pacent Super-Audioformer. Either the Karas, Meloformer, Wagner, Thordarson, Rauland-Lyric, or any of the other transformers we have specified at various times will serve you well.



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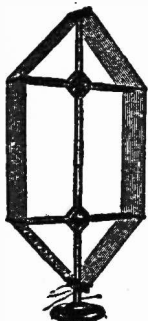
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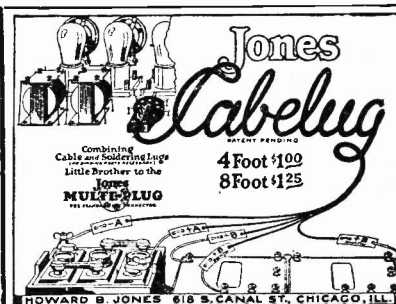
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Model 100B—100% Low-Loss Reflex 2-Tube	.75
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Model 101C—Unilog Reflex 5-Tube	1.00

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LOSSLESS WORKS O. K.

5053—COLUMBUS, O.: While I was in Chicago I was in your place and I got one of your blue prints of the "Five-tube Lossless" set using the "D" coils. I have constructed the set, and it is just fine, especially as I just put it together almost any way, and have had such good luck with it, I want to get some new parts and build it right away. I am giving you a list of parts I am thinking of using and would like to know just what you think of them: Three Remler condensers, capacity .0005; 2 all-ratio Rauland Lyric transformers, 5 Pyrex tube sockets, 3 Amsco rheostats, 1 double circuit Carter jack, 1 Carter filament control jack, 1 set of factory-made D coils, mount on a bakelite baseboard.

How much aerial should be used with this set? I was going to use Remler condensers as I have seen some sets where they are used and they were very good at separating stations. I would like to use them. If you know of any better kind, let me know.

We are glad to know of your success. The parts you mention are all good and will give you excellent service. The aerial should be at least 135 feet in length, including lead-in to set, or as near to that as possible. The condenser is a good one.

CHANGING VARIOCOUPLER

5056—HASBROUCK HEIGHTS, N. J.: (1) Have variocoupler with stator coil three and three-quarter inches in diameter and three inches in height. The rotor is two and three-quarter inches in diameter and one and one-half in height. I wish to make a three-circuit tuner such as in "Everybody's 100 per cent Low-Loss Receivers." I'd like to know the amount of turns on each winding, primary, secondary and tickler, to obtain best results. (2) When I turn on rheostat in detector stage, I hear clicking as the switch passes over the turns of resistance.

(1) Primary has ten turns, coupled half an inch from the secondary. Secondary has forty-five turns for .0005 capacity condenser; fifty-five turns for .00035 capacity condensers; sixty-two turns for .00025 capacity condenser. The tickler has fifteen to twenty turns. This remains about the same with any size condenser used. (2) You do not state what make rheostat you have. Therefore we are not able to give you a definite answer. It is possible that there is just a rough contact point. Try to smooth it out.

TWO-CONTROL LOSSLESS

5052—CLEVELAND, OHIO: Am interested in your "Lossless" five-tube and wish following information before building: (1) Could this be built as a two-control set and could you furnish hookup of same? (2) Which would be most efficient Aero coils or Harper for this set? (3) How do "D" coils compare with above? (4) Could I use one stage transformer audio and two of resistance coupled? Would this improve tone quality? (5) I have built 4-tube set with one stage radio, regenerative detector and two stages audio, using Bruno No. 77 and No. 55 coils, Cardwell condensers .0005 and Lyric transformers. Local stations come in with lots of volume even without an antenna or ground but are distorted. What could be wrong? (6) I cannot get outside stations except Detroit on high wave length. I get lots of whistles but cannot bring the stations in. Just put in new tubes and charged batteries. What might be wrong? (7) I get locals at about five or six places on the dials. What causes this? (8) Would the Aero antenna coupler be helpful in this circuit?

(1) Yes, tandem or dual condensers could be used in the last two coils and ordinary condenser in first stage. No special hookup required. Make the connections as if they cover three separate condensers, which is a fact. (2) Both are highly efficient, the Aero coils or the Harper. (3) When properly built the "D" coils are equally as efficient. The Ellis "D" coils are O. K. (4) This hookup could be used and will improve the tone. It will require more "B" battery. We would prefer two stages of audio. Such transformers as Karas, Thordarson (in ratio of 2-1) Meloformer, Wagner, General Radio, and that type would give you wonderful tone quality and more volume. (5) Distortion may be due to the inefficient tuning of the tickler coil, and the variable condensers. (6) We refer you to the answer of Question 5. (7) Prob-

ably due to the fact that the local stations do not filter out their harmonics. We have one or two Chicago stations that persist in the same inefficient transmission. It is no great credit these days to the operating engineers to permit harmonics at a radio cast station. Your set is not at fault and so long as the station continues to be operated in this manner, you are helpless. (8) Any good antenna coupler which has a variable primary, would be an improvement.

SIZE OF COILS TO WIND

5026—CHICAGO: I have been using the "100% Low Loss" four-tube hookup from an issue of a few months ago. Selectivity was my aim, and I have been pleased with the results. I made the antenna coupler myself, mostly by guess, and I think I could improve my set if I had that unit as it should be. Would you please answer my questions: (1) Diameter and length of tubing on which to wind coil? (2) Size and kind of wire. (3) Number of turns on primary. (4) Number of turns on secondary. (5) Distance between primary and secondary. (6) Should the antenna circuit tune as sharp as the detector circuit?

(1) The size of the tube is 3x3 1/2 inches. (2) No. 24 D.C.C. (3) Ten turns. (4) You do not state what size condenser you use. For a .0005 capacity, 45 turns; for a .00025 capacity, 62 turns; for a .00035 capacity, 55 turns. (5) About one-half inch. (6) The antenna circuit should tune as sharp as the detector circuit.

4-TUBE AMBASSADOR

5030—BRONX, N. Y.: I am a reader of EVERYBODY'S RADIO Weekly and am very much interested in the page "Your Questions Answered." (1) I have a four-tube Ambassador set that pulls in the locals as loud as a five-tube, but I don't get any distance. It is not my locality because a man next to me gets everything. (2) Also, I have interference on stations below 360 meters.

It may be that you have one of the old type Ambassadors which are not so selective as the new models. On this the primary was too large. If you have one, the coil must be made more selective. This is done by taking off the primary winding which probably is fifteen turns of wire wound on one end of the tube. Separate it by a larger space from the secondary or larger winding on the other end of the tube. We would advise using a new wire for the primary. This is to be of No. 16 to 18 D.C.C. wire. Wind one at extreme end of the tube and as far away from the secondary winding as possible. Just eight turns of this wire. The further away you get this winding from the secondary, the looser the coupling will be. In turn, your set will be more selective. If you follow the instructions carefully, the coil will be a very efficient one.

A. F. TRANSFORMERS

5033—CLEVELAND, O.: You specify Thordarson 2 to 1 ratio in some of your hook-ups and I would like to ask the following: (1) Can I use the Thordarson 2 to 1 with good results in a circuit I intend to build which suggests two 3 1/2 to 1 ratio transformers? (2) Which will give the best tone and volume for two stages? All American 3 to 1, Thordarson 3 1/2 to 1 or Thordarson 2 to 1. (3) Would two Karas Harmonik's be any great improvement over any specified in the above question?

(1) You can use the Thordarson 2-1 ratio transformers with good results. (2) The Thordarson 2 to 1. (3) The Karas would be an improvement over the others mentioned.

PLANS BALLOON AERIAL.

5032—EVANSTON, Ill.: I have been thinking of erecting a vertical aerial by means of a small hydrogen balloon on the upper end to keep it up straight. (1) Is this practical? (2) What are its advantages? (3) What are its disadvantages? (4) Would the results be any better than most common aerials? I've built "Everybody's 100%" three-tube and it works 100% swell.

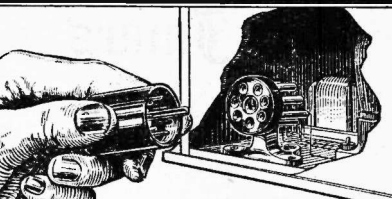

(1) It is practical. (2) Takes little space. Good volume and distance. (3) It is broad, could sway and cause signals to fade in windy weather. (4) No, the results would not be better than the common aerials.

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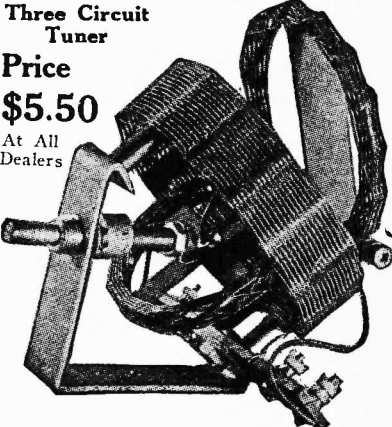
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Phorum for Phans

Readers of EVERYBODY'S RADIO Weekly are invited to express their comments and opinions on timely subjects of general interest through this department. There are no restrictions except that you must write on ONE SIDE of the paper only and you should confine your remarks to a legitimate discussion of subjects of general interest. The editor assumes no responsibility for the opinions of those who contribute to this department. Address your letters to Phorum Editor, EVERYBODY'S RADIO Weekly.

Edward, the Jeweler, Writes

Edward, the Jeweler, 32 Sixth avenue, New York City, writes again. He refers to our comment to his recent communication in the September 26 issue, and says:

No, I made no mistake. Ninety on radio, forty-five on audio is correct. I can loudspeak Chicago any night with both audio tubes out of set, plugging speaker into detector jack. The 45 volts will not do it. With 67 volts one can hardly hear any distant station. I get, if I have no interference from neighborhood sets, and I am able then to boost my regeneration. I can do it on all city stations during the summer when it was too hot to close doors and the folks were in bed. I would sit and listen to its low, sweet music, in fact, without audio. It is the only real true reproduction of human voices.

I work on this theory: If we use radio to boost weak signals, why, boost them for all you can. Radio frequency will not distort. If you give it more than it can stand it chokes and the output gets lower and lower. Now, I work on this theory: If my signals are stronger, my audio need not be so much, hence I use General Radio 5½ transformers and use 45 volts. If you try 90 volts, you will find it too heavy and powerful and it has a tendency to distort.

You write B-T is a Bucking Bronco. Again you are right—it is; but to make a set yourself and simply solder wires into place with a blue print in front of you is in reality not building a set. It is like

checker playing. Any one can play checkers, yet one in a thousand, when they move a piece, know why they moved it; so in radio (why is this wire put here or there?). If they only took an hour longer while building to find out they would have accomplished much.

You say it is evident I am a new reader. It was not my fault. For weeks I have been asking for it at the different news stands. No one knew it. No one had it. Two weeks ago one stand put it in because I asked for it. Last week they all had it. This week, today, which is the day they get them, by 12 o'clock noon over a dozen stands I called at had completely sold out. They are re-ordering, so I can get a few copies.

There is nothing that succeeds like success. I certainly wish it to you, and I am a very good prophet. In less than one year you will have the largest circulation of any radio publication in America, and why? Your editorial in a recent issue, "Why tuned Radio is so popular," is one of the reasons. In the words of Shakespeare and Ted Lewis combined, in promulgating your esoteric cogitations "You said a mouthful." And I will go a little further. They (the five-tube manufacturers) are making the public (the ones who are unable to build themselves) buy just what they feel like giving them for their money.

The first machine I ever owned was a R. C. A. Radiola grand. I do not know why they called it "Grand" unless it was the 360 smacks it cost. I sold it for \$80. I understand the man who bought it from me, since the strike is on, is using it for a coal bin.

Well, you'll have to show up, Friend Edward. It's true the 90 volts will work a 201A detector tube without much difficulty, but a truly good detector of that type, one that brings in the distance, is a little "softer" than the usual run, and such a high plate voltage would have a tendency to choke it up. Of course the audio will work on the smaller plate voltage, but if you want real volume, not only stick to the ninety, but run her up to 110 or even 120 and see the difference. Thanks for your kind words.

Wants a "Pink" Sheet

C. W. Schledorn, 2152 Wilson avenue, Chicago, says some mighty nice things and then tells of his troubles. He writes:

Have been a reader of EVERYBODY'S RADIO Weekly since its first issue and heartily compliment you on your policy of honesty. Readers can readily discern that EVERYBODY'S RADIO Weekly stands as a peer in demonstrating that its policy spells success. Have gone through the B-T. tuner and .00025 rated condenser experience and many other inconsistencies, hence know what it's all about.

Now, that EVERYBODY'S RADIO Weekly has taken on a national career it appears to me that I should look forward to a "Pink Sheet" supplement with Chicago special news. At least that's the quandary I am in, for I cannot conceive how it is practically possible with some esthetic reservations, to erect an ideal aerial of 135 feet on an average occupied city lot of 125 feet. This being your requirements to insure efficient performance of a 100% three-tube regenerative receiver and others. My aerial is only 75 feet straightaway, plus a 30-foot lead-in, and consequently insufficient for DX, as proven by experiments.

My location is by no means ideal, being from one to two miles westerly of five broadcasting stations, with emphasis on "broad."

Have shipped my receiver, a three-tube "Everybody's 100% Low-Loss" model, to a friend's summer home, eighty miles from Chicago, and found him thoroughly pleased as the set functioned very good in his location.

As it is quite a problem for me to decide upon the several designs that have appeared in your weekly, I am appealing to you for your recommendation as to the best receiver design for my location and aerial conditions. Construction details and tubes not limited.

We hope we won't get into the "pink sheet" habit, Mr. Schledorn. We try to put a lot of "color" into our stuff to make it interesting, but pass up the rosy hues for fear we will run too much towards "yellowishness." That's fatal, you'll agree.

Now, of course, we do not expect all our city readers to be able to build 135-foot aerials. We merely say that length is IDEAL. The nearer to the ideal the better you are situated. At that you ought to get pretty good distance with a three-tube on a seventy-five-foot aerial, and it certainly should be selective to a superlative degree. Perhaps you are not tuning your three-tube very efficiently. That's a common fault with those that do not get desired results.

"Everybody's Five-Tube Loss-Less," described on page 4 of this issue, ought to do all you ask of a receiver. The Silver-Marshall standard seven-tube superheterodyne certainly will be selective enough, will give you good range and have volume.

Forgets His Name

One of our readers in New York City writes a very interesting letter, but fails to sign his name or give his address, so it was impossible to write him as his case merited. He says:

I read with interest your discussion on the Bremer-Tully tuner, which you say is highly efficient (Oct. 3 issue), but the primary is poor and you hope they will correct it. I wish to call your attention to a similar defect with their condensers. That wonderful lifetime bearing! I only had the condensers a month when trouble developed with wobbly shafts. Adjustment was impossible, either too tight or too loose. Bought two more. Similar trouble developed, but has for the time being been remedied by adjustment. The condenser is undoubtedly good. They are very careful, yet neglect the rotor bearing on which the pigtail end is. They certainly could not put a cheaper arrangement on an otherwise excellent condenser. On the market here in New York is a L. L. F. condenser selling for \$1.00 and \$1.45, and it certainly is worth \$1.45 to examine the two condensers comparatively and note how careful they have been on the point which the B. T. neglects. This is called the "Pilot" condenser. Surely if they can put such good end bearings on a list-price of \$1.45 condenser, how much better should the B. T. be for \$5.50 list! I was about to make up a circuit with B. T. coils, but I hesitate to use condensers further.

Defends "Major" Armstrong

L. S. Hillegat (9HO), of 229 Ninth street, Milwaukee, Wis., takes us to task for what we said in an editorial about Armstrong and his attitude towards infringers. Here is what he writes:

I have read with much interest your editorial on the popularity of tuned radio frequency and feel that you have made many points that the radio public should be informed of. I feel, however, that you have misplaced the blame a little when you bring Mr. Armstrong's name in.

I am not in any way connected with the Westinghouse company, nor is it my pleasure to be acquainted with Mr. Armstrong. I have, however, a great deal of respect for a man who has passed up from the amateur ranks into the physicists' class. Incidentally, I don't believe Mr. Armstrong has yet acquired the coveted Ph.D., as would be indicated by your use of the title Doctor before his name.

Two minor errors, at least, have crept in your article, and I think in justice to those concerned you might correct them. It was Mr. Armstrong who granted a number of licenses for the use of his reaction circuit, not the company to whom he later assigned the patent. And he assigned his patent to the Westinghouse company before they connected with General Electric through the Radio Corporation. It was believed at that time by more than one, in all probability including Mr. Armstrong, that the two big electrical companies were in keen competition, and the assigning of the patent to the Westinghouse people served at the time to offset to some extent the already good grasp G. E. had on the radio patent situation. After the combine, which Armstrong did not foresee, he probably had much to regret.

I believe Mr. Armstrong is a consulting engineer for the Radio Corporation now, but he is a technical man and must work somewhere. Perhaps the G. E. is best able to pay him his price. I believe he only works part time, and is at the Marcus Hartley Laboratory, Columbia University, rather than in the Radio Corporation's laboratory. Perhaps he, like other technical men, who for the most part are illy paid, has made a trade with necessity. It seems to me he is not of the type that would do something to retard progress.

If you got the impression that we were directing an attack on Mr. Armstrong in an editorial in the September 26 issue, you are mistaken. We have the utmost respect for him. We only refer to him in the abstract form.

Nevertheless, the fact still remains that the powers who own the Armstrong patents are refusing to license other manufacturers, and that the popular crowd, especially the "gyp" manufacturers, naturally turn to tuned radio-frequency. If the regenerative patents were thrown open to the public you would see the entire tribe rushing in to put three-tube sets on the market.

Likes Our Ways

Rudolph J. Hluberry, 406 East 71st street, New York City, writes:

I consider EVERYBODY'S RADIO Weekly the best radio magazine published. I enjoy reading every line. You certainly are a square-shooter and your policy of naming each part used and telling the truth about them is making a hit in this town. I never knew I could get so much information in any radio magazine until I ran across my first issue. Regret I did not see your magazine a year ago.

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SETS—FOR SALE

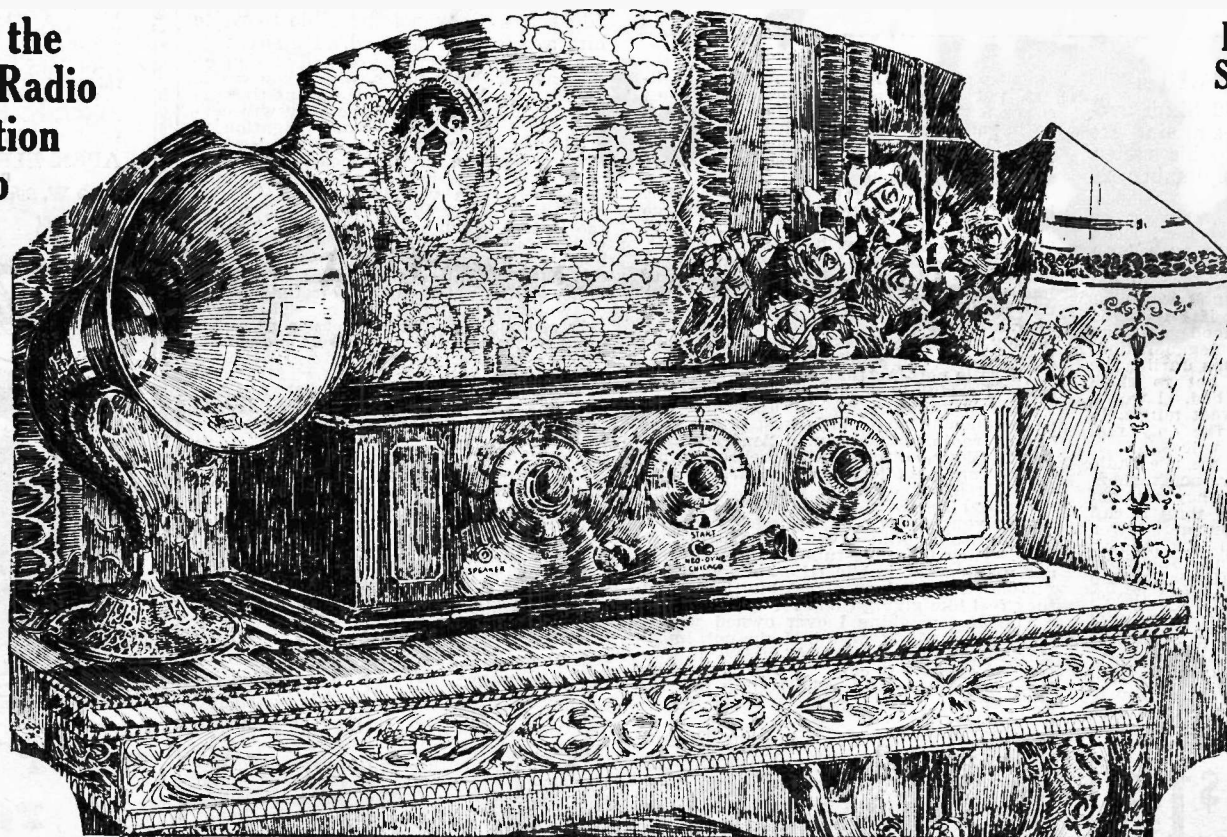
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