

# RADIO SERVICE TREATISE

AND  
RADIO BARGAIN CATALOG  
FOR RADIO SERVICEMEN-  
RADIOTRICIANS-RADIO DEALERS

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# Just a Minute!

**O**UR thanks to all of our friends, for the multitude of letters which you have sent in response to Catalog No. 23.

We thank you also for the hundreds of suggestions which you have sent in, during the past few months, in connection with the catalog.

We have incorporated in the present issue not only all these suggestions, but many others; as you will note by going through this instructive book.

Of course, the book has been greatly enlarged; since we have added a voluminous amount of new editorial matter which, we know, will be of lasting interest to you, and make it worthwhile to keep the Treatise-Catalog on hand for months to come.

We can only repeat what we said in our former catalog, and that is: We are giving you—the radio service man, the radiotrician, the radio dealer, and the radio experimenter—a book that means something. This, in our opinion, is a lot more than what the usual run of catalogs offer.

We hope and trust that the new book will please you, not only with the additional information presented in its pages, but also the hundreds of new items we have added at prices which, a few years ago, would have verged on the fantastic. Never before have you been able to buy first class radio merchandise at such very low prices, and we doubt if you ever will have the chance again.

We repeat that the owners of the Radio Trading Company who have been in the radio business since 1908—(it was then called "wireless" and not radio)—have a pretty good idea what you radio folks want, and what is in your mind; and that is why we give you a catalog with real information, so that you know ahead of time exactly what you may expect. You never buy a cat in a bag with Radio Trading Company; for we give you all the expert technical information on every article that it is humanly possible to obtain for you.

In presenting you with this third issue of the RADIO SERVICE TREATISE, we trust that it will help you daily to solve your particular radio problems; that is its purpose.

With thousands of letters offering worthwhile radio suggestions for editorial purposes in the RADIO SERVICE TREATISE part, we have awarded \$3.00 for each of the best suggestions submitted.

The idea has been so successful that we are going to continue this offer in the future; all suggestions received and accepted as best will be printed in later issues, and \$3.00 will be paid for each one.

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It is manifestly impossible to list every radio item in our catalog, and we try to bring you those items for which we know there is a general demand.

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**25 West Broadway**

**New York, N. Y.**



# RADIO SERVICE TREATISE

By The Radio Engineering Staff of The  
RADIO TRADING COMPANY

## Modernizing Old Radio Sets

One who carefully studies the circuit diagrams of the old tube battery sets so popular a few years ago, and compares them with diagrams of the modern all-electric receivers, will find that, fundamentally, the circuits are the same. There has been no revolutionary change in the method of radio receiving; the old ideas prevail. What, then, is the difference? he may ask. Surely, the modern receivers are much better in tone quality, volume and simplicity of operation—and they require less attention, having no batteries to charge or replace.

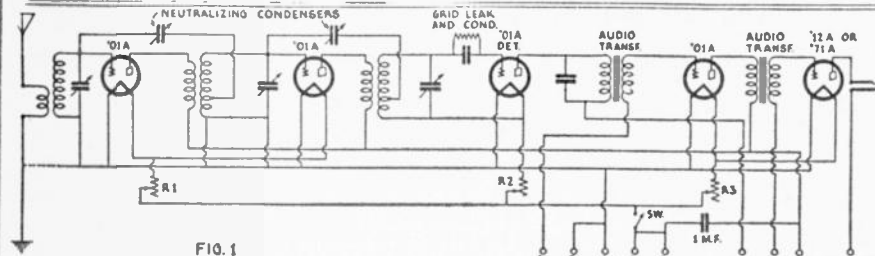


FIG. 1

The answer to this question is simple: the modern sets use more power. With a comparatively unlimited supply of electric current from the lamp socket, much higher operating voltages are possible. Larger and more powerful tubes can be used in the receiver; electrodynamic speakers can be operated with ease. And all this means that the set can be operated at normal volume without overloading or crowding the tubes or speaker; and that the bass tones, which are considerably more powerful than the higher tones, can be reproduced with their full energy. Hence, the entire electric set has a fuller, richer tone quality than the older battery models. Add to this the advantage of having no bothersome batteries to take care of, and some mechanical refinements, and we have the main differences between the electric and the battery sets. So far as sensitivity or distance-getting qualities are concerned, some of the old battery sets can give the modern electric ones a run for their money. The general use of screen-grid tubes might modify this statement somewhat, but not very much. A three-dial-control battery set can be adjusted to a much finer and more sensitive setting than can any of the single dial-control sets.

Since the battery sets are so near like the modern electric power sets, why discard them when they can so easily be converted? With a few easily-made changes or alterations, we have these advantages:

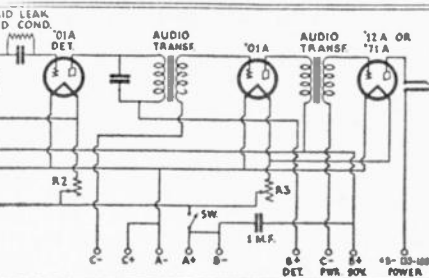
- (A)—No more storage batteries to charge or take care of.
- (B)—No "B" batteries, to run down and cause distortion, requiring replacement with new ones which are costly.
- (C)—The use of power tubes with their consequent improvement in tone quality and volume, becomes economical.
- (D)—The successful operation of a dynamic speaker is thus permitted.
- (E)—Electric reproduction of phonograph records is made possible.

You might offer objections to (A) and (B), above, on the grounds that an "A" and "B" eliminator may be employed, and, rightly so. A battery set operated by an "A" and "B" eliminator is as satisfactory as an all-electric one; however, it requires much more attention and is more bulky. Furthermore, commercial "B" eliminators do not give the power required to operate a large power amplifier. Therefore, having decided to convert the battery set to an electric one, let us go over the necessary steps required to make the change.

## How to Convert Battery to Power Sets

In converting a battery set to an electric one, some new parts will be required. The difficulty of obtaining suitable parts for making the change has, no doubt, deterred many set owners from doing so; and it also explains why so many good battery sets have been discarded. But now this condition no longer exists. Good parts, such as power transformers, resistors, etc., can be purchased at an unusually low figure—one lower than the original manufacturing cost on account of over-production and the change in set models by many manufacturers. With these parts now available at such a ridiculously low figure, you can not only change over your own battery set but also add a successful side-line business to your present radio service work—by purchasing old battery sets, or sets taken as trade-ins, converting them to electric sets and selling them at a good profit. Many Service Men and radio dealers are now doing this. And these same parts are ideal for replacement in standard radio sets requiring servicing, or building new ones.

In describing the method of converting a battery set to an electric one, we obviously cannot list every type of battery set that has been produced and illustrate each of the necessary details. The best we can do is take a typical battery set diagram—one representative of the great majority of battery sets—and show how it can be converted. The sets are nearly all alike—they vary mainly in the number of tubes employed and in the methods of control. But since the old methods of control will be discarded anyway (with the exception of the tuning dials) we can pass over these.



Therefore, in making the change-over, we have to consider the following:

- (A)—Number and types of tubes to be used;
- (B)—Changes in filament circuit;
- (C)—Changes in grid or "C" bias circuits;
- (D)—Changes in power-supply or plate circuits;
- (E)—Volume control;
- (F)—The power-supply system. This will be described in detail later.

## Changes in Filament Circuit

If we take each of the above steps, and complete one after the other carefully, the battery set will soon be correctly changed over to an efficient A. C. electric one. As a representative diagram of a battery set, we will take that shown in Fig. 1, which represents a standard five-tube battery operated set using a type '12 or '71 tube in the last socket. This is a neutrodyne circuit, but this fact makes no difference; for no changes will be made in the tuning system. Three filament control rheostats are indicated in this diagram: R1 for the radio-frequency amplifier; R2 for the detector and R3 for the audio-frequency amplifier. No volume control other than these rheostats is indicated. But this makes no difference, because all filament rheostats and volume controls, if any, are to be removed. We will add our own volume control later. The filament switch will hereafter be connected to the A. C. line supplying the power pack—to be described later. It will be necessary to replace the switch previously used with a more rugged one, on account of the higher current and voltage which it interrupts.

Having removed the rheostats and volume control (if any) from the panel, the next step is to remove all filament wiring from the sockets; as we will need special filament wiring. This done, remove the detector socket from the set-panel. After these parts have been removed from our battery set, the diagram will be as shown at Fig. 2. No matter what type of battery set you have, it should look something like Fig. 2 after the unnecessary parts have been removed. If there are any jacks on the set, other than that connected with the last tube, these may be removed (or allowed to remain, unconnected, on the panel), and the audio transformers connected directly, as shown in the diagram.

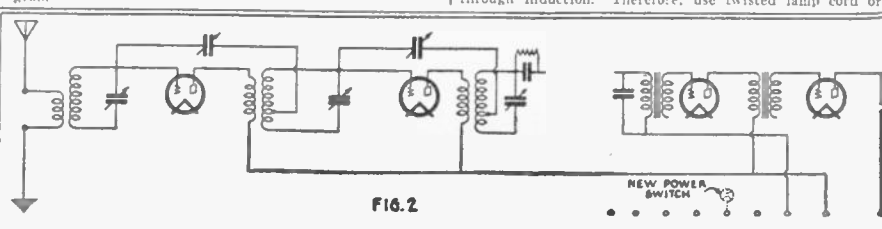


FIG. 2

## Selection of Tubes

Before we proceed any farther, it will be necessary to select the proper tubes. With the exception of the detector, we could light the same tubes (usually '01A) used in the battery set with A. C.; but the filaments of these tubes are so fine that they heat and cool rapidly and their temperature would fluctuate when lit on alternating current—which rises and falls 120 times a

second. This would produce a serious A. C. hum in the loud speaker.

The type '26 tube has been designed to overcome this objection. It is similar to the '01A, except that it has a much thicker filament which will not rise and fall in temperature rapidly—it stores too much heat—consequently it will work very well in the A. C. set. Its filament voltage is 1½, and the filament current drawn is 1.05 amperes. This tube is suitable for the R. F. amplifier and the first stage of the audio amplifier. While there is a very slight trace of A. C. hum, even in the '26 tube, this hum is at an audio frequency and will not be amplified by the radio-frequency amplifier. When it is used in the first stage of audio, the slight hum is amplified only by the last audio stage; and the resulting hum is still too weak to be objectionable in the loud speaker. For the detector, however, this condition will not do; the slightest trace of audio A. C. hum in the detector will be amplified by both stages of the audio amplifier, and the resultant hum in the loud speaker will be enormous. Therefore, a different type of tube will be required in the detector socket—which explains our reason for removing this socket from the set.

## The Detector Tube

For the detector it is absolutely necessary to use a hum-free tube, and for this we select a '27 tube, of the type shown in Fig. 3. Instead of the usual filament, it employs a cathode—a separate electrode which is not connected to the heater. The heater is a heavy filament, lit by A. C., at a voltage of 2½, and it draws 1.75 amperes. An insulating tube is placed between the heater and the cathode; the heater becomes so hot that it heats the cathode to a dull red, causing it to emit electrons just like the filament of an ordinary tube. But, since the cathode is not electrically connected to the A. C. circuit, there is no trace of hum allowed to enter the audio amplifier through this channel, and the set will be quiet in operation.

You will note that the type '27 detector tube has five prongs. Therefore, it will be necessary to mount a five-prong or UY socket in the set at the place where the four-prong UX detector socket was mounted.

## The Power Tube

In the last socket, we can use either a type '71 or a '15 tube. Since each of these tubes has a four-prong base, no change in the set socket will be necessary. Of course, if a push-pull amplifier is desired, an additional UX socket will have to be added, provided there is room in the set. It is necessary to take into account the fact that use of a push-pull amplifier requires replacing the second audio transformer with an input push-pull transformer; a push-pull output transformer will also be required. We will go more into detail with this later.

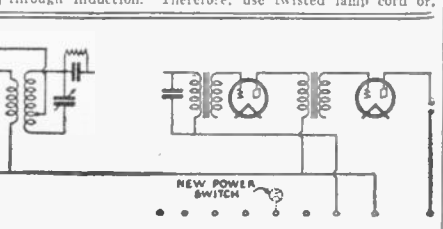
Suppose, for the present, we select a single type '15 tube for the power stage. This tube will give sufficient volume for dynamic speaker operation. Then we will need for the complete set the following tubes:

- Three type '26 tubes.
- One type '27 tube.
- One type '15 tube.

## Replacing the Filament Circuit

When replacing the filament wires, in place of two filament binding posts, as in the battery sets, we will need six; two for the type '26 tubes; two for the type '27 tube; and two for the type '15 tubes. This means that you should add four more "A" battery binding posts to the set chassis; or use long flexible leads, as you wish.

In A. C. sets, all A. C. wiring should be twisted—so that the electric field of one wire will be neutralized by that of the other and prevent any possibility of hum through induction. Therefore, use twisted lamp cord or,



preferably a twisted pair of smaller well-insulated wire. With this, connect the R. F. amplifier and first audio amplifier ('26) tube filaments in parallel, bringing the leads to one pair of binding posts. Run another pair of twisted leads to the heater terminals on the detector socket; and a third pair to the power-tube socket, connecting them with the other two pairs of binding posts. Then our circuit will be as shown in Fig. 4.

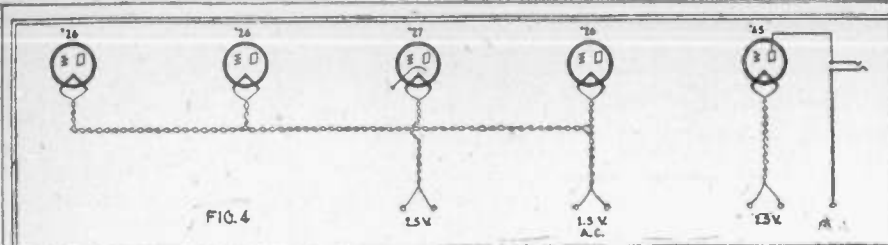


FIG. 4

## Changes in Grid or "C"-Bias Circuit

In the electric set, no "C" batteries are employed; the necessary bias voltages for the different grids are obtained from the difference in potential across a resistance through which the plate current of the tube or tubes flow. If we know the plate current and the grid voltage desired, we can easily calculate the value of the resistance by means of Ohm's law. The calculation is very simple. Characteristics of tubes are given in many books on the subject and are also printed on the circular that accompanies the tube. For example, a type '45 tube with a plate voltage of 250 should have a grid bias of 50 volts. In this case the plate current will be 32 milliamperes, according to the tube tables. Ohm's law says that

$$\text{Resistance} = \frac{\text{current}}{\text{voltage}}$$

Substituting our values in the formula we have

$$\text{Resistance} = \frac{50}{.032} \text{ or } 1562 \text{ ohms.}$$

A 1500-ohm resistor would be suitable. Note that 32 milliamperes is equal to .032 amperes, which value is used in the formula. The wattage equals the current multiplied by the voltage or, in this case, .032 times 50 or 1.6 watts. Therefore, a 1500-ohm, 2-watt resistor would be suitable.

Tube	Plate volts	"C" Bias Res. Ohms	Wattage
'71A	135	1500	0.5
	180	2000	1
'26	90	1500	0.1
	135	1500	0.1
'27	90	2000	0.1
	135	2000	0.1
'45	180	1500	1
	250	1500	2
'10	350	2000	0.5
	425	2000	1
'50	400	1500	5
	450	1500	5

For push-pull circuits, use resistors of half the resistance values above, but of twice the wattage. In this case, a single resistor is used to bias two tubes, and twice the amount of current passes through it. It is advisable, however, to use wattages in all cases of two to three times the above ratings, especially if the resistors are to be placed inside of a cabinet where there is little ventilation.

Where one resistor is used to bias two or more tubes, as is sometimes done with R. F. amplifiers, for two tubes use half the resistance that is required for one; a third for three tubes, etc. The wattage increases proportionally to the number of tubes. The Service Man should always have on hand an assortment of resistors for making repairs and replacements.

Many battery sets employ special binding posts for "C" battery connections. In these cases, the "F" terminals of the audio transformer secondaries connect to these "C" posts. In the electrified sets, the "F" leads of the transformers are removed from the "C" posts and connected to "H"—in accordance with the diagram of Fig. 5.

A 1500-ohm "C" bias resistor for the type '45 power tube can be mounted in the set; although in some cases it is placed in the power pack. We will place it in the set, however, in the position shown at R4 in Fig. 3.

It must be by-passed by a condenser C4 of at least 1 mf. capacity. Since the voltage across the resistor is only 50, a low-voltage paper condenser is suitable—one rated up to 200 volts. Since the exact output voltage of the power pack will be uncertain, it is well to make the resistor R4 variable, and use one having a range of 0 to 3000 ohms. This can be mounted on the sub-panel, since it need be adjusted only once.

A center-tapped resistor R5, to be connected across the power tube's filament, is also required. This is a standard resistor, of about 20 ohms. The grid return or "F" post of T2, the second audio transformer, is connected as shown, completing the power tube bias.

The "C" bias for the R. F. and first stage audio amplifier is obtained by means of another resistor, R6 (Fig. 5). Since type '26 tubes are used for the R. F. and first audio amplifier at the same plate voltage of 90, one resistor is sufficient. The value of this may be calculated in the same manner. At 90 volts, the grid bias of a '26 tube should be 6 volts, and the plate current, if the tube is good, will be close to 3.8 milliamperes. Since there are three of these tubes the total plate current flowing through the resistor will be three times 3.8 or 11.4 milliamperes, which is .0114-ampere. Therefore, in our formula we have

$$\text{Resistance} = \frac{6}{.0114} \text{ or } 526 \text{ ohms.}$$

A 500 ohm resistor would be suitable, and the wattage would be .0114 times 6, or .0684 watts. At least a 1/10-watt resistor should be used.

This resistor, R6, is connected as shown, and a 1-mf. condenser C6 is placed across it as a by-pass. A 20-

ohm center tapped resistor, R8, is necessary also across the '26 filament circuit, as indicated. Note that all the "grid-return leads" of the '26 tubes are connected together and to one side of this resistor. This completes the grid-bias arrangement for these tubes.

These biasing resistors may be the small, flexible spaghetti-covered ones; as the wattage is low (1/10), and they will not get hot or burn out.

The detector, using a grid condenser and grid leak, requires no biasing voltage; consequently, its grid return is connected to the cathode terminal ("K") on the socket. This terminal also connects to the "B—" lead, as shown. Sometimes it is advisable to ground the "B—" lead through a large condenser, of at least 1 mf. capacity, as shown at C7 in Fig. 5.

Now the circuit is complete with the exception of the

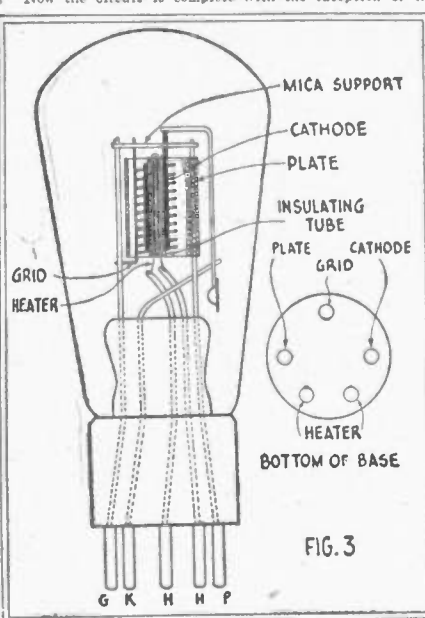


FIG. 3

volume control. Perhaps the most effective means of controlling the volume is by means of a series plate resistor, R9, connected in the plate-supply lead of the two R. F. amplifier tubes. This should be a variable resistor of about 50,000 to 100,000 ohms. This affects the "C" bias slightly, but not enough to cause any serious trouble. It should be mounted on the front panel, using the hole in the panel formerly filled by one of the filament rheostats; and by-passed by the 1-mf. condenser C9 connected, as shown, between the plate side of the volume-control resistor R9 and the "B—" side of the wiring. Another condenser, C10, of 1-mf. capacity, is to be recommended across the 90-volt "B" supply lead, and "B—".

The completed diagram, Fig. 5, shows the finished circuit. It is ready for the "power pack".

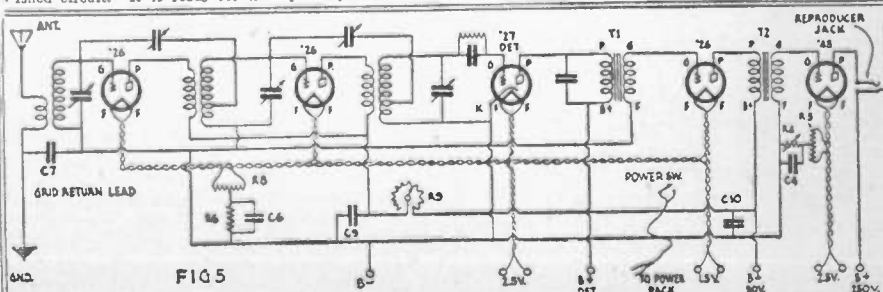


FIG. 5

## Circuit Using Type '27 Tubes

Before describing power packs for electric sets, it may be well to mention other methods for converting battery sets to power sets. For instance, type '27 tubes may be used throughout, with the exception of the power tube, and thereby quieter operation, as regards A. C. hum is obtained. Separate "C" bias resistors are also possible. A circuit diagram using these tubes is shown at Fig. 6. You will notice that this is similar to Fig. 5, except for the tubes and the values of the biasing resistors; these values are indicated on the diagram. The main change in the work of conversion is to replace all the sockets, excepting that of the power tube, with five-prong UY ones. This means a little more work; but better results are assured.

## A Push-Pull Amplifier

If you have room in the set for a push-pull amplifier and desire to have one, the circuit Fig. 7 may be employed for this stage. Either type '71A or type '45 tubes may be employed. Input and output push-pull transformers will be required, as indicated. For a type '71A push-pull amplifier with 180 volts plate potential, a "C" bias resistor of 1000 ohms should be used. For a type '45 push-pull amplifier with a 250-volt supply, a 750-ohm resistor should be used. (These values are obtained from the table.) The circuit of the set is otherwise as in Figs. 5 or 6.

## Replacing Audio Transformers

Many of the old battery sets employed small audio transformers, which were all right in their day when speakers of limited tonal range were used; but, for use with modern dynamic speakers, better transformers are recommended. Good audio transformers of modern make can now be obtained at a low cost and it is advisable to make the replacement. Simply remove one audio transformer at a time, remembering how the leads were connected, and replace it with a modern instrument, connected in the same way. The four terminals are clearly marked: "P," "B," "F" and "G".

## Phonograph Attachment

If you have no phonograph, a turntable driven by an electric motor can be obtained at small cost and, with a suitable pick-up, an excellent quality of reproduction can be obtained from the modernized battery set. There are various methods of connecting pick-ups, the circuits being furnished with these instruments. A simple way of connecting it into the circuit is by means of a "G" and "P" plug; and you can probably use the jack to fill one of the unnecessary excess holes in the panel.

## Screen-Grid Tubes

Unless the set is already designed for screen-grid tubes, it is not advisable to use them in the converted set; for they will necessitate too many changes, and an increase in sensitivity can not be warranted. Special R. F. transformers will be required; since these should be shielded, it will be difficult to make a satisfactory job where space is cramped.

## The Loud Speaker

Of course the old magnetic speaker may be used but, with a power tube and high voltage, an output transformer will be required to protect the speaker's winding. Some battery sets already have this transformer, in which case no change will be necessary.

A dynamic reproducer is to be recommended for it adds much to tone quality. The speaker incorporates an output transformer and no additional one will be required in the set. It is well to obtain a dynamic which contains a rectifier to supply it with field current directly from the A. C. lighting line. This complete unit will be the simplest to install, and will give the least trouble.

Of course, with a dynamic speaker, a baffle board or cabinet is essential. The speaker's field supply can be connected to the set side of the filament switch on the panel; so that the speaker's field current is turned on and off with the set.

## The Power Pack

The power pack has to supply the proper filament and plate voltages; and there are various means of obtaining this result. For example, a simple way would be to use a separate filament transformer for the tube filaments; one with a 2½ volt winding for the detector, a 1½-volt winding for the '26 tubes (all connected in parallel) and one 2½-volt winding for the '45 tube or tubes. Then a standard "B" eliminator, delivering up to 250 volts for the power tube, may be used. If a type '71A power tube is used instead of the '45, the only change necessary in the set will be the value of the "C"-bias resistor (which should be 2000 ohms instead of 1500) and then a standard 180-volt "B" eliminator may be employed.



With the '45 tube, it would be better to build a complete power pack; as it is a simple matter to select suitable transformers, filter condensers, choke coils and a voltage divider for the purpose. Maximum undistorted power output then may be obtained from the '45s.

## How to Choose the Power Transformer

In selecting a power transformer, be sure to pick out one that has the proper number of secondaries, and voltage high enough for the plate of the power tube or tubes. The ratings, as regards the number of tubes they will supply, are given with the transformers and, if the transformer will supply more tubes than you are using, so much the better; it will not be overloaded, and the set will always receive the correct voltages. With an overloaded transformer, the voltages to the set will be below normal, resulting in poor quality, fading, and lack of volume.

In our typical battery-to-electric set of Fig. 5, using a '45 tube, a 60- or 75-watt transformer is recommended, as it will deliver the correct amount of current. It can be used with a single or a push-pull '45 amplifier; and it has a sufficient number of filament-supply secondaries for the '26, '27, '45 and '80 (rectifier) tubes. The method of determining the transformer wattage will be described later.

The complete circuit of the power pack is shown in Fig. 8; this contains the following main items:

- (A)—Power transformer (D)—Voltage divider
- (B)—Filter chokes (E)—Rectifier
- (C)—Filter condensers

For the filter chokes, any pair of double-filter chokes as used in standard receivers solve our problem. These can easily be obtained at low cost. Select those designed for the power tube to be used.

The Majestic "245" or the RCA "600-volt" replacement condenser blocks make excellent filter condensers for the condenser bank.

A full-wave type '80 rectifier tube is recommended for the set described.

This leaves us with the voltage divider to supply, and the power pack is complete. The resistor values for this divider are indicated on the diagram, and good rugged high-voltage resistors must be used; for over-loaded units continually burn out.

## The Voltage Divider

In calculating current requirements of power packs, it is sufficient to estimate the voltage-divider, or "bleeder," current as 20 milliamperes. The wattage of a resistor is equal to  $I^2 R$  (current squared times resistance). Knowing the current and the resistance, we can easily calculate the wattage. For example, at 20 milliamperes the lower 4000-ohm section of the divider should have a wattage of  $.02 \times .02 \times 4000$  or 1.6 watts. A 2-watt resistor is recommended. The upper section, in addition to the 20 milliamperes drain, passes the additional current used by the tubes, which can be obtained from tube tables. In our converted 5-tube set, the three '26's and the one '27 draw about 14 milliamperes. This makes a total of 34 milliamperes passing through the upper 4000-ohm resistor. The wattage would be  $.034 \times .034 \times 4000$ , or 4.80 watts; a 5-watt resistor is recommended. The center 4000-ohm section may be a 3-watt component; as only slightly more current flows through it than through the lower section.

The voltage drop across the upper 4000-ohm resistor, at .034 amperes is equal to  $.034 \times 4000$ , or 134 volts. Subtracting this from the total of 250 volts, leaves 114 volts. But there will be a voltage drop across the choke coil, bringing it down to about the desired amount of 90, as marked on the diagram (Fig. 8).

Voltage dividers can be used in various resistance values; many of them are as high as 40,000 ohms. The disadvantage of high-ohmage dividers is that the set voltages fluctuate more as the set draws more or less current; this effect is sometimes caused by adjusting the volume control.

A low-ohmage voltage divider delivers a more steady voltage to the set, and is more practical. The disadvantage is the greater current wasted in "bleeder" (voltage-divider) resistance; which causes a greater drain on the rectifier tube, lowering the output voltage and increasing hum. This latter objection is removed by using larger filter condensers.

For experimental or replacement work, voltage dividers with sliding contacts may be used. This enables you to place the various contacts at the exact voltages desired—as measured with a meter. However, ordinary voltage dividers usually have sufficient contacts to give approximately the correct voltages.

## Selecting Power Transformers—Wattage Required

If we know the wattage of the set, it is a simple matter to pick out the correct power transformer, for:

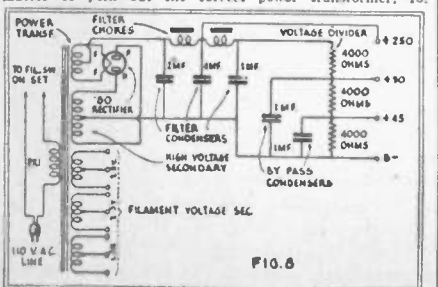


FIG. 6

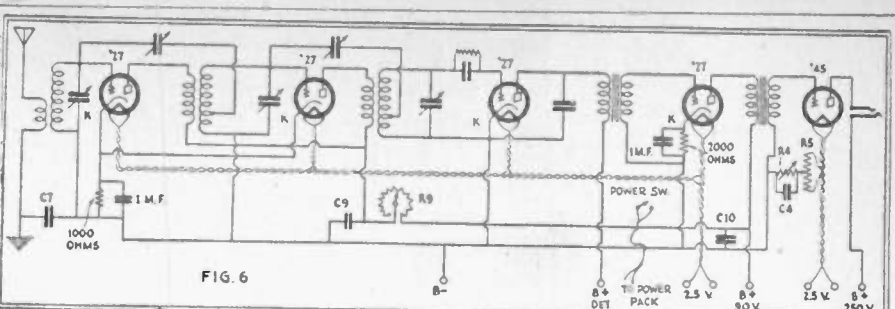


FIG. 6

replacements or in the design of a new set. Of course, in addition to knowing the wattage, we must also know the number and types of tubes; these can easily be counted and the types noted. To find the wattage, a little calculation is necessary; but we will go through the calculation here and put the results down in tabular form, so that they will always be handy and can be used for further reference and thereby avoid further figuring.

The first thing to determine is the wattage consumed by the various tube filaments. In a single tube, the wattage equals the voltage multiplied by the current (neglecting "power factor," which is not of sufficient importance in dealing with low-power apparatus). For example, the wattage of a type '71A tube filament is equal to 5 volts times 0.25 (ampere), or 1.25 watts. Making similar calculations for all the tubes (most likely to be used), we have the following table:

Type of Tube	Filament Watts
'24	4.375
'26	1.575
'27	4.375
'12A	1.25

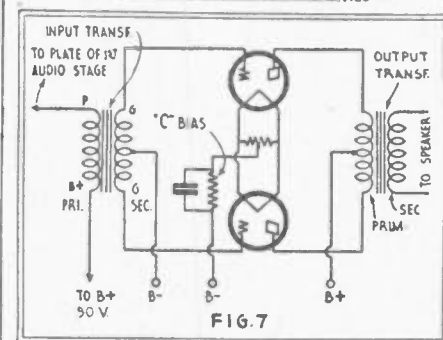


FIG. 7

'71A	1.25
'10	3.375
'45	3.75
'50	3.375

To find the total wattage used by the tube filaments in the set, add up the watts used by each filament. Thus, if the set has three '26's, one '27, and one '45, the total wattage will be:

$$3 \text{ times } 1.575 \text{ or } 4.725 \\ \text{plus } 4.375 \\ \text{plus } 3.75$$

total: 12.85 watts

This gives us a total of 12.85 watts for the filaments. To determine the remaining power used by the set, we have simply to add in the wattage consumed by the rectifier (both plate or plate and filament); for the rectifier supplies all the plate current for the set, as well as that lost in the voltage divider, voltage regulator, etc. The following table gives the rectifier ratings:

Tube	Filament and Plate watts (maximum rating)
'80	50
'81	65

Knowing these figures, if the set above described used a type '80 rectifier, the total wattage used by the entire set would be the rectifier wattage (12.81) plus the rectifier wattage (50) or:

$$12.85 \\ 50.00$$

$$62.85 \text{ watts}$$

A 60-watt transformer would be ample, since we have figured maximum ratings.

The wattage of the rectifiers is calculated by multiplying the rectifier A. C. voltage by the output current, and adding the filament wattage. Consequently this takes into consideration the wattage lost in the rectifier tube.

The wattage of the set above calculated is that of circuit Fig. 5. We found that a 60-watt transformer would suffice. Suppose we calculate the wattage of circuit of Fig. 6, in which '27's replace the '26's.

Four '27's @ 4.375 watts each	17.50
One '45	3.75
One '80	50.00

$$71.25$$

or a total of 71.25 watts. For this set, a 75-watt transformer should be used. You will note that center taps are shown on the filament windings; in our case we do not use them as we have center-tapped resistors in the set.

## Operation of the Set

If you have no measuring instruments for checking the various voltages, care should be taken in making the final tests. Be sure that all condensers are in good condition, and that those with high-voltage ratings are connected to the high-voltage output terminals of the power pack. After the current is turned on, it may be necessary to wait nearly one minute for the heater tube to warm up; after which the set is ready for operation.

Before making the test, be sure that the power tube's biasing resistor R4 is turned to the maximum resistance. This cuts the tube current down to a minimum, and no sound should come from the speaker. Now slowly adjust this resistance, gradually reducing it. A slight A. C. hum should now be heard. In this condition, you may tune in a station, and make a final adjustment of the resistor R4; leaving it where the best tone quality and least hum is obtained.

During this operation, the volume control R9 will not doubt have to be manipulated. If the set isn't properly neutralized, it will probably oscillate when the volume control is adjusted for loudest volume. Gradually reducing the volume will bring the setting to a critical point, just before oscillation, where it will be extremely sensitive and distant stations can be received. Excessive oscillation can be corrected by inserting 600-ohm "grid-suppressor" resistors in the grid leads; but it is unlikely that you will have to resort to this means.

Excessive A. C. hum can be eliminated by adding large capacity condensers—the more the better—to the filter in the power pack or between the "B plus" and "B minus" terminals of the set. Electrolytic condensers are ideal for this purpose. Grounding the power pack may help.

## How to Select and Install Replacement Parts in Standard Radio Sets

The Service Man will often be called to fix a set that has gone "dead." Usually some part of it has become damaged beyond repair, and a new part of the same rating is required. In many cases the correct part cannot be obtained—since that particular type of set may no longer be manufactured. Then the Service Man will have to pick out another part, of different manufacture, which can be obtained and will work just as well in the circuit. This is not always a simple task—especially when a diagram of the set is unavailable, and the values of the parts (such as condensers and resistors) are not marked.

Under these conditions an approximate rating may be obtained by noting the number and types of tubes in the set, and calculating the wattage, as described before. If a power transformer is burned out, this will enable him to select another one of suitable wattage; and the number and types of tubes will show how many windings and what secondary voltages are required. Then it is a simple matter to select another transformer that will deliver the required amount. The transformers are all rated by the wattage and the numbers and types of tubes they will supply. Transformers of rating higher than required may be used.

## The Filter Condensers

When a set goes "dead," it is not usually the power transformer that is burned out. Assuming that the trouble is in the power supply, which delivers no voltage to the set (as is usually the case), the first place to look for trouble is in the voltage divider, and the rectifier tube; then the plates of the rectifier become red hot after being turned on a few minutes. It is the condenser nearest the rectifier which receives the highest voltage and usually blows first (the 2-mf. capacity in Fig. 8).

This should be disconnected, and the set turned on without it. If the trouble was here, the set will now work but will have a hum. If not, try disconnecting each condenser until the faulty one is found. Then replace it with a new one, of any make, having a suitable voltage and capacity rating. The voltage rating is very important; as regards capacity, the higher the better. In this respect, electrolytic condensers, which have unusually high capacities for their physical size, are ideal for making replacements and clearing the hum out of noisy sets.

A supply of these electrolytic condensers should be part of the equipment of every Service Man; for their small size enables them to be placed in nearly all radio sets or power-supply systems.



Sometimes, when condensers are punctured, it is possible to purchase a complete electrolytic condenser bank suitable for the set in question. In this case, simply remove the old bank and replace it with the new one. Be sure of the ratings; or the new one may suffer a puncture. These condensers, however, are self-healing, if punctured, and will cause no more trouble.

### The Voltage Divider

Another source of trouble, likely to be found in the defective radio set, is an open voltage divider. If the lower end of the divider is open, unusually high voltages are placed on the set and, in turn, may puncture the filter condensers. Therefore, after replacing filter condensers in a set, quickly try the set or check the supply voltage to see that the divider is not open. Otherwise, the new condenser may be punctured.

Should this prove the case, it is best to install a complete new voltage divider. One with sliding contact is recommended, if the exact type formerly used in the set cannot be obtained. If there is any doubt as to the rating, always use a divider of higher wattage than is likely to be necessary. Knowing the type of power-supply system (that is, the type of rectifier tube and power

tubes in the set) a suitable divider can easily be obtained. A voltmeter should be used to check the various voltages. If one is not available, the divider contacts can be adjusted and left in the approximate positions where best set operation is obtained.

### The Choke Coils

Sometimes a choke coil will burn out. In this case, no voltage will be supplied to the set. When replacing choke coils, select one that is designed for the tubes used in the power amplifier of the set. Coils are rated accordingly, and one can easily be picked out.

### The Rectifier

Rectifier tubes don't last forever. It is always well, first, to try a new rectifier before making any changes or replacements in the circuit.

This covers practically all of the parts that are likely to need replacing. Of course, resistors and condensers in the set are likely to burn out or puncture; and they will need replacing. If a "C" bias resistor is open, the set may work for a few seconds, and then choke up or block. A simple way to test these resistors in the absence of measuring instruments, is temporarily to connect

another, about 1000 ohms, in parallel with the one under test, and note whether the set works any better. When the faulty one is found, replace it with one of the correct ohmage; calculated as previously described if necessary.

### Repairing "B" Eliminators

The same procedure should be followed as regards "B" eliminators as just described in connection with power-supply systems. Usually the first thing to go wrong is a filter condenser. However, to make sure, a new rectifier tube should first be placed in the eliminator. A gas-coat-type rectifier is usually employed in commercial eliminators.

If the eliminator delivers no voltage, disconnect each condenser, one at a time, and test the output voltage. Be sure that the line-current is turned off, when working on the instrument. If a defective condenser is located, the eliminator will work when it is disconnected; but there will be considerable A. C. hum. Therefore, be sure to replace the defective condenser with a good one. Also, check the resistors for continuity and correct values.

## Parts for Converting D.C. Receivers to A.C. using 171 Tube Output

Parts	Cat. No.	Your Price
1—Franklin power transformer	1410	\$3.00
1—Earl double choke	1864	1.00
1—2 mfd. condensers	1802	.45
1—4 mfd. condensers	1804	1.70
7—1 mfd. condensers	1701	3.50
1—Adjustable voltage divider	2275	.75
1—1500 ohm '71 A.C. bias resistor	2252	.35
1—20 ohm center tapped fil. resistor	2262	.15
1—250,000 ohm volume control	2251	.50
1—1000 ohm C bias	2251	.35
1—2000 ohm C bias (2nd audio)	2253	.35

1—U.Y. tube socket	1851	.07
1—Roll hook-up wire	1660	.18
1—Type '27 Neontron tube	602	.65
3—Type '26 Neontron tube	601	1.80
1—Type '71A Neontron tube	603	.65
<b>Total</b>		<b>\$15.55</b>

## Parts for Converting D.C. Receivers to A.C. using '45 Tube Output

Parts	Cat. No.	Your Price
1—Thordarson power transformer	1450	\$3.85
1—R.C.A. double choke	8336	.75
<b>Total</b>		<b>\$16.20</b>

## BRINGING YOUR SET UP-TO-DATE

**R**ADIO is constantly undergoing changes—changes for the better. Each year new sets appear on the market with new devices, circuits, and minor improvements of many kinds as the logical outcome of previous experience in set operation and design. This being the case, it is possible to take many sets made only a year ago and improve their performance or manipulation by adding present day features. The older the set is, the more it has to be improved. This very feature has netted many service men considerable business, but whether you are a service man, a hobbyist, or just a set owner, it is well to keep informed of all of the new improvements in radio and thoroughly understand them so that you can either improve your own set or know what to look for in exchanging it for a new one.

A study of the evolution of radio receiving sets shows that they follow closely in the path of development of the vacuum tube. Every time a new tube is produced, new circuits and sets appear using the new tubes. Present day sensitivity of modern receivers, for instance, followed largely upon the development of the screen grid tube. Thus, receiving circuits are being continually modified to conform with the latest developments in radio tubes.

The extreme sensitivity of the screen grid sets introduced new problems, however, the chief one of which, was selectivity. "Cross-talk" due to interference of powerful stations which modulated the weaker ones being received, introduced distortion and interference which could not be eliminated by the mere application of super-selective circuits. Hence, the advent of the variable-mu tube, which solved this problem and which once more modified receiving circuits and set design; and so on.

Since the publication of our last **RADIO SERVICE TREATISE**, several new tubes have appeared, each one of which has distinct characteristics which affect receiver design. These tubes are listed in the completely revised tube chart published in this issue. To aid radio service men and experimenters in using these tubes, or replacing older type tubes with them, they will be considered separately, and circuits showing their correct use will be given.

### The Type 235 Variable-Mu Tube

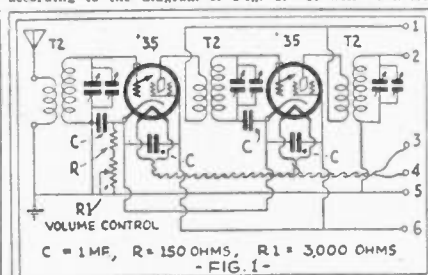
This tube is designed to take the place of the type 224 screen grid tube in radio frequency amplifiers. These tubes cannot be placed directly in the sockets of sets designed for type 224 tube operation, as the "C" bias is different, and the method of obtaining volume control in the circuit is different. However, any set can be easily converted for variable-mu tube operation, as will be described. But first let us point out the advantages of this tube.

The amplification factor of the variable-mu tube may be varied automatically or by a manually operated volume control. This method of control reduces cross-talk and cross-modulation interference from powerful local stations and thereby improves selectivity. In a receiver containing three or more stages of amplification using the ordinary screen grid tube, powerful local stations cannot be cut out because they have the effect of altering the tube's characteristic which in turn modulates the energy from the desired station and the unwanted station is carried through to the detector together with the desired one.

In the variable-mu tube, by altering its amplification factor, the straight portion of its characteristic curve can be lengthened considerably so that a powerful station will have no effect on the tube's characteristic and cannot interfere with the reception of the weaker stations.

The mutual conductance of the average 235 variable-mu tube, operating under a bias of 1.5 volts, is 1100, its plate resistance some 200,000 ohms, and the plate current 9 milliamperes, or about twice that of the 224. But, when the grid bias is raised to 40 volts, the mutual conductance of the tube is nominally 10 micromhos, or just one one-hundred-and-tenth (1/110) that obtained under ordinary conditions. This enormous range permits a multi-stage receiver to function under the most diverse conditions.

One can easily modify an old set, no matter how old or antiquated it is, for variable-mu tube operation. If the set is a battery type, it can be converted for A.C. operation by following the instructions published elsewhere in our catalogue. However, the instructions given herein should be sufficient without referring to the previous articles. In the first place, five-prong sockets should be used in the R.F. amplifier and wired according to the diagram of Fig. 1. It will be necessary



to use screen grid R.F. coils such as our Cat. No. 1667 coils because screen grid coils have larger primary windings than other kinds. The only other changes are in the "C" bias resistor and volume control. As shown in the diagram the volume control is connected in series with the bias resistor. Of course the values of the resistors depend upon the number of tubes which they control. With two tubes these values should be 150 ohms for R and 3000 ohms for R1, the volume control, and with three tubes they should be 100 ohms and 2000 ohms, respectively. Of course the resistor values can easily be calculated by means of Ohm's Law as outlined in our other articles.

Since these tubes are for A.C. operation the rest of the set should also be converted to A.C. operation. This necessitates the use of a power supply system which will be described later.

### Shielding

One of the most important considerations in making multi-stage R.F. amplifiers using screen grid tubes is shielding. While a two or three stage amplifier formerly worked fairly well with the type 201A tubes, with screen grid tubes in which considerably higher amplification is obtained, shielding is absolutely necessary; otherwise the set will oscillate making it impossible to realize the full amplifying power of the tubes.

Each stage should be thoroughly shielded. Just how shielding can be applied to a set which is unshielded depends entirely upon the set and the ingenuity of the builder. Aluminum shield cans are available in various sizes. It is probably best to

select cans nearest in size and cut them down if necessary. Condenser, coil and tube of each stage should be thoroughly protected by the shield, so that it will probably be necessary to procure aluminum sheets and cut to fit around the variable condensers, taking care not to short circuit any of the wiring.

### The Detector

Before continuing with a discussion of the newer type tubes, suppose we see what can be done in the way of improving the detector. Old battery sets usually employ a type 201A detector with a grid condenser and leak in the grid circuit. Others, using power detection use a "C" bias instead of the grid condenser and leak. Many of the earlier A.C. receivers employ the type 227 tube, either with a "C" bias or grid leak and condenser detection. Whether your set which you are converting is already A.C. or a battery operated one, a screen grid detector may be used advantageously to greatly improve its sensitivity. Furthermore, the screen grid detector works excellently when coupled to a pentode output tube—no extra audio amplification being necessary. Therefore, we will show a screen grid detector circuit in Fig. 2. Fig. 2, added to Fig. 1, makes an excellent combination up to and including the detector. These circuits are easily followed in converting older type sets.

The screen grid detector may be used with a grid condenser of .00025 mfd. and a grid leak of 2 megohms. Or it may be used as a biased detector with a plate voltage of 215 applied through a plate coupling resistor of 250,000 ohms or a 500-henry choke shunted by a 0.25-megohm resistor. The secondary winding of an old audio transformer makes an excellent choke for the plate circuit. This method is shown in the diagram of Fig. 2. In either case, the plate current should be adjusted to 0.1 milliamperes with no input signal using a negative bias of 5 volts.

The value of the "C" bias resistor would therefore be equal to 5 divided by .0001 or 50,000 ohms. The output of the detector is fed, by means of the plate coupling condenser C, to the input of the audio amplifier.

The pentode tube is finding wide application in modern receivers, especially of the midget and portable types, because of its large audio power output with relatively small signal voltage impressed on the grid. Thus a small set of three or four tubes now does the work which formerly required several. This is made possible by the addition of a "suppressor" grid in the internal construction of the pentode tube between the screen grid and the plate. The suppressor grid is connected inside the tube to the cathode and is therefore operated at the same potential as the cathode. When connected and operated in this manner, the suppressor grid is effective in eliminating practically all the secondary emission effects which limit the power output of the four-electrode screen grid tubes.

### Pentode Tubes

The pentode tube is finding wide application in modern receivers, especially of the midget and portable types, because of its large audio power output with relatively small signal voltage impressed on the grid. Thus a small set of three or four tubes now does the work which formerly required several. This is made possible by the addition of a "suppressor" grid in the internal construction of the pentode tube between the screen grid and the plate. The suppressor grid is connected inside the tube to the cathode and is therefore operated at the same potential as the cathode. When connected and operated in this manner, the suppressor grid is effective in eliminating practically all the secondary emission effects which limit the power output of the four-electrode screen grid tubes.



Next comes the type 224 screen grid detector of Fig. 2, with a plate voltage which may be the same, or 250, for convenience.

Then comes the pentode, type 247, operating on the same plate voltage, and coupled to the detector by the detector plate resistor and coupling condenser.

Thus we need only one plate supply voltage for the entire 4-tube set; one screen voltage, of 90; and one heater or heated-cathode voltage, of 6.3.

A power transformer with at least two separate 2½-volt filament windings, one for the pentode and one for the other tubes; although all can be lit from one winding.

## \$15.25

In selecting power transformers for various types of receiver circuits, it is well to keep in mind that the secondary filament windings may be connected in series or in parallel for obtaining special voltage and current ratings. For example, two type 50 tubes, each having a 15-volt filament, may be connected in series across a transformer having a 15-volt winding, provided that the current rating of the 15-volt winding is sufficient. In this case, the total supply is 30 volts.

Likewise, a type 71A tube may be operated from two 2.5 volt filament transformer windings connected in

FIG. 4

In the diagrams, leads 1 to 4 inclusive, all wires that are to be connected together have corresponding numbers. For example, all number fives should be connected together, all number 4's, etc. In Fig. 3 leads 9 to 10 go to the loud speaker. Many loud speakers have an output transformer connected and mounted within them, in which case 9 and 10 would connect to the input leads of this transformer. For speakers having no transformer, an output transformer should be obtained. It is assumed that the dynamic loud speaker will be used with the set, as only this type of speaker will give the full tone which the set is capable of producing. An output transformer with a low impedance secondary for connection directly to the voice coil of the speaker should be used, such as the No. 1418.

Many dynamic speakers have 2500-ohm field windings, which are suitable for use as filter chokes in the power supply system from which they draw their current. In this case the filter choke coil windings of Fig. 1 can be connected in parallel between condensers C1 and the speaker field coil connected as a choke between condensers C3 and C4.

## Fig. 5

5  
These tubes have a 6.3 volt filament, and while designed primarily for use in automobile receivers, they are especially desirable for D.C. line receivers.

The type '36 is a screen grid receiver for use in R.F. amplifiers; the type '37 a generators; the type '38 a purpose tube for use as detector; and the type '39 a pentode output tube. All of these are of the heater type and have the same heater current rating of .3 amperes. Thus, when all tube heaters are connected in series and the whole connected in series with a resistor and operated on 110-volts, the total current is .3 amperes, which is relatively small, and the total filament watts absorbed are about 33.

Since the maximum plate voltage cannot exceed the line voltage of 110, the output is somewhat limited. To compensate for this, it is customary to operate

two output pentodes, type '38, in parallel. This has the further advantage of more correctly matching the impedance of the average loud speaker.

Rather than go into detail about the construction or converting of a set into a 110 volt D.C. one, we show in Fig. 5 a complete diagram, with all values given. By following this and also the general directions given for A.C. receivers, the reader will have no difficulty in correctly wiring the set for D.C. operation.

The types '30, '31 and '32 tubes with 2-volt filaments for battery operation are also somewhat unpopular, as compared with the type '69 which was so popular in Radiola receivers. We do not advise the changing over of old Radiolas for using the 2-volt tubes. In the first place, the working space is limited; and in the second place, these new tubes have greater amplification factors and the old unshielded sets are not suited for their use. The set will generate uncontrollable oscillations. The late type '33 pentode, having a 2-volt filament, has appeared. This is the type '33 pentode, having a 2-volt, .26 ampere filament. Battery sets using the 2-volt tubes can be changed for using the pentode. Simply follow the general procedure as outlined in the case of the type '47 tube shown in Fig. 3. The type '38 tube should be operated on a plate voltage of 155 and should have a 150 ohm grid leak. This means that the plate load resistor should have a value of 800 ohms. Note that the screen voltage on pentodes is the same as the plate voltage.

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# VACUUM TUBE TREATISE

## The Grid

The grid in a three electrode tube allows the flow of electrons from filament to plate to be controlled. The electrons are negative charges of electricity, and are "like charges repel," and "unlike charges attract," by making the potential of the grid negative it will repel electrons, preventing many from reaching the plate; by making the grid positive electrons will be attracted, assisting many to reach the plate. If made sufficiently negative no electrons can get as far as the grid, and therefore none reach the plate. If made positive many electrons pass right through the meshes of the grid and move on to the plate.

## Characteristic Curves

A curve produced by plotting the value of plate current while the voltage of the grid is altered is called a characteristic curve.

The actual values of plate voltage and grid bias (C battery) voltage which are used, depend upon the type of tube, and the use to which it is being placed. The three electrode tube has many uses, and these usually require different values of voltage if the best results are to be obtained.

## Tube Factors.

There are two main primary factors which determine the performance of a tube:

1. Amplification factor.
  2. Impedance (A.C. resistance).
- There is also a third factor which is in some ways even more important, and which is a combination of these two. It is called the mutual conductance of the tube.

## Amplification Factor

A greater plate voltage draws more plate current through the tube, but a slightly greater value of negative grid bias will bring the plate current down to its original value. The ratio between the amount of extra grid bias necessary to counteract the extra attractive force and the increased plate voltage, is called the amplification factor.

$$\text{Amplification factor} = \frac{\text{Increase of plate volts}}{\text{Increase of grid bias volts}} \quad (\text{for same plate current})$$

## Impedance (or A.C. Res.)

The working (A.C.) resistance of a tube is not found by Ohm's law of:

$$\text{Resistance} = \frac{\text{Volts}}{\text{Amps}}, \text{ but by}$$

$$\text{Resistance} = \frac{\text{Increase in plate volts}}{\text{Increase of plate current}}$$

As the plate current is in milliamperes, the formula becomes:

$$\text{AC Resistance in ohms} = \frac{\text{Increase in plate volts} \times 1000}{\text{Increase in Milliamperes}}$$

## Mutual Conductance

For most purposes, the "goodness" of a tube is roughly proportional to the ratio of the amplification factor to the impedance. This ratio is called the mutual conductance.

$$\text{Mutual conductance} = \frac{\text{Amplification factor}}{\text{No. of thousands of ohms resistance.}}$$

In tubes of any given type, an increase of amplification factor (e.g., by increasing the fineness of mesh of the grid) is accompanied by a corresponding increase in impedance, so that the conductance is practically unchanged. An improvement in conductance generally involves a considerable re-design of a tube.

Regarding the matter from a different angle, the figure given as the mutual conductance states by how many microamps the plate current will vary, as the grid bias is altered one volt.

## Inside the Filament

When the tungsten filament of a vacuum tube is heated to the required temperature, the embedded thorium particles are diffused to the surface which they cover with a layer of thinness measured in atoms. The clusters of electrons (given off by the thorium) are then virtually plucked off by the attraction of the (positive) plate; but other electrons immediately take their place on the surface. There is a critical temperature at which the filament operates with the greatest efficiency; and at this the thorium particles are diffused to the surface just fast enough to keep the latter properly covered.

If the temperature is too low, there is not a sufficient flow of electrons; and if the temperature is too high, the thorium is "burned off" (evaporates) from the filament faster than it can diffuse to the surface. The first condition results in low efficiency, while the second causes a "de-activation" of the filament, ending in a marked decrease in current flow from filament to plate. There is still another effect from the second condition: the filament's crystalline structure is altered, greatly reducing the life of the tube.

In the case of the heater type of tube, the excessive heat soon burns the active coat from the cathode, and shortens the life of the tube; while the filament which heats the cathode cylinder is subject to the same changes as the other types of filaments.

Thus it is seen that filament temperature is one of the most important factors in tube life.

## "C" Bias and Tube Life

In a power tube, such as the 71A or the 45, if the grid-bias resistor is short-circuited or the "C" battery removed from the circuit, the plate current increases enormously; and in some cases the extra heat produced by this increase is sufficient to permanently injure the tube in a comparatively short time.

There is another effect of incorrect "C" bias. The modern set usually draws all of its plate current from a single rectifier tube (usually one of the '80 type) and, as these tubes are often operated at very nearly their maximum current, the increase of the current flow in the power-tube circuit often causes failure of the rectifier.

## Undistorted Output

The maximum undistorted power output from a vacuum tube is obtained when the LOAD resistance is equal to twice the PLATE resistance.

## The Special Detector

The special detector tube known as the 200A or 500A type is designed to be used exclusively as a detector, and is peculiar in the fact that, instead of a high vacuum being used, the tube is filled with a gas. The tube is more sensitive to weak signals than the 61A type, but, in order to obtain the greatest success, several changes must be made in the connections of the detector circuit. The grid resistor, which is ordinarily made to the positive side of the filament (when a grid leak and condenser are used) is changed to the negative side for this tube.

Due to the gas content of this tube, it must be operated with a low plate voltage; it is advised that one of less than 45 be used.

## The "High-Mu" Tube

The "high-mu" tube, known as the 40 and similar designations, was developed especially for impedance- and resistance-coupled amplifiers. It is found that the tubes also make a very good detector, especially when followed by a resistance- or impedance-coupled amplifier. The plate and grid coupling resistors for this tube are somewhat different from those of the 201A.

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tube in a resistance-coupled amplifier. The plate resistor should have a value of 250,000 ohms, and the grid resistor one from 50,000 to 75,000 ohms.

When used as a detector, the grid return should be tried on both the positive and negative terminals; although the best results are usually obtained with the negative connection.

## The Screen-Grid Tube

When constructing a set to use this tube, several precautions must be followed. It is not necessary to use any neutralizing or stabilizing devices with a screen-grid tube, since the capacity which allowed the set to oscillate is reduced to a very low value. However, in order to prevent a feedback through some other source, such as interstage coupling between the coils and wiring, it is necessary to use extreme precaution in shielding each stage from the others. Because of the high plate resistance, a high impedance must be used in the plate circuit in order to maintain the high an filiation. This necessitates the use of special coupling coils with very large primary windings or the employment of tuned-impedance coupling.

## The A.C. Screen-Grid Tube

In order to obtain stable operation in circuits designed to give maximum gain per stage it is necessary to use shielding to separate the input from the output circuits. The internal construction of the tube makes it unnecessary to use the neutralizing providing external couplings are eliminated by correct shielding. The need of plenty of shielding to separate the coils, tubes, condensers and chokes cannot be emphasized too much. A single flaw in the isolation of the various circuits will often result in complete failure of the set. The screen-grid voltage may be varied to control the volume.

The 21 tube is an excellent bias detector either with small or large signal inputs. When small R.F. inputs are obtained, the screen grid voltage should be kept at 35 to 45 volts and the control-grid at minus 3.5 or 4.5 volts. The output in this condition feeding into frequency input modulated 29%. This handling value is more than sufficient to operate a 45 at full output with direct coupling or two 45 tubes in push-pull with a low-gain audio transformer.

## Mutual Conductance

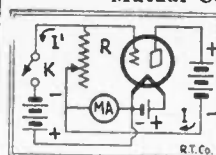
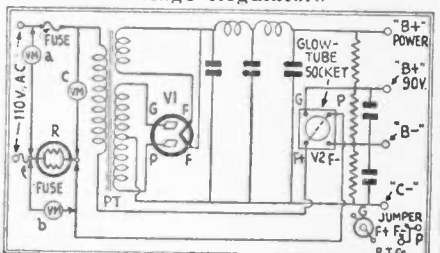


Fig. 1  
This circuit makes it possible to test quickly individual tubes to determine their mutual conductance, the best index to their quality.

Between tubes of the same type, the mutual conductance increases with the plate current, and, therefore, a high "Gm" indicates that its filament emission is very good. The mutual conductance of a tube. It will be remembered, is the ratio of the amplification factor to the plate resistance. (The amplification factor is conveniently first multiplied by one million, to obtain the rating in micromhos instead of mhos.) If either of these two values is abnormal, the mutual-conductance reading will show that something is wrong. Any misplacement of the tube, a high leakage-current, will all be shown in a mutual-conductance test.

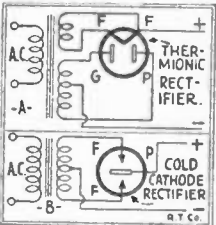
## Voltage Regulators



The ordinary arrangement of a power unit with a voltage-regulator tube V2 across the secondary of a ballast tube R in the circuit of its special power transformer. The jumper at the lower right connects two prongs of the glow-tube V2, and automatically breaks the power input when this tube is out of its socket. These tubes fall into two classes: The first is the D.C. output-voltage regulator or "glow" tube; and the other is the A.C. line-voltage regulator, or "Ballast" tube.

The glow-tube is made for service in "B" power units and insures proper voltage regulation of the D.C. output voltages. In addition to the voltage-stabilizing effect, the tube is equivalent to an extra filter condenser across the output; thus reducing the possibility of "motorboating" or other interstage-coupling effects in the receiver, and also tending to reduce the hum. Its effect has been compared to that of a 20-mf. condenser connected at the same position in the circuit.

## Rectifier Tubes

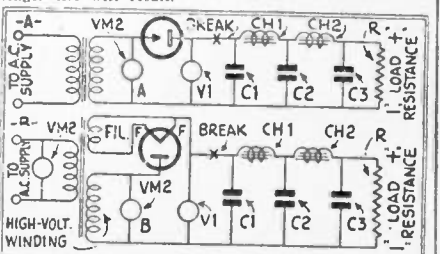


The operation of any rectifier depends on its "unilateral conductivity," this formidable expression means only that it lets currents pass through it in but one direction.

At A, the connections to the power equipment which result when a type '80 tube is plugged into the socket; at B, those resulting when a "cold-cathode" rectifier is similarly plugged into the receptacle for "full-wave" rectification.

When the output from the rectifier must be extremely steady, as in the case of an "A" or "B" power unit, it is much better to use the full-wave system than the half-wave arrangement, because of the greater ease in filtering the rectifier output.

If the set constructor or designer uses more care to be sure that he is not overtaxing the rectifier tubes, longer life will result.



To test the operation of a rectifier tube disconnect the positive side of the tube from the filter system, as shown at X; this is conveniently done with a special plug in the rectifier socket. Ready tests are then taken across the tube with the A.C. voltmeter VM2 and D.C. voltmeter V1, to show its action under no load.



# 1932-RCA RADOTRON CHARACTERISTICS CHART-1932.

## DETECTORS AND AMPLIFIERS

TYPE	PURPOSE	BASE	DIMENSIONS MAX. OVERALL		CATHODE TYPE	RATING				PLATE SUPPLY VOLTS	NEGATIVE GRID BIAS VOLTS		SCREEN VOLTS	PLATE CURRENT MILLI- AMP.	A C PLATE RESIS- TANCE OHMS	MUTUAL CON- DUCTANCE MICRO- MHOS	VOLTAGE AMPLIFI- CATION FACTOR	OHMS LOAD FOR STATED POWER OUTPUT	POWER OUT- PUT MILLI- WATTS	
			FILAMENT (OR HEATER)			PLATE MAX. VOLTS	D C ON FIL.	A C ON FIL.												
			LENGTH	DIAM.					VOLTS		AMPERES	SUPPLY								
WD-11	DETECTOR * or AMPLIFIER	WD-11	4 1/4"	1 1/8"	FILAMENT	1.1	0.25	D C	135	—	90	4.5 10.5	—	2.5 3.0	15500 15000	425 440	6.6 6.6	15500 18000	7 35	
WX-12	DETECTOR * or AMPLIFIER	UX	4 1/4"	1 1/8"	FILAMENT	1.1	0.25	D C	135	—	90	4.5 10.5	—	2.5 3.0	15500 15000	425 440	6.6 6.6	15500 18000	7 35	
UX-112-A	DETECTOR * or AMPLIFIER	UX	4 1/4"	1 1/2"	FILAMENT	5.0	0.25	D C	180	—	90	4.5 9.0	—	5.2 6.2	5600 5300	1500 1600	8.5 8.5	5600 8700	30 115	
UV-199	DETECTOR * or AMPLIFIER	UV-199	3 1/4"	1 1/8"	FILAMENT	3.3	0.063	D C	90	—	90	4.5	—	2.5	15500	425	6.6	15500	7	
UX-199	DETECTOR * or AMPLIFIER	UX	4 1/4"	1 1/8"	FILAMENT	3.3	0.06	D C	90	—	90	4.5	—	2.5	15500	425	6.6	15500	7	
UX-200-A	DETECTOR	UX	4 1/4"	1 1/8"	FILAMENT	5.0	0.25	D C	45	—	45	Grid Return to (-) Filament	—	1.5	30000	666	20	—	—	
UX-201-A	DETECTOR * or AMPLIFIER	UX	4 1/4"	1 1/8"	FILAMENT	5.0	0.25	D C	135	—	90	4.5 9.0	—	2.5 3.0	11000 10000	725 800	8.0 8.0	11000 20000	15 55	
UX-222	RADIO FREQ. AMPLIFIER	UX	5 1/4"	1 1/8"	FILAMENT	3.3	0.132	D C	135	67.5	135	1.5	—	45 67.5	1.5 3.3	850000 600000	350 480	300 290	—	
UX-222	AUDIO FREQ. AMPLIFIER	UX	5 1/4"	1 1/8"	FILAMENT	3.3	0.132	D C	135	67.5	120†	1.5	—	22.5	0.3	2000000	175	350	—	
UY-224	RADIO FREQ. AMPLIFIER	UY	5 1/4"	1 1/8"	HEATER	2.5	1.75	A C or D C	275	90	180 180 250	1.5 3.0 3.0	1.5 3.0 3.0	75 90 90	4.0 4.0 4.0	400000 400000 600000	1050 1000 1025	420 400 615	—	
UY-224	BIASED DETECTOR	UY	5 1/4"	1 1/8"	HEATER	2.5	1.75	A C or D C	275	90	275‡	5 approx.	5 approx.	20 to 45	Plate Current to be adjusted to 0.1 ma. with no Input Signal					
UY-224	AUDIO FREQ. AMPLIFIER	UY	5 1/4"	1 1/8"	HEATER	2.5	1.75	A C or D C	275	90	250*	1.0	1.0	25	0.5	2000000	500	1000	—	
UX-226	AMPLIFIER	UX	4 1/4"	1 1/8"	FILAMENT	1.5	1.05	A C or D C	180	—	90 135 100	6.0 8.0 12.5	6.0 9.0 13.5	—	3.8 6.3 7.4	6000 7200 7000	955 1135 1170	8.2 8.2 8.2	9800 8800 10500	30 80 180
UY-227	DETECTOR * or AMPLIFIER	UY	4 1/4"	1 1/2"	HEATER	2.5	1.75	A C or D C	275	—	90 135 180 250	6.0 9.0 13.5 21.0	6.0 9.0 13.5 21.0	—	2.7 4.5 5.0 5.2	11000 9000 9000 9250	820 1000 1000 975	9.0 9.0 9.0 9.0	14000 13000 18700 34000	30 80 165 300
UY-227	BIASED DETECTOR	UY	4 1/4"	1 1/2"	HEATER	2.5	1.75	A C or D C	275	—	275	30.0 approx.	30.0 approx.	—	Plate Current to be adjusted to 0.2 ma. with no Input Signal					
RCA-230	DETECTOR * or AMPLIFIER	UX	4 1/4"	1 1/8"	FILAMENT	2.0	0.06	D C	90	—	90	1.5	—	—	1.8	13000	700	9.3	15000	16
RCA-232	RADIO FREQ. AMPLIFIER	UX	5 1/4"	1 1/8"	FILAMENT	2.0	0.06	D C	150	67.5	135	3.0	—	67.5	1.4	1150000	505	580	—	
RCA-232	BIASED DETECTOR	UX	5 1/4"	1 1/8"	FILAMENT	2.0	0.06	D C	150	67.5	174‡	6 approx.	—	67.5	Plate Current to be adjusted to 0.2 ma. with no Input Signal					
RCA-232	AUDIO FREQ. AMPLIFIER	UX	5 1/4"	1 1/8"	FILAMENT	2.0	0.06	D C	150	67.5	180†	1.0	—	22.5	0.25	—	—	—	—	
RCA-235	RADIO FREQ. AMPLIFIER	UY	5 1/4"	1 1/8"	HEATER	2.5	1.75	A C or D C	275	90	180 250	1.5 3.0	1.5 3.0	75 5	5.8 6.5	350000 350000	1100 1050	385 370	—	
RCA-236	RADIO FREQ. AMPLIFIER	UY	4 1/4"	1 1/8"	HEATER	6.3	0.3	D C	135	75	90 135	1.5 1.5	—	55 67.5	1.8 3.0	200000 300000	850 1050	170 315	—	
RCA-237	DETECTOR * or AMPLIFIER	UY	4 1/4"	1 1/8"	HEATER	6.3	0.3	D C	135	—	90 135	6.0 9.0	—	—	2.6 4.3	11500 10000	780 900	9.0 9.0	17500 14000	30 80
UX-240	VOLTAGE AMPLIFIER	UX	4 1/4"	1 1/2"	FILAMENT	5.0	0.25	D C	180	—	135† 180†	1.5 3.0	—	—	0.2 0.2	150000 150000	200 200	30 30	—	

\*For Grid-leak Detection—plate volts 45, grid return to + filament or to cathode.  
†Applied through plate coupling resistor of 250000 ohms.  
\*Applied through plate coupling resistor of 200000 ohms.

‡Applied through plate coupling resistor of 50000 ohms.  
§Applied through plate coupling resistor of 250000 ohms or 500 henry choke shunted by 0.25 megohm resistor.  
\*Applied through plate coupling resistor of 100000 ohms.

## POWER AMPLIFIERS

UX-112-A	POWER AMPLIFIER	UX	4 1/4"	1 1/8"	FILAMENT	5.0	0.25	A C or D C	180	135	9.0	11.5	6.2	5300	1600	8.5	8700	115
UX-120	POWER AMPLIFIER	UX	4 1/4"	1 1/8"	FILAMENT	3.3	0.132	D C	135	90	16.5	—	3.0	8000	415	3.3	9600	45
UX-171-A	POWER AMPLIFIER	UX	4 1/4"	1 1/8"	FILAMENT	5.0	0.25	A C or D C	180	135	22.5	—	6.5	6300	525	3.3	6500	110
UX-210	POWER AMPLIFIER	UX	5 1/4"	2 1/8"	FILAMENT	7.5	1.25	A C or D C	425	90	16.5	19.0	12.0	2250	1330	3.0	3200	125
RCA-231	POWER AMPLIFIER	UX	4 1/4"	1 1/8"	FILAMENT	2.0	0.130	D C	135	135	27.0	29.5	17.5	1960	1520	3.0	3500	370
RCA-233	POWER AMPLIFIER	UY	4 1/4"	1 1/8"	FILAMENT	2.0	0.26	D C	135	135	40.5	43.0	20.0	1850	1620	3.0	5350	700
RCA-238	POWER AMPLIFIER	UY	4 1/4"	1 1/8"	HEATER	6.3	0.3	D C	135	135	35.0	39.0	18.0	6000	1330	8.0	13000	400
UX-245	POWER AMPLIFIER	UX	5 1/4"	2 1/8"	FILAMENT	2.5	1.5	A C or D C	275	250	27.0	31.0	34.0	5150	1550	8.0	11000	900
RCA-247	POWER AMPLIFIER	UY	5 1/4"	2 1/8"	FILAMENT	2.5	1.75	A C or D C	250	250	48.5	50.0	36.0	5000	1600	8.0	10200	1600
UX-250	POWER AMPLIFIER	UX	6 1/4"	2 1/8"	FILAMENT	7.5	1.25	A C or D C	450	250	54.5	56.0	27.0	1900	1850	3.5	3500	780

\*Screen Current 3.5 Milliamperes. \*\*Screen Current 2.5 Milliamperes. \*\*\*Screen Current 7.5 Milliamperes.

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## RECTIFIERS

UX-280	FULL-WAVE RECTIFIER	UX	5½"	2½"	FILAMENT	5 0	2 0	A C	1 A C Voltage per Plate (Volts RMS) ..... 350 D C Output Current (Maximum MA.) ..... 125 2 A C Voltage per Plate (Maximum Volts RMS) ..... 400 D C Output Current (Maximum MA.) ..... 110 3 A C Voltage per Plate (Maximum Volts RMS) ..... 550 D C Output Current (Maximum MA.) ..... 135 (This rating is permissible only with filter circuits having an input choke of at least 20 henries.	For d-c output voltage delivered to filter of typical rectifier circuit, refer to curves in Technical Bulletin.
UX-281	HALF-WAVE RECTIFIER	UX	6½"	2½"	FILAMENT	7 5	1 25	A C	A C Plate Voltage (Maximum Volts RMS) ..... 700 D C Output Current (Maximum MA.) ..... 85	For d-c output voltage delivered to filter of typical rectifier circuit, refer to curves in Technical Bulletin.

## REGULATORS

UX-874	VOLTAGE REGULATOR	UX	5½"	2½"		Designed to keep output voltage of B-Eliminators constant when different values of "B" current are supplied.			Operating Voltage ..... 90 Volts D C Starting Voltage ..... 115 Volts D C Operating Current ..... 10-20 Milliamperes
UV-876	CURRENT REGULATOR (Ballast Tube)	Mogul	8"	2½"		Designed to insure constant input to power operated radio receivers despite fluctuations in line voltage.			Operating Current ..... 1.7 Amperes Voltage Range ..... 40-60 Volts
UV-886	CURRENT REGULATOR (Ballast Tube)	Mogul	8"	2½"		Designed to insure constant input to power operated radio receivers despite fluctuations in line voltage.			Operating Current ..... 2.85 Amperes Voltage Range ..... 40-60 Volts

## TYPES FOR AMATEUR AND EXPERIMENTAL RADIO USES

TYPE	PURPOSE	BASE	DIMENSIONS MAXIMUM OVERALL		CATHODE TYPE	FILAMENT			NOR- MAL PLATE VOLTS	VOLT- AGE AMPLI- FICA- TION FACTOR	NEGATIVE GRID BIAS		SCREEN VOLTAGE		PLATE CURRENT		PLATE DISSIPATION		POWER OUTPUT		
			LENGTH	DIAM.		VOLTS	AMPS.	SUPPLY			CLASS B APPROX- IMATE VOLTS	CLASS C APPROX- IMATE VOLTS	CLASS B APPROX- IMATE VOLTS	CLASS C APPROX- IMATE VOLTS	CLASS B MAXI- MUM MA.	CLASS C MAXI- MUM MA.	CLASS B MAXI- MUM WATTS	CLASS C MAXI- MUM WATTS	CLASS B PEAK WATTS	CLASS C CAR- RIER WATTS	CLASS C WATT
UX-852	OSCILLATOR or R. F. POWER AMPLIFIER	UX	8½"	6½"	FILAMENT	10.0	3.25	A C	2000	12	150	250	—	—	85	100	100	100	120	30	100
UX-865	OSCILLATOR or R. F. POWER AMPLIFIER	UX	6½"	2½"	FILAMENT	7.5	2.0	A C	500	150	40	75	125	125	30	60	15	15	7.5	1.9	7.5
RCA-866	HALF-WAVE RECTIFIER	UX	6½"	2½"	FILAMENT	2.5	5.0				Maximum Peak Inverse Voltage... 7500 Volts Maximum Peak Plate Current ..... 0.6 Ampere Approximate Tube Voltage Drop ..... 15 Volts										

## HOW TO TAKE CARE OF YOUR TUBES\*

(1) Keep the prongs of the tubes clean in order to assure good contact. The contact springs of the sockets should also be cleaned.  
 (2) Use the correct filament voltage at all times; it is a good plan to run the tubes at about three-quarters of their rated voltage, if the quality is not greatly affected in this way.  
 (3) The correct "C" bias (for the "B" potential applied) must always be supplied to every tube; incorrect "C" voltages will cause distortion.  
 (4) The correct "B" voltages must be applied; if lower voltages are used, you will not get the correct volume or quality. If a "B" power unit is used, be sure that it is capable of delivering sufficient voltage to the plates of the tubes. If variable voltage con-

trols are provided, it is a good plan to check the output of the unit with a high-resistance voltmeter.  
 (5) Always use the tubes for the purpose specified by the manufacturer. The use of tubes for purposes other than those for which they are designed will often result in short life and poor results. Also be sure that you place the tube in the correct socket in the set; a great number of "blow-outs" are caused by failure to do so.  
 (6) Never attempt to use a "hi-mu" tube in a transformer-coupled amplifier; by doing so, you will get distortion. The "c" tubes, however, are often good detectors when properly used with audio transformers.  
 (7) When using dry-cell tubes such as the "99", be sure that you do not use more than 3.3 volts on the

filament. It is advisable to connect a voltmeter across the filament to show the voltage. These tubes soon become paralyzed if excessive filament voltage is applied.  
 (8) In using A.C. tubes make sure that the transformer supplies the correct voltages. Due to changes in the line voltage, a transformer will often supply much higher voltages than those required. An accurate A.C. voltmeter should be used to check these values.  
 (9) Follow the manufacturer's instructions for using a tube. The manufacturer has spent considerable time and expense in the design of the tube, but it cannot operate correctly unless the instructions which accompany each tube are followed exactly.  
 \*—Courtesy Sonatone Tube Co.

## VERSATILE POWER AMPLIFIER FOR USE WITH SHORT WAVE AND BROADCAST TUNERS AND PHONO PICK-UPS

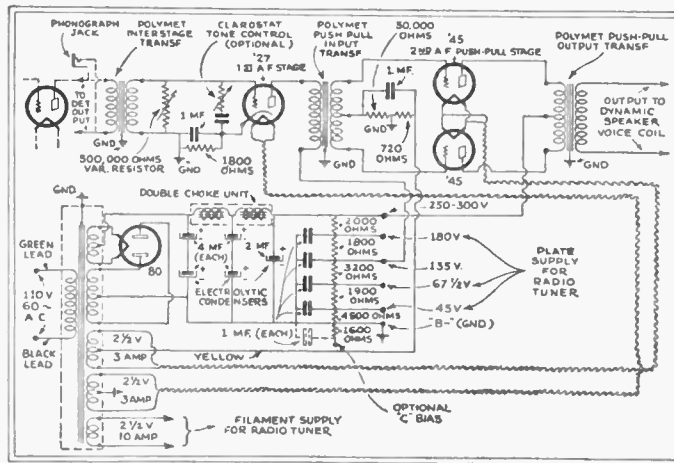
Power amplifiers suitable for use with short-wave receivers have to be very carefully designed and balanced, otherwise there is liable to be an objectionable "hum" noticeable in the loud speaker and not every power amplifier is sufficiently stable to operate on short-wave signals.

For the Short-Wave Fans who desire greater power output from the second audio stage, this power amplifier will be found useful. It employs two 45 tubes in the push-pull output stage and a 27 first audio tube. This amplifier is to be operated on 110 volt, 60 cycles, A.C. circuit. The plate supply furnishes the "B" current for the tubes in the R.F. and detector stages. Hum is reduced to a minimum by liberal size chokes and transformers.

### General Requirements

The two-stage, audio frequency, power amplifier here illustrated and described was constructed and tried out successfully, with practically no "hum" audible in the loud speaker and without audio frequency "howls" being set up. It is important to mention, however, in passing, that the amplifier was tested in conjunction with a Hammarlund short-wave receiver, employing one stage of tuned R.F. ahead of the detector, with the usual throttle condenser control of the regeneration.

This amplifier is a good all-around piece of apparatus and can be used in conjunction with any broadcast receiver and also for amplifying phonograph pick-up signals, by connecting the output of the magnetic pick-up to the phonograph jack shunted across the input terminals of the first A.F. transformer. One of the most important points to watch out for in building any audio frequency amplifier, particularly those of the power type here described, is the proper positioning of the various transformers, choke coils, etc., so that the magnetic fields of the transformers do not interact with one another and thus constitute one of the frequent causes of an objectionable "hum" or other noise heard in the speaker as a "background" to the signal being received. It is therefore desirable that the inexperienced constructor follow the general layout of the apparatus comprising the amplifier as here illustrated.



Schematic diagram of complete power amplifier which may be used in conjunction with a short-wave tuner, broadcast tuner, phono pick-up or microphone.

### The First Audio Stage

Looking at the wiring diagrams presented herewith you will see that there are two optional suggestions for building up the first audio stage, the first method involving the use of a Polymet inter-stage A.F. trans-

former. The transformer used in any case, should have a low ratio between the primary and secondary turns. The second method, and one which has received great favor at the hands of short-wave enthusiasts, comprises an impedance or choke coil coupling as the optional diagram herewith delineates.

The impedance used in tests was the secondary center-tapped winding of a Polymet audio push-pull input transformer with the primary winding left unused. The detector plate lead is connected to the center tap lead, the 0.25-mfd. grid condenser to one of the end (grid) leads and the B+ supply lead to the other. With impedance coupling of the first stage into the 27 tube, a 100,000-ohm potentiometer (Clarostat or other equivalent type), serves to balance the input to this tube. Grid bias for the first audio tube is provided by the 1800 ohm resistance, shunted by a 1-mfd. condenser.

### Tone Control Feature

A tone control circuit was tried out very successfully with this amplifier and the one tested was a Clarostat



Panel-type tone control comprising a fixed condenser of .000-mfd. in series with a specially tapered, variable resistance.

It may be of interest to many to know that this tone control circuit is the same as that supplied on many of the commercial broadcast receivers, the only difference being that a more elaborate scale for the tone control feature is provided. The tone control regulator comprising the condenser and specially tapered resistance in series, can also be shunted across the two grids of the '45 tubes in the second A.F. push-pull circuit.

A number of ground connections are indicated in the diagram and where the various transformers, condensers, etc., are not mounted on a metal sub-base, all of the ground connections indicated are joined to one piece of wire, not smaller than No. 14 B & S gauge, and of course, all joints must be soldered. The metal casings of all transformers and condensers should be connected to the common ground wire, so as to minimize all noises or hum in the reproduction at the loud speaker.

## Second Audio Stage Is Push-Pull

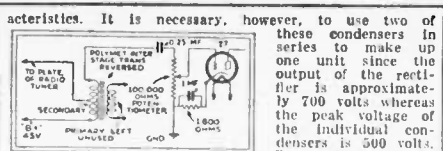
For building up the push-pull power stage, which involves the use of two '45 power tubes, a set of matched Polymet push-pull input-output transformers was employed.

The grid return circuit from the '45 power tubes has a 50,000-ohm and 750-ohm resistance connected in series with the center tap of the filament transformer winding, supplying the 2½-volt A.C. to the '45 tubes. A Thordarson '45 compact push-pull amplifier plate supply unit of 80-watt capacity was employed, as the diagram shows, this unit containing three filament supply windings, and the high voltage winding for the plate supply.

A word of caution to those building an amplifier of this type, is to test out all transformers, choke coils and resistances for electrical continuity. Most of these tests can be very well made with a milliammeter and a small "B" or "C" battery. If one of the resistances in the grid return circuit, such as the 50,000-ohm unit, should be open-circuited an objectionable hum would be heard in the loud speaker. All of the resistance coils used in building this amplifier were of the baked enamel type. Kroklok resistors and they have performed very satisfactorily indeed.

## Details of the Filter

The filter circuit is composed of a double 30-henry filter choke and electrolytic condensers comprising 10 mfd. Electrolytic rather than paper condensers were chosen because of their long life and surge-proof char-



Optional method of coupling amplifier to radio tuners

acteristics. It is necessary, however, to use two of these condensers in series to make up one unit since the output of the rectifier is approximately 700 volts whereas the peak voltage of the individual condensers is 500 volts. The added expense involved in this arrangement is well worth the assurance of fidelity of operation under all conditions of voltage surge. Incidentally electrolytic condensers are extremely more compact and easily mounted than the ordinary paper condensers. Of course if you want to employ the paper condensers—that's up to you.

The 15,000-ohm voltage divider resistance shown in the diagram is of the variable type and performs in very excellent fashion, without getting so hot that one can fry flapjacks on it, as some of these "line special" resistances are wont to do. Although a 15,000-ohm voltage divider is employed, but 13,000 volts are utilized; the remaining resistance being either employed as a grid bias resistor for the radio tuner or left unused. A potential of approximately 350 volts was measured with a headrite voltmeter across the output terminals of the filter, or in other words across the end terminals of the voltage divider resistance. Each step or tap on the voltage divider is shunted by a 1-mfd. condenser.

Neutron tubes were used with very gratifying success in all of the stages of the amplifier and very satisfactory performance in amplifiers during the past year has proven that they do stand up and give quality as well as service.

## Assembly of Parts

We do not deem it necessary to go into detail in describing the assembly and placement of the various parts. Suffice it to say that wherever possible an aluminum shield base should be used as the basic support and that all exposed transformer winding, etc., either be shielded or turned at right angles to each other so that their magnetic fields do not conflict and cause disturbances. An ordinary aluminum baking pan from the kitchen, when turned bottom up makes an excellent and inexpensive base. The sides of the pan should be deep enough to permit the by-pass, filter condensers, etc., to be mounted underneath.

## Hints On Eliminating "Hum"

1—Ground all transformer and condenser cases.

- 2—Test grid return bias resistors for "continuity" and by-pass condensers for "short-circuits."
- 3—Center tap on filament windings may not always be at exact electrical center; connect 400-ohm potentiometer across filament winding and join grid return lead to arm of potentiometer.
- 4—Measure current in both sides of '45 plate circuits and also in both sides of '80 rectifier tube plate circuits; if these are unequal this trouble should be rectified as it is liable to cause hum. Sometimes a new tube is required in order to eliminate hum.
- 5—Sometimes the A.C. supply plug, where it fits into the house service receptacle has to be reversed.
- 6—in some cases, or with some amplifiers, it may be necessary to employ an extra high voltage filter, in other cases a greater filter condenser capacity has to be employed.
- 7—Keep the '80 rectifier tube away from the input transformer, as the field from the tube often reacts on the first A.F. transformer; result = hum.
- 8—Sometimes a "hum" is picked up from the detector and R.F. tuner stage and is then amplified by the power amplifier. Listen to your detector output with phones to ascertain if it is hum-free.
- 9—Sometimes an objectionable hum is due to the dynamic speaker itself, necessitating the use of a larger condenser across its field. Don't crowd dynamic speakers on top of R.F. tuners, detector circuits, or power amplifiers if you want hum-free reception.

## List of Parts

Quantity	Description	Cat. No.	Your Price
1	Thordarson '45 Power trans.	1450	\$3.85
1	Double Choke	1408	1.10
1	Polymet Interstage A.F. transformer	1408	.85
1	Polymet P.P. Input transformer	1408	1.10
1	Polymet P.P. Dynamic output trans.	1408	.85
1-4	mfd. Electrolytic condensers	1804	3.40
1-2	mfd. Electrolytic condenser	1802	.45
1	15,000 ohm variable voltage divider	2N1C	.90
1	Claroat 500,000 ohm var. resis.	2234	.90
1	50,000 ohm Lynch metallized resistor	3305	.18
1	750 ohm Lynch metallized resistor	3305	.18
1	1,000 ohm Lynch metallized resistor	3305	.18
1	Open Circuit Jack	3N1C	.35
1	25 ft. push-back hook-up wire	1660	.18
1	Claroat panel mount tone control	2232	1.08
2	Binding posts, hardware, etc.	appr	.65
Total			\$16.25

## Constructional Data of a

The application of the dynatron circuit, to an oscillator, produces a testing instrument of great value to radio service men; the dynatron oscillator is versatile, stable and efficient. Provided that it is properly constructed, using good coils and high-grade components, it can be calibrated accurately, so that it will perform the functions of an expensive laboratory instrument. Moreover, it will maintain its accuracy indefinitely.

The dynatron oscillator, in addition to its many other advantages, is very easy to construct, since it consists only of nine or ten parts. Hence its cost is negligible. The entire instrument may be assembled within a small aluminum box shield as shown. The circuit has a number of interesting features. First of all, no batteries are required, and the oscillator can be used on either A.C. or D.C. When used on direct current, modulation is obtained by means of the commutator ripple. On D.C. the positive terminal of the plug must go to the end of resistor (9); and the negative to switch (10), and then directly to the filament. The polarity may be determined by trial, simply reversing the plug if incorrectly connected at first.

The dynatron oscillator uses a 122 screen-grid tube, operated at such voltages that oscillations are produced when the tuned circuit is connected in series with the plate. This type of oscillator requires only a single coil; thus simplifying the circuit and permitting rapid changes of range, through the use of plug-in coils.

The tuned circuit consists of a plug-in coil, shunted by a S.L.F. variable condenser. The necessity for an accurate condenser and coil cannot be emphasized too strongly. In order to cover the range from 15 to 200 meters, five Hammarlund short-wave plug-in inductor coils are specified. These coils are highly efficient and therefore will be certain to give the desired accurate results. To cover the range from 205 to 550 meters, a special coil must be wound. Directions for making this coil will be given in later paragraphs. In order to keep the special coil small and compact, the coil is calculated with an inductance of 560 microhenries; so that it covers a band of from 300 to 550 meters, when tuned with a 150-mfd. condenser. By taking advantage of the second and third harmonics, it is possible to tune the circuit to any desired point between 200 and 300 meters; for example, the second harmonic of 400 is 200, etc.

When the oscillator is to be used for long waves, as in superheterodyne tuning, honeycomb coil may be substituted at (2). This oscillator may even be used to generate audio frequencies, by connecting the primary of an audio transformer in the plate circuit of the tube. The various required filament, plate and grid voltages are obtained by means of the voltage drop across the fixed resistors (6), (7), (8) and (9). It will be noted

## SERVICEMEN'S TEST OSCILLATOR

### Versatile Oscillator Employing Latest A.C.-D.C. Dynatron Circuit

that the control grid is connected directly to the filament.

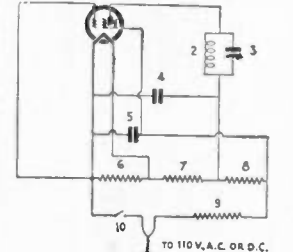
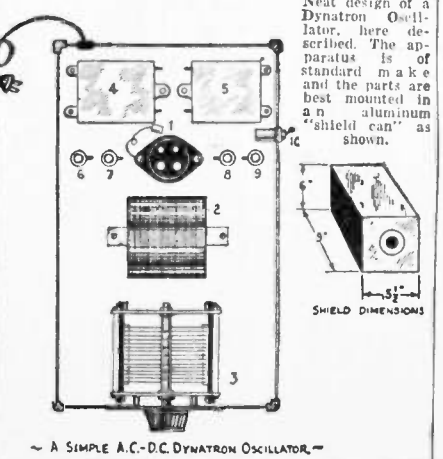


Diagram of Simple Dynatron Oscillator

The four resistors are in series across the 110-volt line. Resistance (9) reduces the voltage to about 60 volts, which is applied to the screen-grid. Resistance (8) reduces the voltage to 20 volts for the plate. There is an "IR" drop of 3 volts (plus) across resistance (6), to provide the proper filament voltage. The dynatron oscillator, used



~ A SIMPLE A.C.-D.C. DYNATRON OSCILLATOR ~

with a Weston "Model 571" out at meter, gives the radio service man a very convenient and accurate means of adjusting the alignment of R.F. stages.

Using a dial on the dynatron oscillator, calibrated from zero to 100, calibration charts may be plotted for each plug-in coil; so that the actual wavelengths emitted by the oscillator can be obtained instantly, from one of the charts.

The special coil for covering the broadcast range is wound on a piece of bakelite of two inch diameter. No. 28 D.C.C. magnet wire is used. Starting 15" from the end of the bakelite form, 130 turns are wound. This furnishes an inductance of 560 microhenries, tuning between 300 and 550 meters with a .00015 mfd. variable condenser. Second and third harmonics are used for points between 200 and 300 meters. In order to use the special coil as a plug-in coil, an extra Hammarlund LW-20 inductor coil may be obtained. The windings should be removed from this and the special coil fastened in place instead, with connections properly soldered. In this way, the broadcast coil can be plugged into the base as readily as the short wave coils.

## Complete List of Parts Required for the A.C.-D.C. Dynatron Oscillator

Quantity	Description	Cat. No.	Your Price
1	.000140 mfd. S. L. F. Variable Condenser (3)	1279	\$1.70
1	Set of Hammarlund Short-Wave, Plug-In Inductor Coils for 20, 30, 40 and 80 meter bands, with base type LW1-4 (2).	4N1C	8.45
1	Hammarlund Short-Wave, Plug-In Inductor Coil for 120 meter band, type LW1-120 (2).	5N1C	2.00
2	1.0 mfd. metal case condensers (4.5)	1225	.70
1	Fixed resistor 150 ohms, 25 W. (7)	6N1C	.30
1	Fixed resistor 1000 " " 25 W. (6)	3308	.38
1	Fixed resistor 350 " " 25 W. (9)	7N1C	.30
1	Fixed resistor 1000 " " 25 W. (66)	3308	.38
1	A.C. Toggle Switch (10)	1601	.25
1	Vernier tuning dial	1580	.75
1	Blau Aluminum shield box 6" x 8" x 5 1/2"	8N1C	1.95
1	Roll hook-up wire (push-back type)	1660	.18
1	Four prong U.X. Socket (1)	1940	.33
1	Screen Grid 222 tube	625	1.60
1	Weston Mod 571 Output Meter (optional)		
1	Insulated form 2" diameter for Coil 2	9N1C	.30
1	1/2 lb. Spool No. 28 D.C.C. wire for Coil 2	2528	1.15
Total			\$16.25

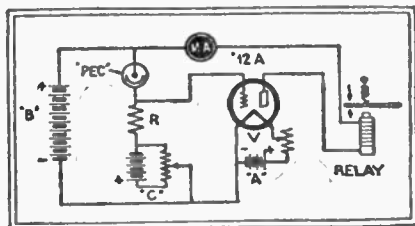
## New Photoelectric Cells

Photoelectric Cells have been used in the past for a variety of purposes, and to further popularize their utility, two new cells have made their appearance on the market. One is a potassium cell, our Cat. No. 627; and the others are of the caesium type, our Cat. Nos. 640 and 641.

The potassium type has a sensitivity of 5 microamperes per lumen. It has an anode of nickel ribbon, the bottom of which is screened to prevent any leakage between the anode and cathode.

The caesium cell has a much higher sensitivity, or 28 microamperes per lumen. The photo-sensitive surface is coated with a very thin layer of caesium—hence the name.

The diagram illustrates the manner in which a light-sensitive or photoelectric "PEC" may be connected so as to operate a relay, which in turn may actuate any electrical circuit desired. When a potassium cell is used the value of R should be about 10 megohms, and the "B" approximately 135 volts. If a caesium cell is used then R should be about 2 megohms, and the "B" potential 90 volts.



The new caesium cells are a recent development in the photo-electric field. They are absolutely stable, non microphonic and will operate continuously over a long period of time without voltage adjustable of any kind. The caesium element is "plated" on the surface of a special concave metal plate (constituting one of the electrodes) and having the second electrode at its center of curvature.

They possess high sensitivity, responding instantaneous to all light impulses; a decided advantage over the old potassium type cell.

Photo-electric Cells, aside from their conventional use, in experimental television transmission lend themselves admirably to a variety of other interesting uses and experiments. Burglar and fire alarms, sound picture work, matching of color, relaying control devices, facsimile transmission and timing devices, are only a few of the many uses to which these versatile cells, may be adapted.

## Electrical Units

**VOLT.**—The unit of Electro Motive force. Force required to send one ampere of current through one ohm of resistance.

**OHM.**—Unit of Resistance. The resistance offered to the passage of one ampere, when impelled by one volt.

**AMPERE.**—Unit of Current. The current which one volt can send through a resistance of one ohm.

**COULOMB.**—Unit of Quantity. Quantity of current which, impelled by one volt, would pass through one ohm in one second.

**FARAD.**—Unit of Capacity. The capacity of a conductor or condenser which will hold one coulomb under the pressure of one volt.

**WATT, UNIT OF POWER.**—The power to do work when one ampere passes through one ohm, under pressure of one volt.

**JOULE, UNIT OF WORK.**—The work done by one Watt in one second.

## Some Useful Tables

Old Weights and Measures With Their Equivalents in the New or Metric System.

MEASURES OF LENGTH		French Metres	
Inches	Feet	Yards	Miles
12	1	.02778	.000126
36	3	.08333	.000189
72	6	.16667	.000274
198	16 1/2	.54	.000394
7,920	660	220	.000568
63,360	5,280	1,760	.000824

AVOIRDUPOIS		French Grammes	
Drachms	Ounces	Pounds	Ton
16	1	.0625	.0000174
256	16	.000558	.000028
7,168	448	.00893	.000417
28,672	1,792	.28	.0125
573,440	35,840	112	.05
		2,240	1

MEASURES OF CAPACITY		Litres	
Pints	Gallons	Pecks	Bushels
1	1/125	.0625	.01562
8	1	.5	.125
16	2	1	.25
64	8	4	1
512	64	32	8
2,560	320	160	40
5,120	640	320	80

## Tone Controls

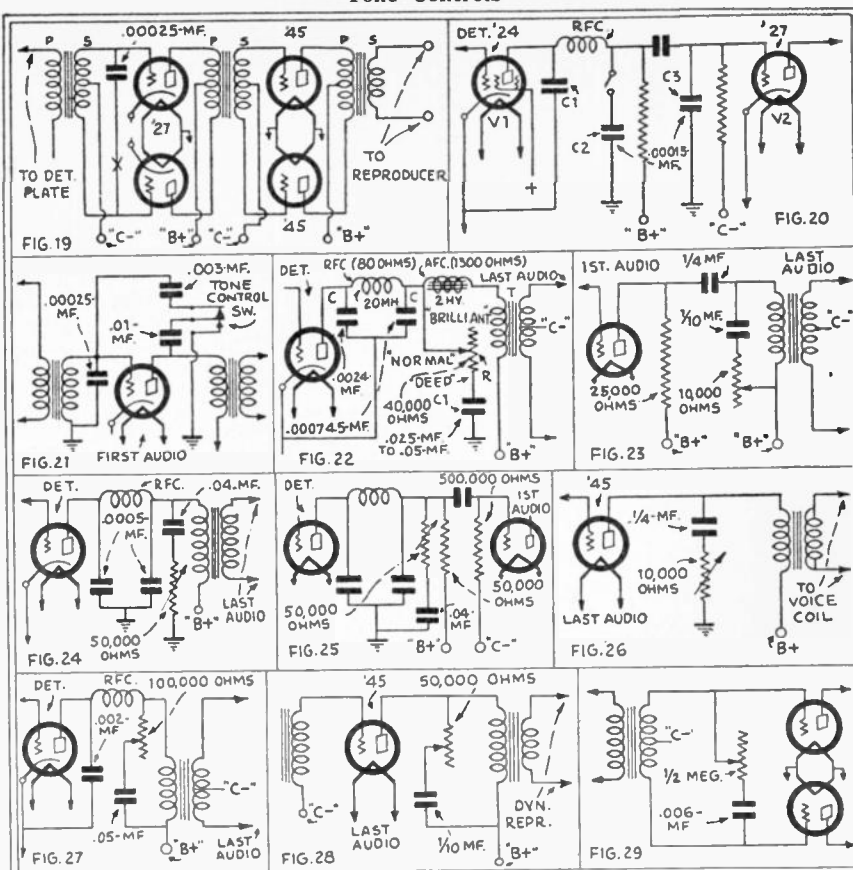


Fig. 19, All-American Mohawk "No. 90"; Fig. 20, Sil "7-70"; and "7-71"; Fig. 21, RCA superheterodyne Fig. 22, Kennedy "Model 26"; Fig. 23, a representative sets; Fig. 27, Grebe "Super-Synchrophase Type AH-1"; "Models 58" and "59" radio sets. Note particularly the developed. In Fig. 23, a tapered variable resistor for

ver-Marshall "Model 720"; Fig. 21, Bremer-Tully es; Fig. 23, Silver-Marshall "34-A" and "35-A"; ve commercial circuit; Fig. 26, "Jackson-Bell" midget Fig. 28, Remler "Midget receiver"; Fig. 29, Bosch e RCA circuit. Fig. 22, which is perhaps the best yet r tone control is utilized.

One feature found in modern sets which is not in the older ones is the tone control. The tone control is usually nothing more than a variable resistor connected in series with a fixed condenser, and the whole connected across the primary or secondary of one of the audio transformers. While many question the desirability of the tone control, arguing that the set should be designed for the maximum quality output and left permanently fixed, there are many who find the use of a tone control pleasing. While it obviously distorts in cutting out the high overtones which represent life and brilliancy in the music, the resultant muffled tone is sometimes pleasing.

Tone controls can be purchased separately and connected to the set and operated as an accessory. It is more desirable, however, to install the tone control permanently within the set and supply a control knob for it on the panel. Any of our variable resistors, up to 250,000 ohms connected in series with a .005-mfd. fixed condenser and the whole connected across the grid and filament of the output power tube will serve as a practical tone control. Figures 19 to 29 inclusive, show a few tone control circuits. These can easily be followed and tried out on any type of receiver, the best one for your particular set being found by trial. The values of the condensers and resistors shown in the diagrams are indicated.

## Centigrade and Fahrenheit Temperature Scales

Centigrade	Fahrenheit	Centigrade	Fahrenheit	Centigrade	Fahrenheit	Centigrade	Fahrenheit
------------	------------	------------	------------	------------	------------	------------	------------

0	32	30	86	50	122	80	176
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5	41	35	95	55	131	85	185
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10	50	38	100.4	60	140	90	194
----	----	----	-------	----	-----	----	-----

15	59	40	104	65	149	95	203
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20	68	42	107.6	70	158	100	212
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25	77	45	113	75	167		
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Temp. C.=5/9 (Temp. F.)-32.  
Temp. F.=9/5 (Temp. C.)+32.



## Short Wave Adapters and Converters

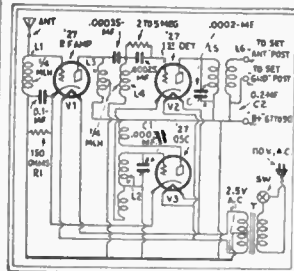


Fig. 7

Schematic circuit of the "Air King" for A.C. operation, incorporating a 2.5-volt filament transformer.

and skill of the operator, unusually reported from the hundreds of our customers who are using them.

There are two general types of short-wave adapters; the superheterodyne type (commonly called converters) and the plain, one-tube regenerative short-wave tuner and detector designed for connection to the audio amplifier of the broadcast set.

The former type employs three tubes, an R.F. amplifier tube, first detector, and oscillator. The short waves are superheterodyne action into broadcast waves which can be tuned in on the broadcast set. This is one of the most sensitive types of short-wave adapter. The output of the adapter is connected to the aerial and ground posts of the broadcast set and the aerial and ground are connected to the adapter. See Fig. 9. Plate voltage for the adapter is obtained from the power supply of the set. Filament current is obtained from a separate filament transformer in the adapter which is connected to the A.C. line. Heats type '27 tubes are em-

ployed. They can be operated from a battery by connecting the three heaters in series as in Fig. 8 and connecting them to a 6-volt storage battery. In this case the filament transformer is not used. A circuit of a typical superheterodyne short-wave adapter is shown in Fig. 7. In use, the broadcast receiver is tuned to a certain wavelength over which no broadcast interference is coming and adjusted to its maximum sensitivity. All tuning is then done on the adapter. Plug-in coils are provided for covering the various short-wave bands.

The simple regenerative type of short wave adapter is shown in the diagram of Fig. 10. This is a very simple outfit and can easily be made up from parts found about the radio workshop or purchased very cheaply. A good set of short-wave coils is recommended, and also a good vernier-type tuning condenser. Shielding is also an advantage.

In the circuit of Fig. 10, the terminal 2 should be connected to the plate of the detector tube of the broadcast receiver, after the detector tube is removed. The experimenter can easily make a plug adapter for making the proper connections. A type '99 or '01A tube works well in the adapter. Terminals 4 and 1 must be connected to a suitable "A" battery, which may be the one used in the set if battery operated.

Considerable interest is shown in the field of short-wave adapters for use with the regular broadcast receiver. Many do not want to go to the expense of obtaining a complete short-wave receiver for tuning in on foreign broadcasts, and naturally an adapter is the next best thing. While the sensitivity of the combination depends both upon the adapter and the broadcast set, as well as the location, aerial good results are

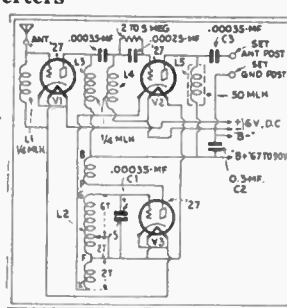


Fig. 8

For battery use, the efficient '27 type tubes are used, as in the A.C. model, but with filaments in series, giving proper bias. Note the wave-changing "Hi-Lo" switch S, across two turns of L2.

By means of the transformer provided for covering the various short-wave bands. The simple regenerative type of short wave adapter is shown in the diagram of Fig. 10. This is a very simple outfit and can easily be made up from parts found about the radio workshop or purchased very cheaply. A good set of short-wave coils is recommended, and also a good vernier-type tuning condenser. Shielding is also an advantage.

In the circuit of Fig. 10, the terminal 2 should be connected to the plate of the detector tube of the broadcast receiver, after the detector tube is removed. The experimenter can easily make a plug adapter for making the proper connections. A type '99 or '01A tube works well in the adapter. Terminals 4 and 1 must be connected to a suitable "A" battery, which may be the one used in the set if battery operated.

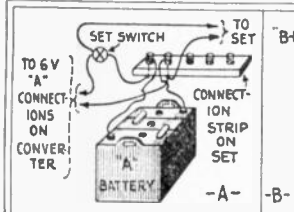


Fig. 9

Connections of the converter (Fig. 8) to a 6-volt battery are shown at A. The A.C. converter is shown at B, though either type uses similar antenna and ground connections. One method of obtaining "B" voltage from the set is shown at C; though a separate battery is often more satisfactory.

### Conversion

Factors to Multiply	By	To Get
Amperes	$\times 1,000,000,000,000$	microamperes
Amperes	$\times 1,000,000$	microamperes
Amperes	$\times 1,000$	milliamperes
Cycles	$\times .000,001$	megacycles
Cycles	$\times .001$	kilocycles
Farads	$\times 1,000,000,000,000$	micromicrofarads
Farads	$\times 1,000,000$	microfarads
Farads	$\times 1,000$	millifarads
Henrys	$\times 1,000,000$	micromicrohenrys
Henrys	$\times 1,000$	millihenrys
Kilocycles	$\times 1,000$	cycles
Kilovolts	$\times 1,000$	volts
Kilowatts	$\times 1,000$	watts
Megacycles	$\times 1,000,000$	cycles
Mhos	$\times 1,000,000$	micromhos
Mhos	$\times 1,000$	millimhos
Microamperes	$\times .000,001$	amperes
Microfarads	$\times .000,001$	farads
Millihenrys	$\times .000,001$	henrys
Micromhos	$\times .000,001$	mhos
Micro ohms	$\times .000,001$	ohms
Microvolts	$\times .000,001$	volts
Microwatts	$\times .000,001$	watts
Micromicrofarads	$\times .000,000,000,001$	farads
Micromicro-ohms	$\times .000,000,000,001$	ohms
Milliamperes	$\times .001$	amperes
Millihenrys	$\times .001$	henrys
Millimhos	$\times .001$	mhos
Milliohms	$\times .001$	ohms
Millivolts	$\times .001$	volts
Milliwatts	$\times .001$	watts
Ohms	$\times 1,000,000,000,000$	micromicro-ohms
Ohms	$\times 1,000,000$	micro-ohms
Ohms	$\times 1,000$	milliohms
Volts	$\times 1,000,000$	millivolts
Volts	$\times 1,000$	volts
Watts	$\times 1,000,000$	microwatts
Watts	$\times 1,000$	milliwatts
Watts	$\times .001$	kilowatts

### Winding Turns Per Linear Inch

B & S G-size No.	D.C.C.	S.C.C.	Enamel
6	5.44	5.60	
7	6.08	6.23	
8	6.80	6.94	
9	7.64	7.68	
10	8.51	8.55	
11	9.58	9.60	
12	10.62	10.80	
13	11.88	12.06	
14	13.10	13.17	14.00
15	14.48	14.90	16.00
16	16.40	17.29	18.00
17	18.10	18.80	21.00
18	20.00	21.00	24.00
19	21.50	23.00	27.00
20	23.00	26.00	30.00
21	26.20	29.00	32.00
22	28.58	32.00	36.00
23	31.12	34.00	40.00
24	33.60	37.00	45.00
25	36.20	41.50	50.00
26	39.00	45.00	57.00
27	42.00	49.00	64.00
28	45.50	54.00	71.00
29	48.60	58.80	81.00
30	51.10	64.40	88.00
31	55.80	69.60	101.00
32	60.20	75.00	120.00
33	64.30	81.00	140.00
34	68.60	87.60	160.00
35	73.00	94.20	180.00
36	78.50	101.00	190.00
37	84.00	108.00	195.00
38	89.10	115.00	205.00
39	95.00	122.50	215.00
40	102.50	130.00	230.00
41	112.00	153.00	240.00
42	124.00	168.00	253.00

## USEFUL DATA

### Tools the Radio Service Man Should Carry

- 1 filament-break or neutralizing adapter, UX. (4 prong)
- 1 filament-break or neutralizing adapter, UY. (5 prong)
- 1 standard set analyzer.
- 1 small hand drill with assorted drills.
- 1 set of small files.
- 1 hammer.
- 1 pair high resistance headphones.
- 1 electrician's knife.
- 1 portable modulated oscillator.
- 1 pair diagonal cutting pliers.
- 1 pair long nose pliers.
- 1 pair 6" side cutting pliers.
- 1 complete set of vacuum tubes.
- 1 non-metallic screw driver.
- 1 large screw driver.
- 1 small screw driver.
- 1 set small socket wrenches.
- 1 electric soldering iron.
- 1 rosin core solder.
- 1 roll friction tape.
- 1 assorted nuts, screws and washers.
- 1 roll solid No. 18 Push Back Wire.
- 1 non-metallic socket wrenches.
- 1 set small open end wrenches.

The above are bare necessities. In addition to these the well prepared and efficient service man will also add the following items.

- 1 small bottle wood alcohol.
- 1 pocket ammeter.
- 1 small bottle household ammonia.
- 1 small piece of cheese cloth.
- 7 small fixed condensers—.0001—.001—.006—.00025—.01—5—50 mfd.
- 1 star drill.
- 1 small flashlight, fourteen pen type.
- 8 grid leaks—.1—25—.5—1.0—2.0—5.0—10. megohms.
- 1 small hydrometer in carrying case.
- 2 glass insulators.
- several "Nail-It" knobs.
- 1 can nokorolite.
- 1 small bottle furniture polish.
- 5 carbon resistors—500, 700, 800, 1000, 2000 ohms.
- 6 variable wound resistors — 2000, 5000, 10,000, 25,000, 50,000, 100,000 ohms.
- 6 wire wound resistors — 1000, 2000, 3000, 5000, 7500, 10,000 ohms.
- 1 small bottle Vaseline.
- 1 roll antenna wire.
- 1 roll lead in wire.
- 1 #132 tap and wrench.
- 1 #132 tap and wrench.
- 1 dentist's hand mirror.

### Conversion Table—Kilocycles to Wavelength

Kilocycles	Wavelength Meters	Kilocycles 1030	Wavelength Meters
550	545.1	1030	291.1
560	533.4	1040	288.3
570	526.0	1050	285.5
580	516.9	1060	282.8
590	508.2	1070	280.2
600	499.7	1080	277.6
610	491.5	1090	275.1
620	483.6	1100	272.6
630	475.9	1110	270.1
640	468.5	1120	267.7
650	461.3	1130	265.3
660	454.3	1140	263.0
670	447.5	1150	260.7
680	440.9	1160	258.5
690	434.5	1170	256.3
700	428.2	1180	254.1
710	422.3	1190	252.0
720	416.4	1200	249.9
730	410.7	1210	247.8
740	405.2	1220	245.8
750	399.8	1230	243.8
760	394.5	1240	241.8
770	389.4	1250	239.9
780	384.4	1260	238.0
790	379.5	1270	236.1
800	374.8	1280	234.2
810	370.2	1290	232.4
820	365.6	1300	230.6
830	361.2	1310	228.9
840	356.9	1320	227.1
850	352.7	1330	225.4
860	348.6	1340	223.7
870	344.6	1350	222.0
880	340.7	1360	220.4
890	336.9	1370	218.8
900	333.1	1380	217.3
910	329.5	1390	215.7
920	325.9	1400	214.2
930	322.4	1410	212.6
940	319.0	1420	211.1
950	315.6	1430	209.7
960	312.3	1440	208.2
970	309.1	1450	206.8
980	305.9	1460	205.4
990	302.8	1470	204.0
1000	299.8	1480	202.6
1010	296.9	1490	201.2
1020	293.9	1500	199.9

## Converts Broadcast Receivers into S.W. Super-Hets.



FIG 1

In compliance with the many requests which we have received from our customers for constructional data on a really efficient and reliable short-wave converter, we print herewith an article on a converter which we had especially constructed for this purpose.

Interest in short-wave reception is international, and particularly so in isolated and distant points, where the only possibility of hearing broadcasts from Europe and the United States is on the short waves.

This converter uses three tubes to produce a heterodyned signal, which is fed into an A.C. electric broadcast set, and, thereby, specially high amplification of the signal is obtained.

The coupling between the '24 first detector tube and the '27 oscillator is different from that usually employed, and isolates the two tuned circuits from interlocking. While it puts but a small part of the energy of the oscillator on the first detector, it will be remembered that an oscillator is much more powerful than the received signal.

We think that many short-wave fans will be interested in this novel book-up.

A very desirable means of obtaining short-wave reception is to utilize the present broadcast receiver as a superhetrodyne, by means of a short-wave converter. It is unnecessary to change any of the internal connections of the receiver, which is used solely as an intermediate-frequency (and A.F.) amplifier. The idea is not new, and many converter circuits have been published.

For several reasons, we prefer the "Superband" circuit, shown in Fig. 1, which assures the greatest independence between the first detector and the oscillator; each of which can be tuned without affecting the other. The output of this converter may be connected directly to the antenna post of any receiver, without danger of a short circuit.

In operation, one first adjusts the broadcast receiver to a point where no stations are heard on the broadcast band. As the receiver is equally sensitive on all wavelengths, most of these are most responsive at the higher frequencies; it is desirable to seek a setting near the point of highest amplification. If the receiver has several tuning controls, adjust them all for the greatest sensitivity.

Then connect the aerial lead-in directly to the input of the first detector; turn the dial of the detector to any position, and rotate the oscillator dial in search of a signal. If you do not hear it, reverse the detector dial a few degrees and search again. When a signal is heard, tune in, adjust the dial of the first detector to obtain the loudest signal, and set the potentiometer for greatest sensitivity. If the broadcast receiver is of the single-conc type, its setting may be adjusted, instead of the oscillator dial.

The lead-in clip is then connected to the antenna coil L. Begin at the middle of the coil, and gradually move the clip toward the ground terminal; testing each connection until the greatest signal intensity is found. When this operation is completed, it may be

well to reduce the volume control; for many short-wave signals will be found too loud.

For greatest convenience in operating this converter, the condensers tuning the R.F. and the first-detector stages may be ganged on one shaft, using midget condensers to trim them.

The coils used by the writer were made as follows: L and LL, each five turns of No. 4 copper wire, spaced  $1/5$  inch apart, self-supporting and 2 inches in diameter. Equivalent coils may be used for a .00025-mfd. condenser, or whatever value is employed.

The oscillator coil has two windings (as shown in Fig. 2) of six turns each on a two-inch tube, of No. 22 wire, spaced 1/5 inch. These values are suitable for reception between 17 and 40 meters.

The 5000-ohm resistor R1 (which may be of the variable type) is used to reduce the voltage applied to the plate of the oscillator and prevent unnecessary current consumption. The detector grid leak, although not on the diagram as such, should be of the variable type. This arrangement permits the proper adjustment of the grid bias of the detector for best operation.

The 100,000 ohm potentiometer R2, which regulates the screen grid voltage, may be set, to begin, at the third of its resistance to supply a potential of 50 volt. or so.

It is necessary to shield the stages very carefully from each other, to prevent coupling. A separate can is

The converter may be used without the R.F. stage shown here, in which case the lead-in clip is attached directly to the turns of L1 instead of L.

It is preferable to use a small "B" power unit separate from that already employed with the broadcast receiver; nevertheless voltage taps may be taken from the latter, with suitable precautions against coupling (filter chokes or resistors with suitable by-passing

The quality of reception obtained by the use of this converter is excellent, and the modulation of short-wave broadcasts will be found as good as that of the local broadcast stations. The cost of parts is small, and the assembly is not difficult. It is recommended that anyone who has a good broadcast receiver, and wishes to listen to short-wave broadcasting under the best conditions,

Quantity	Description	Cat. No.	Yours
1 $\frac{1}{2}$ lb. wood No. 22 D.C.C. Wire		2522	\$ .65
1 $\frac{1}{2}$ lb. roll No. 4 wire (ordinary bell wire)			will do
1 .5 mfd. by pass condenser		1221	.35
1 .0001 mfd. by pass condenser		1227	.25
2 .00025 mfd. by pass cond.		1230	.25
1 .002 mfd. by pass cond.		1236	.15
2 Hammarlund 00025 S. L. P. cond.		1277	4.00
1A .00026 will do)			
1 Variable grid leak		3500	.25
1 5000 ohm resistor		3315	.35
1 100,000 (or 75,000) ohm potentiometer		10N1C	.45
2 Insulated coil forms 2" diam.		9N1C	.65
1 200 600 meter R.F. choke		1444	1.30
1 Hammarlund short wave R.F. choke		11N1C	1.65
2 Blau aluminum shield boxes		12N1C	2.00

Total	\$10.69
-------	---------

**\$3.00 PRIZE SUGGESTIONS**  
to do it. Just send us a good suggestion that will be

The samples on these pages show you how to do it. Just send us a good suggestion that will be of benefit to other radio men, and if acceptable, we will publish it in our next issue.

It is not necessary to make good drawings; a rough sketch will do. Our artist will make the final drawing. Each suggestion printed here will be paid for at the rate of \$3.00 upon publication. Address all suggestions to **Editor, Radio Suggestions, c/o Radio Trading Company, 25 West Broadway, New York**

110V. AC LINE

CENTER TAP

5V TUBES

POWER TRANSFORMER

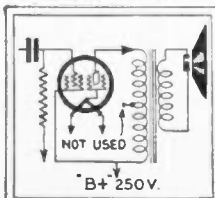
TO FILTER

(OLD '71 TUBES ARE USED)

The sketch shows a simple rectifier made from old type 171A tubes. This rectifier has given service for a long time and works very well. The grids and plates of the tubes are connected together as shown. Two tubes are used for rectifying each half of the cycle making four tubes in all. I find that tubes which have failed to give good service in the set work very well as rectifiers.

Suggested by:  
ALOIS BURDA, JR.  
New Prague, Minnesota

Any good output transformer, or dynamic speaker, designed for use on 2 1/2 P. P., will perfectly match the "Load Impedance" of a SINGLE PENTODE (47) and can be effectively used for same, by disregarding the center tap (except for insulating same) and using only the two end leads, as follows:



The A.C. Load Resistance for 1 '45 should be from 3500 to 3900 ohms. Therefore, a P. P. output '45 transformer should have 3900 ohms each side of the center tap, or a total of 7000 to 7800 ohms, end to end.

Suggested by:  
WM. M. FURY  
5939 Colgate Street  
Philadelphia, Pa.

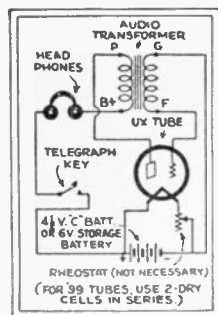
The schematic diagram shows a power supply of 1.5VOLT connected to a network of resistors and lamps. A 50 OHMS resistor is in series with a lamp and a TOGGLE SWITCH. A 1,000 OHMS resistor is in series with a lamp and a TOGGLE SWITCH. A 0.1 MA meter is connected in parallel with the 1,000 OHMS resistor. A UX 112 tube is connected in parallel with the 1,000 OHMS resistor. The circuit is connected to TEST LEADS and TO SET terminals.

This apparatus I find very useful for servicing radio receivers. Of all the work which the service man has to perform he finds use for the continuity tester much more often than any other testing device. Second to this perhaps comes the output meter, which is a great aid in balancing a set once the other faults have been located with the continuity tester. The illustration shows how the two devices may be combined into one. The one meter is used for both and the whole may be

meter is used for both and the whole may be  
d in a small box. Suggested by:  
**GEORGE A. MARTELL**  
417 Allen Street Chippewa Falls, Wisconsin



## Code Practice Oscillator



I have had quite a few calls from student Radio (Wireless) Operators to build an inexpensive "Oscillator" for home sending practice, that was not just a buzzer. I have also furnished the drawing of this "Oscillator" to quite a few "Ex-Op's", and operators "on-the-beach" who desired to keep their fists in good shape.

I have seen a number of variously designed and ingeniously constructed oscillators for this purpose, employing grid leaks, condensers, Hartley circuits, regeneration, and what-not, and none of them works as well, gives as clear a note, nor can be built of so little material as this one.

A study of the circuit will reveal that the connections to the secondary of the Audio Transformer are reversed. This is necessary to cause it to "oscillate".

### MATERIAL REQUIRED

(Numbers refer to articles in Catalog 21)	
One UX socket, such as No. 1850	\$0.15
Any Audio Transformer, such as No. 1129	.50
1X-201-A Tube (or 199)	.40
One Telegraph key, No. 2375	1.50
One pr. H. A. phones, No. 1679	1.05
One four and one half volt "C" battery	About .50
<b>Total</b>	<b>\$4.10</b>

(Some of this material you will no doubt have already.)

It will be noticed that I have not included the filament rheostat in the material list as it is not at all necessary although a 20 ohm variable resistor can be purchased for about twenty cents. (No. 2240).

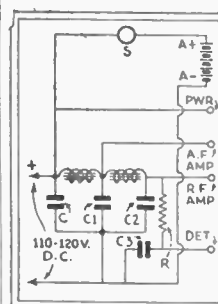
By experimenting you will find that different tubes of the same type will give a different note. Also the note can be varied at will by touching one of the filament connections with your finger.

Many "elaborations" can be added. If desired, such as placing a "B" battery in the plate circuit, plugging in a loud speaker, etc. Also many other uses for the Oscillator will suggest themselves.

Suggested by:

**THEO. BURDICK**  
754-51st Street  
Brooklyn, N. Y.

## Filter for 110 Volt D.C. Line



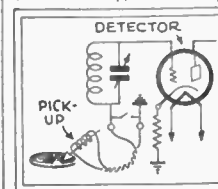
accidental short circuit. A similar condenser should also be inserted in the aerial lead.

The parts used in the circuit are as follows:	
C, C1, C2, C3, No. 127 Zenith condenser block	\$2.65
R-20,000 ohm resistor No. 2225	.075
Filter choke No. 1406	1.10
S-Light socket	.25
	<b>\$1.075</b>

Suggested by:

**F. T. OLIVERA**  
G. P. O. Box 438  
New York City

## Connecting Pick-Up to Power Detector

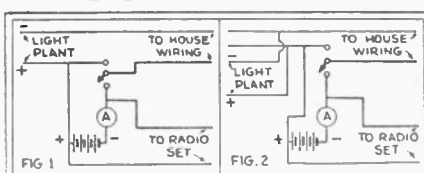


When connecting a phonograph pick-up in the grid circuit of a power detector stage, if the grid return is opened and a switch used as in sketch the pick up can be left connected while the set is in operation once the leads to the switch have been phased into the tuned circuit.

Suggested by:

**DANIEL WALKER**  
600 North Tyler Street  
Little Rock, Ark.

## Charging a Battery Without Cost



In charging a two, four or six volt storage battery from a 32 volt D.C. lighting plant according to the method shown there is no expense of charging because it only charges when the current is used for lighting the house. The bulbs in the house do not light quite as bright when the battery is on charge but the difference is so small that it is not noticed unless the battery is switched on and off.

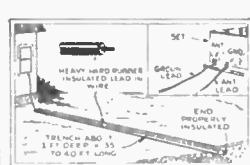
In Fig. 1 the charging rate is controlled by the number of bulbs in the house that are turned on or the amount of watts that is being used, a double throw switch is used and an ammeter may be connected in series with the storage battery to show the charging rate. If the charging rate is too much for the size battery it can be connected to a branch line as shown in Fig. 2.

To determine which wire is positive to connect to the storage battery turn on a bulb in the house and use a B battery voltmeter. The positive wire connects to the positive terminal on the storage battery and if the hand on the ammeter shows discharge reverse the connections on the ammeter.

Suggested by:

**MERLIN A. FREELAND**  
Daltom City, Illinois

## How to Install the Underground Aerial



ing its own problems.

For this aerial you should dig a narrow trench about one foot in depth, a length of about thirty feet or forty feet. The ditch should be as straight an level as possible.

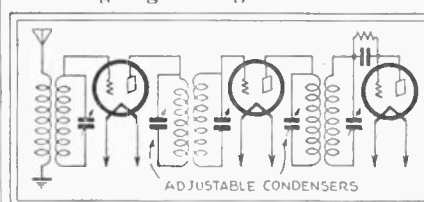
Heavy rubber insulated lead-in wire, such as No. 1664, should be used for the set lead. After you are sure there are no breaks in the rubber and the end of the wire is properly insulated, lay it in the trench as straight as you can get it. Then cover the wire with soil and connect to the set.

Some people find that connecting the underground aerial to the ground binding post, and the ground to the antenna post, the results are sometimes better. This aerial will also bring in distant stations better.

Suggested by:

**WILBUR G. HUDSON, JR.**  
753 De Graw Avenue  
Newark, N. J.

## Aligning Tuning Condensers



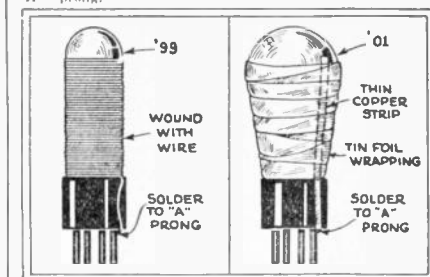
In matching two or more stages of radio frequency for one-dial control, I found that by using the ordinary method of adjusting the small adjustable condensers the tuning condenser did not "step" from the lower to the higher wave lengths. I noted that the antenna circuit tuned lower because of the change in the primary caused by the addition of the aerial. So I decided that the proper place to adjust the following stages was in the primary. I tuned them first by trial, using fixed condensers, then more easily and correctly by using the adjustable condensers, such as No. 1711. I believe this to be the best and most satisfactory method ever tried out, as it sharpens the tuning markedly, making the old broad tuning sets much more selective; and a larger primary may be used with a higher plate voltage, without affecting the selectivity. It has the main advantages that the setting of the tuning condensers, when ganged together, keep in "step" perfectly, because the ratio of minimum and maximum is not changed, as it is when matching with the usual adjusting condensers.

Suggested by:

**C. S. CLIP**  
Salineville, Ohio

## Killing Hum In Battery Operated Receivers

Those who are using battery operated radio receivers in the vicinity of electric light lines are often troubled by a 60 cycle hum which in many cases drowns out the weak signals. This hum is sometimes caused by magnetic induction or reaction on the detector tube. If you are using a type '99 or a type '32 you can remedy this trouble by winding a layer of wire on the bulb, binding it at the top, and connecting it to the "A" minus prong. For the 201A type tubes the glass may be covered with tin foil and connected to the "A" prong.



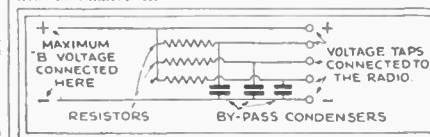
Suggested by:

**W. E. CARR**  
213 East Main Street  
Abingdon, Virginia

## Resistance Filter for "B" Batteries

Since in large multi-tube battery radio sets there are usually several different plate voltages required, so there is always an uneven load as well as bad interstage coupling on the several "B" batteries when the voltage taps are taken directly from them. Being a service man I have had requests for something to even up the load so all the batteries would run down at the same time and be replaced at the same time. Another practical use for the instrument is to enable more than one radio set to be used on the same "B" battery with only two "B" battery wires, running to each radio. Since the radio might be located some distance from the battery and would ordinarily require five or six wires, this system is economical because it requires only two.

The following diagram shows the material needed and how to connect it.



The resistance required for each voltage is calculated by the following method.

The voltage drop required is found by subtracting the voltage needed from the maximum "B" voltage.

$$\text{then } R = \frac{\text{voltage drop}}{\text{current in amperes}}$$

The current may be measured with a milliammeter and reduced to amperes by dividing by 1000.

It is best to use the semi-variable resistors such as the "Rite-Ohm", so the voltages can be finely adjusted by sliding the clip. When the voltage is being adjusted a high resistance voltmeter should be used because one of low resistance will cause too much of a voltage drop in the resistor.

The resistors and by-pass condensers may be put in a neat little box with binding posts for connecting, or they may be incorporated with the radio chassis.

Suggested by:

**WALLACE BLANKMEYER**  
Winifred, Montana

## Ford Coil As Speaker Coupling Unit

Here is a very simple way of connecting additional loud speakers to a radio set. A Ford spark coil is used. The primary of the coil which consists of a few turns of wire is connected in series with the voice coil of the loud speaker on the set, as shown. The additional speakers of the high impedance magnetic type may then be connected either in series or in parallel across the secondary of the coil, whichever way works best. By this means the impedances are fairly well matched and good tone quality results.

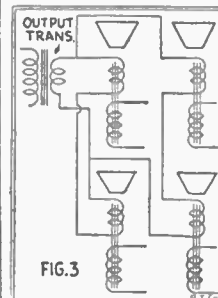
Suggested by:

**DOC OCKMEN**  
3209 Iberville Street  
New Orleans, Louisiana

Diagram illustrating a switch circuit for a speaker. The circuit includes an output transformer (labeled "OUTPUT TRANS. (IN SET OR SPKR.)"), a dynamic speaker (labeled "DYNAMIC SPKR. IN SET"), a voice coil, a field coil, and a magnetic speaker or inductor dynamic (labeled "MAGNETIC SPKR. OR INDUCTOR DYNAMIC"). The switch is controlled by a field coil and a voice coil, which are connected to the output transformer and the dynamic speaker. The diagram shows the electrical connections between these components, including a switch mechanism.

FIG. 1. SWITCH

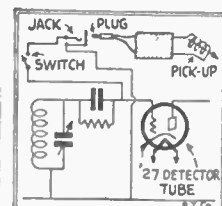
If it is desired to add an additional dynamic speaker to the set, then the circuit of Fig. 2 is recommended. In this case, the voice coil of the extra speaker is connected to the voice coil (or secondary) of the output transformer of the speaker in the set as shown. If the extra speaker has a transformer in it, this should be disconnected as it is not required. The use of the low voltage voice-coil wiring gives better tone quality, as the distributed capacity of the long leads has less effect than on the high voltage side of the transformer was used, as in Fig. 1.



If four speakers are to be used, it is recommended that a series-parallel circuit be employed, as the result of this will give an impedance that will be equivalent to that of one speaker. Fig. 3 shows the circuit.

### How to Connect Phonograph Pick-Up

The simplest method of connecting the common magnetic type pick-up to the set is to connect it to the grid and filament or cathode of the detector tube. To do this, a jack may be mounted on the set panel or chassis, one side of the jack being connected to the metal chassis or ground, and the other side connected to the grid of the detector tube. This connection should be as short as possible. The purpose of the connection will detune the detector stage, and the detector tuning condenser will have to be re-aligned for resonance. The pick-up may be plugged into this

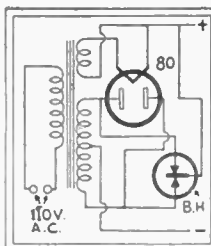


Suggested by:

H. W. WILKEY,  
440 E. Park Place, Peoria, Ill.

Suggested by:

### A Type 280 or "BH" Rectifier Used in Novel Circuit



While constructing a B supply unit I hit upon a method for using either a "BH" tube or a type 280 as a rectifier. I tried the method out and found it to work very well. The connections are shown in the diagram. They are standard with the exception of the use of two sockets but rare must be taken never to place the 280 tube in the "BH" socket. The sockets should be clearly marked

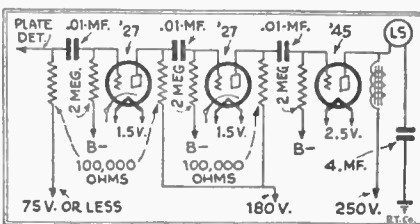
Suggested by:

GEORGE HEWITT  
915 Atlantic Avenue  
Brooklyn, New York

Most people desire a radio with a fine tone quality, and this cannot be secured with the old transformer coupling method using transformers of poor design, as found in many of the old battery sets.

In the accompanying diagram is an amplifier which I have experimented with and which has proved very satisfactory. It can be built in an old set easily and with little expense. All that is required is an additional tube socket in the audio amplifier and a few resistors and condensers, as follows:

- 3—100,000 ohm plate resistors such as No. 2230.
- 3—2 megohm grid leaks.
- 3—.01 mf. blocking condensers.
- 1—Output choke, such as the No. 1107.
- 1—4 mf. condenser, such as the No. 1705.



The diagram is self explanatory. It is obvious that this amplifier can be installed in any type of set, and the service man who improves the tone quality of his customer's radio will build up a priceless reputation.

Also many old radio sets regenerate and oscillate and are very critical in operation. While grid suppressors may relieve the trouble, a very simple method is to place one turn of bare copper wire around the 2nd or 3rd R.F. transformer coil. This turn should have the two ends connected together, forming a closed ring.

Suggested by:

ALLAN SHORT,  
101 State St.,  
Woonsocket, Rhode Island



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- ## Here are the HIGH SPOTS

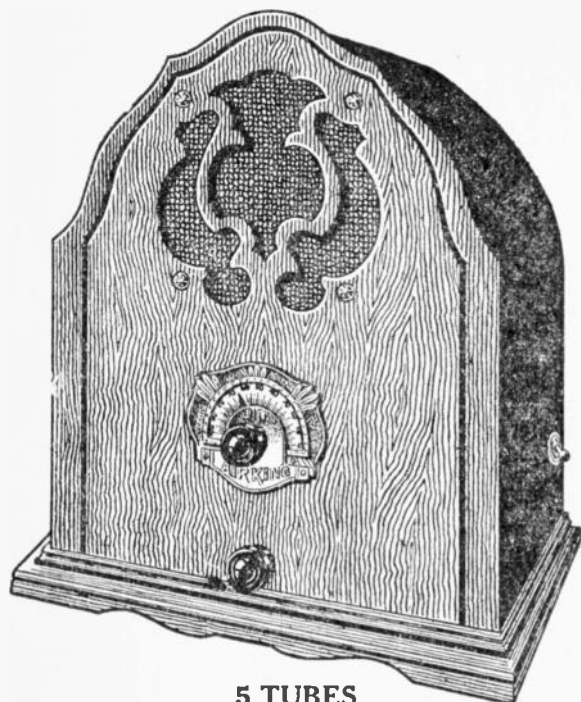
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1,253 Technical Illustrations  
34 Tables and Charts  
24 Pages of Appendix  
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352 PAGES  
Weight, 3 lbs.

Red Morocco-Kertol Flexible Binding

Printed on strong ledger paper  
Loose-Leaf Arrangement



## AIR-KING 5 TUBE MANTEL RECEIVER A Multi-Mu-Pentode Midget



### 5 TUBES MULTI-MU PENTODE WITH MAGNAVOX SPEAKER

Ingenious-Sensitive Circuit

In the receiver shown here, which must be called an "Infra-Midget" or by some similar superlative, the idea of lightness and portability is carried further than ever before in an electric set of loud-speaker output. It may be tucked under the arm and carried to any desired location without difficulty; yet, small as it is, it contains two multi-mu screen-grid tubes, one type 224 screen-grid tube, a super-power pentode, and a Magnavox 6" dynamic reproducer, all with their power supply and 280 rectifier. How the result is obtained is shown in the rear view at the right; the maximum baffling possibilities are realized by the central position of the speaker.

The first screen grid tube is used as an R.F. amplifier and is "ganged" to the second screen grid tube which performs as a **SPACE-CHARGE DETECTOR**. This method of detection is by far the most sensitive and most efficient means of separating the audio wave from the carrier. From the detector the signal is fed into the **SUPER-POWER PENTODE** which is in turn coupled to the dynamic speaker through a specially designed and **ACCURATELY MATCHED OUTPUT TRANSFORMER**. The entire circuit from antenna to speaker, is ingeniously designed for maximum selectivity, **INDISCIMINATING REPRODUCTION OF ALL AUDIO FREQUENCIES** and exceptionally fine fidelity of tone.

But interpreted in simpler terms, just what do these remarkable features in this multi-mu screen grid, pentode midget receiver bring you that has never been possible in a miniature radio before? They mean **AMAZING SELECTIVITY** and sensitivity. They mean **GREATER VOLUME**. They mean **FINER TONE**, finer performance and more enjoyable reception. Interruptions from powerful stations, **DISTORTION** and **INTERNAL SET DISTURBANCES** ARE ELIMINATED. Stations which you have never heard before are now added to your entertainment.

**DO NOT CONFUSE WITH INFERIOR MIDGET RECEIVERS**  
Since the advent of the midget type receiver, the market has been flooded with so called "reputable" midgets made by "well known manufacturers". Actually, however, these receivers are constructed of surplus merchandise which jobbers of radio parts have been unable to dispose of. We beg our customers not to confuse these inferior midgets with our high grade product which we absolutely guarantee against all mechanical or electrical defects.

### BEAUTIFULLY GRAINED TWO TONE CABINET

The Imperial Midget is put up in an attractive, beautifully grained cabinet which is entirely void of all gaudy designs or carvings. It is attractive in its simplicity, which seems to be almost the ultimate. Measures but  $14\frac{1}{2} \times 11\frac{1}{2} \times 8\frac{1}{2}$ ". Designed for 50-60 cycle, 110-120 volt A.C. Shipping weight 18 lbs.

List Price \$30.75  
No. 2570 AIR-KING 5-TUBE RECEIVER—complete with 5 Perryman tubes.  
**YOUR PRICE \$17.75**

BACK VIEW



**\$17.75**  
with  
**Perryman  
TUBES**

## Perry Multi-Mu Pentode Midget Receiver

1932 MODEL—EMPLOYING 5 LATEST TUBES

This Midget Receiver will equal and even out-perform many of its larger and more expensive brothers. Selectivity is obtained by the use of three tuned stages. High amplification is assured by multi-mu screen grid R.F. tubes, screen grid power detection and new super power pentode output. A Rola Full Dynamic Speaker gives wonderful reproduction with absolute fidelity of tone. So small you can put it anywhere or use it as a semi-portable. All you need is an electric outlet. Use it in the bedroom—den—library.

Contains every mechanical and electrical refinement, this modern small-piece set will appeal to everyone; for the adaptations of the "mantel" type radio receiver are legion.

### Full Vision Dial—Tone Control

The front of the Gothic-shaped cabinet is graced by three controls. One knob controls the combined "off-on" and "volume adjustments"; one is for tuning and the third is for tone control. A transparent, full-vision illuminated dial which is provided for tuning.

The two variable-mu screen grid R.F. stages (which entirely eliminates the possibility of "cross-talk"), are followed by a screen grid power detector; this feeds directly into the power stage of type 247 pentode tube. An efficient compact and dynamic reproducer is employed.

Other refinements are as follows: Electrolytic (self-healing) condensers; handy-grip, rubber-in-



sulated line plug, with five feet of line cord; three-gang variable precision condenser with built in trimmers; solid metal chassis; vitreous-enamelled resistors; tube shield compartments (preventing circuit oscillation); shielded R.F. coils (preventing station interference). Either an outside antenna or the built-in light-line antenna, may be used.

Designed for fifty-sixty cycle A.C. 110-120 volt circuits but may be had for 25 cycle 220 volt, at an additional cost of \$1.50. Dimensions  $16\frac{1}{4} \times 12 \times 9$ " deep. Shipping weight 23 lbs.

**THERE MAY BE CHEAPER MIDGETS ON THE MARKET. YOU ARE FULLY AWARE OF THIS. But if you want REAL quality, excellent workmanship—a set that is cheaper in the long run—this is the set we recommend to you and endorse. THERE IS NO GRIEF WITH THIS HIGH GRADE SET.**

COMPLETE  
With 5 Perryman or  
Speed Tubes  
**\$23.95**

List Price \$40.00

No. 2410 Perry Multi-Mu Pentode Midget Receiver  
**YOUR PRICE \$20.95**

**RADIO TRADING COMPANY, 25 WEST BROADWAY, NEW YORK, N. Y.**

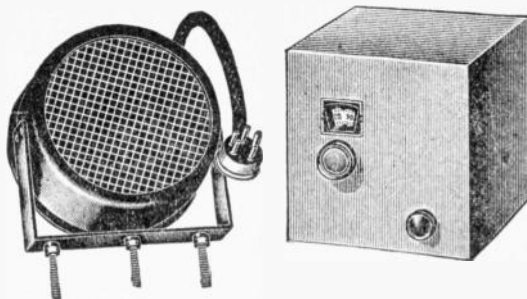
## AERO PENTODE AUTO RADIO

## EMPLOYS 6 NEW AUTO RADIO TUBES Greatest Buy in America

Now—a low priced radio for your automobile—a set of great power and efficiency—fine selectivity—long distance—in fact, embodying everything you would want in your home radio. Employs the latest type radio tubes especially designed to overcome that old snag in the development of auto radios in the past namely: battery fluctuations while the car is in operation. These automobile radio tubes are ruggedly constructed, incorporating exceedingly heavy cathodes, insensitive to battery fluctuations.

### EASILY INSTALLED AND OPERATED

The Aero Auto-Radio is an extremely compact 6 tube set which is easily installed in any car, bus or motor boat. The direct-drive model, illustrated here, may be clamped directly on the steering post or on the instrument panel and operated directly just as any ordinary receiver. The remote control model, however, may be tucked in any out-of-the-way corner of the car and operated by "remote control" from the dash board or any other convenient point. Both models employ 3 type 236 auto tubes as R.F. amplifiers, 1-236 as detector, 1-236 as 1st audio amplifier and a new auto pentode tube in the last power stage. An accurately matched 6 volt auto dynamic speaker engages the set chassis through a four conductor cable terminating in a special, polarized plug. Requires 3-45 volt "B" batteries to supply all "B" and "C" voltages to the receiver. The car's storage battery is utilized to light the filaments of the tubes. Fully shielded and shock-proofed in sturdy metal case.



Direct Control Model with Speaker

### SERVICE MEN—AN OPPORTUNITY FOR YOU

The New Aero Pentode Auto Receiver, eliminating as it does all objectionable features of previous automobile sets, creates a new, ripe field for this class of radio merchandise. At the price we offer them, you can easily re-ell them at a handsome profit. \$50.00 to \$75.00 was not an uncommon price for auto radios in the past.

Being large cash buyers of radio equipment, however, we are in an excellent position to produce this set at a price that enables us to help you make extra

money. By comparison, the Aero Auto-Radio performs as good as sets selling up to \$150.00. Yet you can buy the Aero set and speaker for only \$25.75, or if you want tubes, batteries, dynamic speaker and noise suppressors with it, the entire set costs only \$39.50 ready to install.

### Sells On Its Own Merits

No knowledge of salesmanship or of merchandising is required to make a sale. Merely set up a demonstration display. The Aero Auto Receiver sells on its own merits. It requires but few words to convince prospective customers of the pleasure—the companionship—the comfort of carrying with them on all trips as part of their car, a radio that will bring to them broadcasts from stations 1,000 miles distant, clear, distinct, undistorted, and with absolute fidelity of tone.

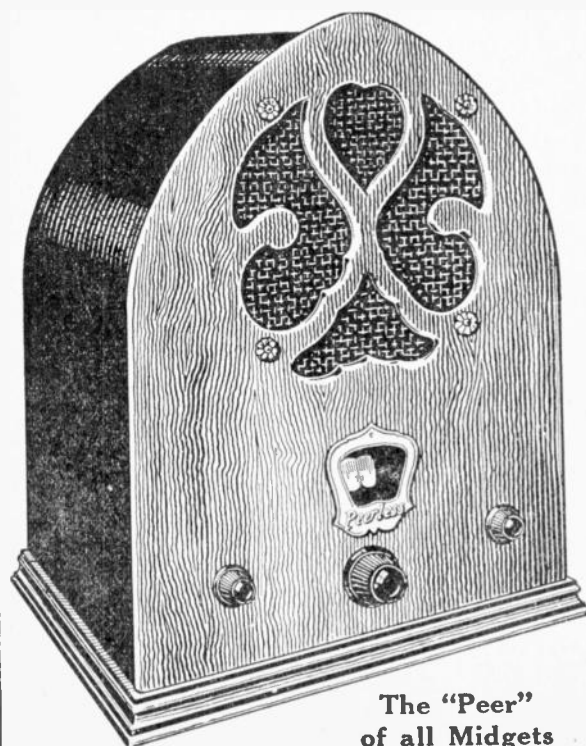
Aero-Auto Radio is the perfect set for any automobile, motor boat and motor bus. Combining as it does all the features of a high class radio with our astonishingly low price, this is unquestionably the outstanding bargain on the market today.

### ORDER TODAY!

Now that price is no longer a factor, take advantage of this unusual opportunity. You can order the set only and purchase the other equipment locally, or we can send you everything complete, ready to install in your car. Shipping weight 16 lbs. less accessories, 35 lbs with all accessories.

## PEERLESS HI-MU PENTODE MIDGET RECEIVER COMPLETE WITH 5 PERRYMAN TUBES \$17.75

### Remarkable Fidelity of Tone



The "Peer"  
of all Midgets

List Price \$35.00

No. 2550 PEERLESS HI-MU PENTODE MIDGET RECEIVER  
YOUR PRICE complete with tubes

New 1932 Model. Here is a receiver incorporating all the engineering features of next year's sets. FIVE TUBES ARE EMPLOYED. 1-screen-Grid 224, 2-Screen Grid Hi-Mu 235 and a SPECIAL SUPER-POWER PENTODE 247. A 280 full wave rectifier provides the operating voltages for the set. Not only is the circuit technically perfect but the component parts are so chosen as to eliminate all doubt as to the freedom of this receiver from the service worries of the earlier Midgets. Forget remote control and its manifold and expensive problems! Put one of these sensitive midget receivers at each strategic entertainment point in your home.

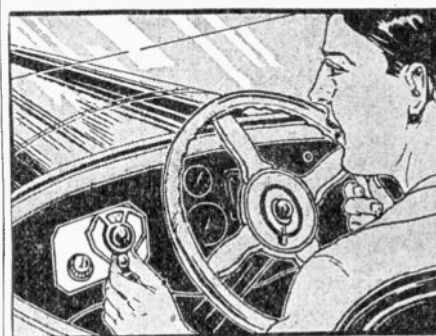
### OUTPERFORMS MANY 8 TUBE RECEIVERS

Due to the use of the latest pentode and multi-mu tubes this midget is equal and even better than many 8 tube receivers. The screen-grid 24 is the first R.F. amplifier tube feeding into the variable mu 35 which in turn feeds into a variable mu space-charge detector. The audio channel is of the resistance-coupled type and employs several very new principles of audio amplification, permitting true reproduction of all the musical frequencies without "cutting off". The super-power pentode is coupled to the full tone dynamic speaker through an accurately matched dynamic output transformer, affording exceptional quality of tone of both music and voice. It is highly selective as well as sensitive and will perform well on distance. Self-healing electrolytic condensers are used throughout to eliminate the possibility of condenser break-down.

### IN ATTRACTIVE MODERNISTIC CABINET

The decorative cabinet is beautifully two-toned and grained, with tasteful modernistic grill for speaker opening. Has four soft-rubber feet permitting the receiver to be placed on varnished or finished surfaces without scratching. Equipped with full vision tuning dial and beautifully etched escutcheon plate. Complete with full dynamic speaker. Shipping weight 23 lbs.

**\$17.75**



Remote Control Model

No. 2551 Aero Auto-Radio and Matched Dynamic Speaker for Direct Control. List Price \$40.00

**\$25.75**

### YOUR PRICE

No. 2552 Aero-Auto Radio with Matched Dynamic Speaker for Remote Control. List Price \$45.00

**\$29.25**

### YOUR PRICE

No. 2553 Aero-Auto Radio Direct Control. Complete with set of 6 tubes, 3-45 volt "B" batteries, antenna equipment and ignition noise suppressors. List Price \$65.00

**\$39.50**

### YOUR PRICE

No. 2554 Aero-Auto Radio Remote Control. Complete with set of 6 tubes, 3-45 volt "B" batteries, antenna equipment and ignition noise suppressors. List Price \$70.00

**\$41.75**

### YOUR PRICE

### Dumont Line Filter

A highly developed Low-Pass filter system for insertion in the line between the set and voltage supply. It is accord for attachment at base outlet and receptacle for connection of set. Completely eliminates all forms of "man made static" brought in over the supply line, such as motors, fans, belts, buzzers, electric refrigerators, etc. Interference from oil burners, sign flashers, door bells and medical equipment is prevented from reaching the set. For use on A.C. or D.C. lines. Shipping weight, 8 lbs.



List Price 5.00

No. 1843 Dumont Line Filter  
YOUR PRICE

**\$2.25**



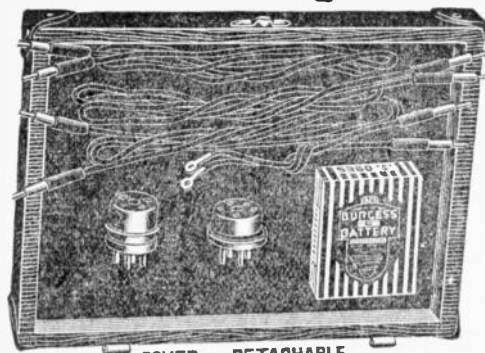
# NEW!

# NEW!

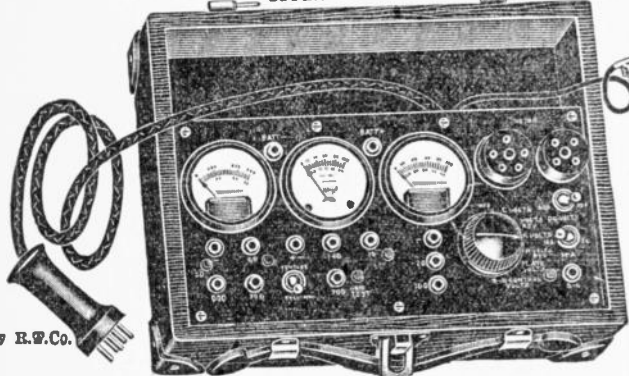
# NEW!

## IMPROVED READRITE MODEL 700 ANALYZER

### Complete \$14.70



COVER DETACHABLE



C by R.W.Co.

### MOST POPULAR LOW PRICED ANALYZER ON MARKET

This new Readrite precision instrument embodies features which have always been desired in any instrument built for service work: (1) low cost; (2) simplicity of design; (3) accuracy of measurements; (4) ruggedness of the complete unit. It is needless to add that the kit is capable of testing anything from old battery models to the latest screen-grid, pentode, and multi-mu receivers.

### EIGHT METER SCALES AVAILABLE

The "Model 700" is an extremely compact device. The outside dimensions of the carrying case are only 10 1/2 by 7 1/2 by 3 1/2 inches. The analyzer contains a D.C. voltmeter, an A.C. voltmeter and a milliammeter. The D.C. voltmeter has three ranges: 0 to 60; 0 to 200; and 0 to 600 volts. The A.C. voltmeter has also three ranges: 0 to 10; 0 to 140; and 0 to 700 volts. The milliammeter has two ranges: one for 20-mill. reading and the other for 100-mill. This variety of ranges makes it possible to test every conceivable radio circuit; high voltage secondaries of power transformers, current drain of all radio tubes including the high power 250 and 210 tubes, etc.

### CONVENIENT SELECTOR SWITCH

The instrument is equipped with a six-position bi-polar selector switch; by means of which readings may be obtained of ("") volts, "C" volts reversed, "K" volts, "K" volts reversed, plate voltage, and screen-grid control voltage. A 4 1/2-volt battery is supplied with the analyzer, to provide "C" bias, for grid tests, continuity tests, etc.

### TESTS PENTODES—"MULTI-MUS"—AND '80 RECTIFIERS

There are two sockets on the panel of the analyzer, one for four-prong tubes and the other for five-prong tubes. There is a "grid-test" push-button and pin jacks are available for the individual use of all meters, externally, in every range. There is a screen-grid pin jack, and there are two pin jacks for connecting the external battery. A two-way toggle switch throws the testing circuit directly for either regular tubes or pentode tubes. Both plates of the '80-type rectifier may be tested by use of the special adapter furnished. The cable leading from the analyzer terminates in a handy five-prong cable plug, small enough for making tests within automobile and midjet radio sets, and with which a four-prong adapter is furnished for plugging into UX sockets.

### MEASURES RESISTANCES AND CAPACITIES

By referring to handy charts supplied with each analyzer, it is possible to make accurate external measurements of resistances over a wide range of values and also to measure all the usual capacities encountered in radio receivers and amplifiers.

### IN LEATHERETTE CASE—REMOVABLE COVER

The Model 700 is contained in a handsome black leatherette case, substantially constructed and equipped with nickel corner-protectors and trimmings. By a novel hinge arrangement the cover of the case may be swung back and removed, thus affording a completely unobstructed view of the testing apparatus. This feature further makes it possible to hang or mount the analyzer on a wall or panel, creating thereby a real up-to-date panel test bench. In addition to being compact, the analyzers weigh very little, and can be carried long distances without causing fatigue. This feature will be welcomed by those Service Men who do not own an automobile.

### Free with each Analyzer

We take pleasure in offering with the purchase of each analyzer (either No. 700 or 600) — ABSOLUTELY FREE OF CHARGE — the latest radio publication to come off the press. This offer is made, not as an inducement to buy the analyzer (for this precision instrument hardly needs such an inducement) but rather as a let's-get-acquainted gift.

The book is the most important one of its kind ever to be issued. It fills a long-recognized want; for there is not a Service Man or a radiotician who has not an immediate use for this welcome book. It is the first that explains COMPLETELY the operation of analyzers, tube checkers, oscillators, etc., from a thoroughly practical standpoint. THE BOOK IS INTENDED CLASSES whether junior grade or expert. Everyone will find a tremendous amount of live "meat" in its pages. NOTHING HAS BEEN LEFT TO YOUR OWN INGENUITY; EVERYTHING IS COMPLETE. Contains detailed descriptions, photographs and circuit diagrams of all commercial set analyzers and testers.

A real book. Contains information on every analyzer on the market. 64 big pages. Heavy cover. Profusely illustrated throughout.

### TREMENDOUS SAVING FOR YOU

This type of service instrument usually sells wholesale for from \$25.00 to \$45.00. It is only the tremendous demand for an instrument of such character that permits its sale at this remarkably low price. The highly professional appearance of this test set adds to its value in its effect upon the customer as materially as its technical simplicity adds to its value as a time saving adjunct to the service engineer's kit.

Furnished complete with test leads, connecting cables, Burgess 4 1/2 volt battery, several battery leads, UY to UX adapter, '80 rectifier adapter, tube characteristic chart and resistance and capacity charts.

Shipping weight, 8 lbs.  
No. 700 Improved Readrite Model 700 Analyzer.  
YOUR PRICE

List Price \$35.00  
**\$14.70**

### Readrite No. 575 Output Meter



used to keep volume at an approximately constant value.

### HAS HIGH AND LOW RANGE

Low range connected across voice coil of dynamic speaker. High range may also be used for testing output of amplifier without use of speaker (either dynamic or magnetic) by connecting from plate to ground. Has a condenser incorporated in the high range circuit to prevent D.C. current from passing. A copper oxide rectifier is used. Complete with test leads. Baked enamel seamless case. Shipping weight, 1 lb.

List Price, \$6.00

No. 575 Readrite Output Meter  
YOUR PRICE

**\$3.60**

### Readrite No. 800 Capacity Meter

For Testing Paper and Mica Condensers



scale at 100 volts. Put up in a neat black enamel finished steel case and furnished with flexible test leads. Shipping weight, 1 lb. List Price, \$8.00  
No. 800 Readrite No. 800 Capacity Meter  
YOUR PRICE

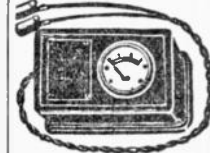
**\$4.80**

Gentlemen:

I am writing you in regards to a short-wave radio set that I bought from you about a month ago. I received pretty good results from it so far and am very well pleased with it.

Myles Swartley  
302 Chestnut Street Souderton, Pa.

### Preston Output Meter



Preston

### Output Meter

For use with Preston Oscillator. Used for trimming condensers, checking tubes by substitution method, adjusting detector voltages and other purposes. Recognized radio service men are now doing away with old slipshod methods of neutralizing oscillating receivers. Modern radio sets are so critically balanced that a split fraction of a micro-farad is usually sufficient to throw them off—resulting in squealing, howling noises. The visual method of determining balance—the output meter method—is by far the simplest and most accurate of all. The point of true balance or neutralization is obtained when the deflection of the needle is at its greatest.

List Price \$7.50

No. 2046 Preston Output Meter.  
YOUR PRICE

**\$4.40**

RADIO TRADING COMPANY, 25 WEST BROADWAY, NEW YORK, N. Y.



## Preston Set Analyzer and Tube Tester

Manufactured by Beede Instrument Corp.  
Improved 1931 Model

The Preston Set Analyzer has been designed to perform routine tests rapidly and has been simplified so that in nearly all cases, only one button need be pressed to get the desired reading. Since there is no selector switch, operation is greatly facilitated. Only a few points need be remembered as the use of the correct button for the desired result is quite obvious since they are individually marked and placed adjacent to their respective meters.

Will read plate current, plate voltage, grid voltage, filament emission grid test; grid test on 224 tubes; continuity test and resistance measurements. For finding open circuits and short circuits; will test capacity of condensers.

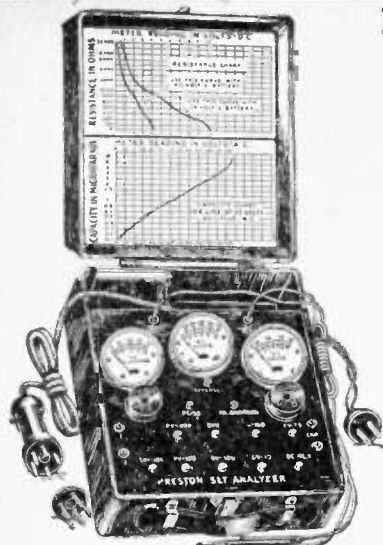
Equipment included with the Set Analyzer is as follows: 1-4 1/2 volt C battery. Cord and plug for A.C. line testing. 5 conductor cable and plug for connecting tester with radio set. 1-4 prong 5 hole adapter. Screen grid lead for connecting control grid on tube with pin jack to tester. Screen grid lead for connecting control grid on tube in tester to pin jack in tester. 1 pair leads with prods for continuity, resistance and condenser testing. Size 3"x9"x1 3/4". Shipping weight, 5 lbs.

List Price \$25.00

No. 2042 Preston Set Analyzer & Tube Tester

YOUR PRICE

**\$14.75**



### READRITE Set and Tube Tester



Here is a set analyzer for the service man which performs all the operations possible with the larger outfits. Three meters measure A.C. and D.C. voltages 0-10-140, D.C. voltages 0-60-300 (high resistance), D.C. plate current 0-20-100 m.a. Tests A, B, C, S-G and Cathode Circuits. Tests both plate and rectifier tube without circuit changes. Measures resistance up to 100,000 ohms and performs capacitance tests. Cover with handle forms handsome baked enamel carrying case. Complete instructions are furnished with this instrument together with charts illustrating the analysis of receiver circuits.

Tests all types of tubes, including screen grid and Pentodes. Shipping weight, 9 lbs. Overall dimensions, 4x8 1/2 x 3 1/2 in.

List Price \$20.00

No. 245A Readrite Set and Tube Tester

YOUR PRICE

**\$11.76**

### READRITE Counter Tube Checker



Here is a tube tester for the store, shop or laboratory which performs all the routine tests on vacuum tubes of any type. Screen Grid, Pentode or Rectifier. Eight sockets provide filament potentials for all modern tubes up to and including the 20 dry cell series. Plugs in on A.C. line to automatically provide all voltages. Push button gives change in meter reading for mutual conductance test. Charts provided show standard readings for all tubes. All apparatus is mounted in handsome shielded metal case.

Specify when ordering whether 50 or 25 cycle model is desired. Shipping weight, 5 lbs. Overall dimensions 4x8 1/2 x 3 in.

List Price \$20.00. 25 Cycle \$21.50

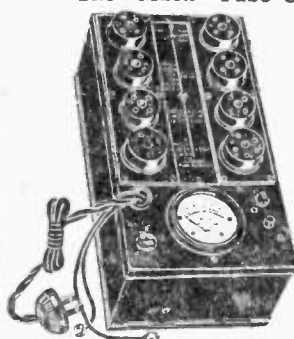
No. 400 Readrite Counter Tube Checker.

YOUR PRICE

**\$11.76**

**THERE IS  
CONVENIENT ORDER BLANKS FOR YOUR  
USE ON PAGE 70 AND 72**

### The "Mack" Tube Checker



This high quality instrument is intended for use at the store counter or in the service laboratory. Tests all modern tubes up to and including the new dry cell tubes and Pentodes. Filament and plate voltages are supplied by a high quality transformer direct from the A.C. line. Etched plate between the tube sockets allows an instant check on all tubes. Single BEEDE meter shows all readings. This is an extremely rugged tester capable of standing up over long periods of rough usage. Purchased for use on 110 v. 60 cycle A.C. line. Its handsome and business like appearance has a reassuring effect on the customer whose tubes are under test. No dealer or service man can afford to be without this device on his counter or in his service laboratory. The extreme demand for this instrument permits its quotation at this extremely low figure.

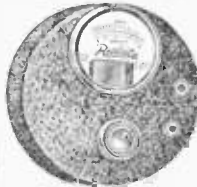
Shipping weight 10 lbs. List Price \$20.00.

No. 260 "Mack" Tube Checker.

YOUR PRICE

**\$11.75**

### READRITE Direct Reading Ohmmeter



This instrument is a complete direct reading ohmmeter mounted in a bakelite lacquer test case. Accurate resistance measurements up to 10,000 ohms are possible. The instrument will also act as a 0-4.5 volt meter. Zero adjustment is obtained by shorting the two leads and adjusting the rheostat. The instrument is provided with 3 foot probe leads for continuity tests. The instrument is indestructible in service work. High resistance shorts are readily shown up with this device. A small 4.5 volt flashlight battery is self contained. Case is 4 in. in diameter. Shipping weight, 2 lbs.

List Price \$6.00

No. 500 Readrite Direct Reading Ohmmeter.

YOUR PRICE

**\$3.53**

### READRITE Resistance Meter

This is the same meter as is used in the No. 500 Readrite Direct Reading Ohmmeter. This is a high grade 0-4.5 volt d.c. meter with a secondary scale calibrated directly in ohms. In operation the meter is connected in series with a 4.5 volt flashlight battery and the apparatus to be tested. Range 0-10,000 ohms. Instrument is in a flush mounting case with a black finish and nickel bezel. 4 in. diameter. Shipping weight, 2 lbs.

List Price \$2.50

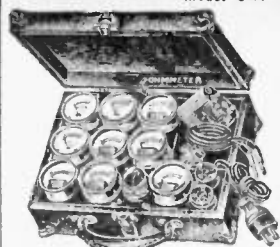
No. 50 Readrite Resistance Meter.

YOUR PRICE

**\$1.47**

### Readrite Radio Test Kit

Model 9-A



No. 9-A contains 9 meters fitted in tip jacks 0-50, 0-500, 0-8 D.C. 0-10, 0-150 A.C. voltmeters, and 0-10, 0-100, 0-300 milliammeters. Also No. 501 resistance meter with battery and extra tipped leads making use of rheostat for adjusting ohmmeter to zero. In black leatherette covered case nickel trimmed with leather handle, size 7x10 1/2" high. Has 4 meter tube tester connected with five-foot cord, plug and adapters. Also a five-foot polarity cable with tips for special test meter. Power rheostat, grid push button switch, four and five prong sockets with interchangeable meters all on marked Bakelite panel. Will make every usual test of tubes and circuits. Locates faults quickly without switches or other cord connections. A complete and flexible outfit every serviceman or experimenter will want to own. Shipping weight, 14 lbs.

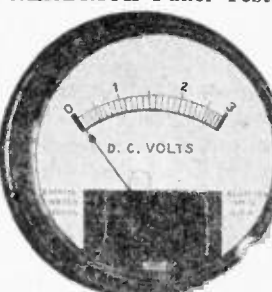
List Price \$35.00

No. 2041 Readrite Radio Test Kit

YOUR PRICE

**\$21.00**

### READRITE Panel Testing Meters



Readrite Instruments have earned a reputation for their unusual accuracy and reliability. The Panel Type, listed below, requires a hole 2 1/2-5-6 in. in diameter. Dials are special white enameled, easy to read.

All Readrite Meters are packed individually in attractive carboard boxes.

Cat. No.	Range	Panel D.C. Voltmeters	List Price	Your Price
335-0-8 volts			\$1.00	\$0.58
310-0-10 volts			1.00	.58
316-0-15 volts			1.00	.58
233-3-0-3 volts			1.00	.58
237-0-50 volts			1.00	.58
337-H-0-50 volts			3.00	1.77
339-0-100 volts			1.25	.74
339-H-0-100 volts			3.00	1.77
342-0-150 volts			1.50	.88
342-H-0-150 volts			3.00	1.77
346-0-300 volts			3.00	1.77
347-P-0-500 volts			4.00	2.35
246-P-0-60-300 volts			4.00	2.35

Cat. No.	Range	Panel A.C.-D.C. Voltmeters	List Price	Your Price
314-0-4 volts			\$2.50	\$1.47
353-0-6 volts			2.50	1.47
352-0-10 volts			2.50	1.47
351-0-15 volts			2.50	1.47
348-P-0-150 volts			4.00	2.35
247-P-0-600 volts			6.00	3.53
355-P-0-10-140 volts			4.00	2.35

Cat. No.	Range	Panel D.C. Ammeters	List Price	Your Price
326-0-3 amperes			\$1.00	\$0.58
238-0-10 amperes			1.00	.58
101-1-0-1 amperes			1.00	.58
303-3-0-3 amperes			1.00	.58
6060-6-0-6 amperes			1.00	.58
110-10-0-10 amperes			1.00	.58
220-20-0-20 amperes			1.00	.58

Cat. No.	Range	A.C. Ammeters	List Price	Your Price
363-0-1 amps			\$2.50	\$1.50
761-0-2 amps			2.50	1.50
362-0-5 amps			2.50	1.50
363-0-10 amps			2.50	1.50

Cat. No.	Range	Panel D.C. Milliammeters	List Price	Your Price
311-0-10 m. a.			\$1.75	\$1.02
325-0-25 m. a.			1.00	.58
350-0-50 m. a.			1.00	.58
390-0-100 m. a.			1.00	.58
399-0-300 m. a.			1.00	.58
394-0-400 m. a.			1.00	.58
395-0-20-0-100 m. a.			1.75	1.02



## READRITE Portable Meters



pulsating currents. The coils are wound on a Bakelite frame which houses the moving vane construction.

### D.C. Voltmeters (300 ohms per volt)

No.	Size	Range	List Price	Your Price
No. 446	3 in.	Case 0-60-300 volts	\$4.50	\$2.65
No. 750	3 in.	Case 0-750 volts	6.00	3.53

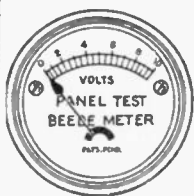
### D.C. Milliammeters

No.	Size	Range	List Price	Your Price
No. 225	0-25 m. a.	84 ohms	\$3.00	\$1.77
No. 2900	0-100 m. a.	5.5 ohms	3.00	1.77

### D.C.-A.C. Voltmeters

No.	Size	Range	List Price	Your Price
No. 348	0-150 volts		\$4.00	\$2.36
No. 349	0-300 volts		5.00	2.94
No. 248	0-150-750 volts		8.00	4.72

## Beebe A.C. Panel Meters



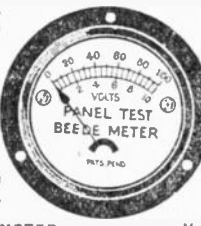
Constructed on the solenoid principle which means long and accurate life. Scales are even graduated so that readings may be accurately made at any point on the scale. Attractive in appearance and moderate in price, made with narrow flange as illustrated, fastened from the back, or with wide flange supported with screws in flange. Overall dimensions: narrow flange 2 1/4 in. Wide flange 2 1/2 in. Finish—Nickel, with silvered dial.

Cat. No.	Range	List Price	Your Price
725	0-3 volts	\$1.75	\$1.02
726	0-5 volts	1.75	1.02
727	0-7 1/2 volts	1.75	1.02
728	0-150 volts	3.00	1.77

## Beebe D.C. Panel Meters

For Panel Mounting.

Made with narrow flange and fastened from the back, or with wide flange (as illustrated) supported with screws in flange. Diameter of hole in panel 2 1/32 in. Overall dimensions: narrow flange 2 1/4 in.; overall dimensions: wide flange 2 1/2 in. Finish—Nickel, with silvered dial.



Cat. No.	Range	List Price	Your Price
729	0-4 volts	\$1.50	\$0.88
730	0-7 volts	1.50	0.88
731	0-150 volts	3.00	1.77
732	0-300 volts	3.00	1.77

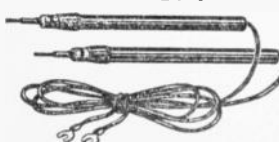
  

Cat. No.	Range	List Price	Your Price
733	0-5 millamps.	\$1.50	\$0.88
734	0-10 millamps.	1.50	0.88
735	0-30 millamps.	1.50	0.88
736	0-75 millamps.	1.50	0.88
737	0-100 millamps.	1.50	0.88

Cat. No.	Range	List Price	Your Price
738	0-3 amps.	\$1.50	\$0.88
739	0-5 amps.	1.50	0.88
740	0-10 amps.	1.50	0.88

## Test Leads

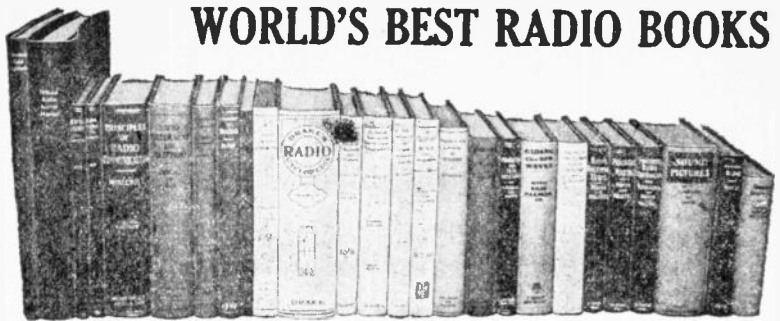


3 1/4 foot flexible leads equipped with test probes color-coded for polarity. This is one piece of equipment which no service man can afford to be without. The tips are made of non-corrosive metal and are of the solderless type, permitting for inserted for special purposes without much bother or waste of time. Insulated grips made of genuine polished Bakelite (not fibre) protect operator from shock when making measurements in high voltage circuits. Shipping weight, 1/4 lb.

List Price \$1.00  
YOUR PRICE

**\$0.40**

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Here is the most complete collection of recent important radio books. We have, after an exhaustive study, selected these volumes because they represent the foremost radio books of their kind in print today. There is such a great variety that we are sure it will satisfy any taste as well as any requirement that the student of radio might have.

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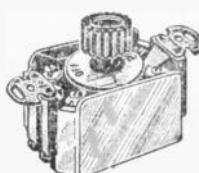
**TELEVISION, Its Methods and Uses**, by E. H. Felix. Here is a highly interesting book that delves deeply into the heart of television and brings forth many illuminating ideas, facts and predictions. It probes to the very bottom of the science and then commences to analyze in proper sequence, all the theory and fact that essentially is television—a clearcut, concise explanation and discussion of television today. Bound in dark-green cloth; 5 1/2 x 8", 266 pages, generously illustrated. Shipping wt. 2 lbs.

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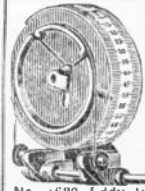
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This switch is for use with power transformers which are tapped for various line voltages. They are also adapted to many uses as change over switches in the service shop. A heavy duty power switch. Shipping weight, 1 lb. Overall size, 1 1/2 x 2 1/2 x 2 1/2". No. 1642 Stromberg Carlson Three Way Snap Switch.

YOUR PRICE **\$0.25**

## Eddy Drum Dial



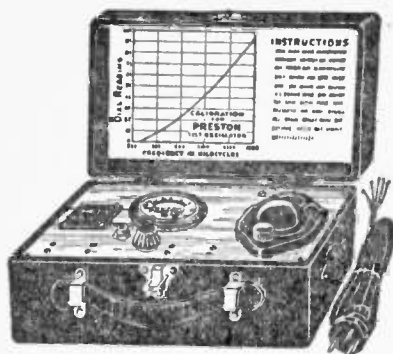
A drum type dial complete with celluloid tuning scale with 100 divisions and dial light brackets. Made by the famous Eddy Manufacturing Company. For 1/4" shaft which is 1 1/4" long. Die cast construction with phosphor bronze cable and automatic stop adjustment make this dial particularly free from service worries. Screw take up for tension adjustment. Shipping weight, 2 lbs. Overall size, 5 1/2 x 2 1/4 x 1 1/4".

No. 1680 Eddy Drum Dial.

YOUR PRICE **\$0.80**

# New Oscillators and Analyzers

## NEW! NEW! Preston Test Oscillator



### Preston Dynatron Oscillator

Radio frequency circuits in both T.R.F. and super-heterodyne sets must be adjusted to greater accuracy than is possible by the use of the broadcast wave as the test signal.

The Preston test oscillator covers the broadcast band from 550 to 1500 kilocycles, instructions being supplied however, for testing and adjusting super-heterodynes. The operation is very simple and is free from body capacity. A calibration chart and wiring diagram are supplied with each outfit, being permanently attached to the cover of the carrying case. An extremely valuable instrument for the service man.

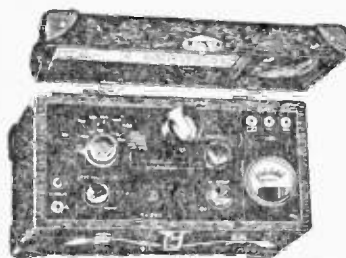
Two tubes of the '32 type are employed; one as a radio frequency oscillator and the other as an audio modulator. Dry cells supply both A and B voltages to the oscillator through a five conductor cable and five prong plug, the latter engaging a UY socket mounted on the side of the carrying case. Comes complete in a sturdily constructed leatherette carrying case with highly polished trimmings. Measures 6 1/2 x 2 1/4". Shipping weight, 5 lbs.

List Price \$20.00

No. 2045 Preston Test Oscillator  
YOUR PRICE

**\$11.75**

## NEW! NEW! Readrite No. 550 Oscillator



A necessary servicing oscillator for adjusting R.F. and I.P. circuits. Built to high standard. Fully shielded with separate battery compartment. A multi-ported instrument which covers the BROADCAST BAND 550-1500 KC. AND THE INTERMEDIATE BAND FROM 120-185 KC. Furnished with 22 1/2 V. and 3 V. batteries. One '30 type tube is used. Shielded cable connects to set. Cable is carried in the removable case cover in which is also attached full operating instructions and wiring diagram. Very compact. All parts are sturdily and strongly built to remain permanently accurate. Adjustment of intermediate circuit made with trimmer condenser through panel.

Used to align R.F. gang condensers, locate defective R.F. transformers, adjust I.P. transformers, check oscillator stage and determine sensitivity of a receiver. A modern instrument for new and old model receiving sets. In leatherette case 6 1/2 x 2 1/4" with removable cover. Weighs but 8 lbs. Shipping weight, 9 lbs.

List Price \$30.00

No. 550 Readrite Oscillator—less output meter

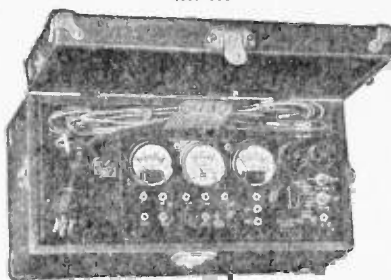
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List Price \$35.00

No. 551 Readrite Oscillator—Complete with output meter in panel

YOUR PRICE **\$20.58**

## No. 600 Readrite Analyzer No. 600

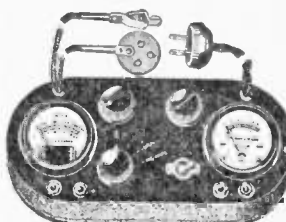


The No. 600 contains the same equipment as No. 700. The carrying case is larger, with leatherette covering and equipped with lock. Room is provided for carrying tubes, tools and supplies. The test equipment and panel is in a removable tray in the top of the case. The tray equipment may be used separately as complete test panel for shop purposes. With each purchase the new radio publication "Radio Set Analyzers" will be given Free of charge. Read more about this offer in the description of the No. 700 Analyzer listed elsewhere. Size 14 1/2 x 7 1/2". Shipping weight, 12 lbs.

List Price \$30.00

No. 2040 Readrite Analyzers No. 600  
YOUR PRICE **\$17.64**

## Readrite No. 850 Capacity Tester A Direct Reading 0.008-10 mfd. Instrument



This Capacity Tester contains one A.C. and one D.C. Meter. BOTH KINDS OF PAPER AND ELECTROLYTIC CONDENSERS MAY BE TESTED. The A.C. meter will test the capacity of paper or mica type condensers from .008 to 10 mfd. Connects to A.C. supply line of 100-135 volts, 60 cycles. A rheostat adjusts the full scale voltage to 100. A toggle switch connects meter for reading upper or lower scale. Test leads plug into jacks directly under meter for connecting to condenser. Meter reads directly in microfarads.

### SPECIAL PROVISIONS FOR TESTING ELECTROLYTIC CONDENSERS

The D.C. Volt-Milliammeter is used for testing and "forming" electrolytic condensers. Connection is made with the wafer adapter to the plate of a rottler tube and the clip attached to the set chassis. The selector switch is moved to the "VOLTS" position and the meter set to 300 volts with the use of the Rheostat. The next position of the selector switch provides for forming the condenser. ELECTROLYTIC CONDENSERS WHEN NEW OR LEFT OUT OF SERVICE FOR A PERIOD OF TIME REQUIRE FROM 15-20 MINUTES CONNECTION IN CIRCUIT TO PROPERLY FORM ITS CHEMICAL DIELECTRIC FILM BEFORE TESTING. The plus (+) jack connects to the anode and the minus (-) jack to the can container of the condenser. Test one anode at a time. The "FORM" position of the selector switch connects meter for reading corresponding to 100 M.A. full scale. Condensers starting to form in excess of 100 M.A. (electrolytic condensers, both wet and dry, will pass a gradually diminishing current until fully "formed" when the current ceases entirely) are defective with a short. A good electrolytic condenser should start forming at about the "HIGH" position on the meter scale and gradually reduce as the forming continues until no further change in meter takes place. After the required time for forming has been allowed and the meter reading stops at near zero the exact M.A. reading should be taken by moving the selector switch to the MIL-AMPS position. Electrolytic condensers should show up to 2 M.A. per microfarad. Variable or fluctuating meter reading would indicate a defective condenser. Attractively put up in baked enamel steel case. Shipping weights

List Price \$15.00

No. 850 Readrite Capacity Tester—less cover and handle

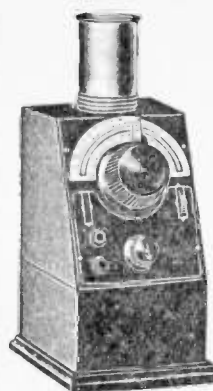
YOUR PRICE **\$8.82**

List Price \$17.00

No. 851 Readrite Capacity Tester—with cover and handle

YOUR PRICE **\$10.00**

## The New Acrocycle Oscillator A Dependable Miniature Broadcast Station



There is an oscillator every radio service man has been waiting to buy. Easily adjusted to produce a signal of any desired frequency and power, in either broadcast or super-heterodyne intermediate ranges for use in testing, comparing, and adjusting all kinds of radio receivers, either in whole or by stage.

### NOTE THESE ADVANTAGES

Direct true reading scale, permitting pointer to be easily set to any desired scale reading with a precision well within plus or minus 1/10 of one percent. No calibration curve to bother with and add to probability of error.

EACH INSTRUMENT CALIBRATED TO READ CORRECTLY at all points of the scale with an allowable error of less than 1/2 of one percent.

Abundance of power for accurate readings, with extra strong signals available when necessary, as in neutralizing, by simply thrusting the antenna lead to the bottom stop of the ant. jack. Full vision dial, EXTREMELY SHARP TUNING. No body capacity effects when operated according to instructions. BY THE 68 TO VERNIER, which also makes possible the hair line accuracy in setting. Produces fundamental frequencies from 115 to 280 KC and harmonics from 230 to 1680 (sixth harmonic of 280) KC and higher.

The scale for fundamental KC has a division line for each KC up to 200 and beyond 200 a line for every 2 KC. Consequently all super-heterodyne intermediate frequencies adopted by manufacturers to date, fall exactly on a scale line, where the pointer is most easily set accurately, and so do all the RMA and IRE standard adjusting broadcast frequencies—600, 800, 1000, 1200, and 1400 KC. However, the divisions over the entire scale are large and clear enough to permit settings to any fractions of KC that can be judged with reasonable accuracy by the eye of the operator. Quick shifts from one part of the scale to another are easily made by turning the large knob.

Manufactured and backed by a corporation of many years experience in the radio field and known throughout the world as makers of high grade radio devices. Meas. 8 1/2 x 1 1/2 x 5 1/2" deep. Shipping weight, 4 lbs.

List Price \$30.00

No. 2043 The New Acrocycle Oscillator **\$17.12**

YOUR PRICE Less Carrying Case and Batteries

## Carrying Case for New Acrocycle Oscillator

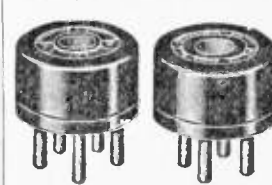
A strong leatherette-covered wooden box with substantial nickel plated lock and clasp and a sturdy leather handle. Special provisions are made for carrying an output meter besides the oscillator. Measures 6 1/2 x 1 1/2 x 5 1/2" inches. Shipping weight, 4 lbs.

List Price \$3.00

No. 2044 Carrying Case for The New Acrocycle Oscillator **\$2.10**

YOUR PRICE

## Analyzer and Tube Tester Adapters



The UX to UY adapter is used for testing grid and plate voltages on five prong A.C. sockets with D.C. testers and analyzers. It has four holes on top and five prongs on bottom.

The UY to UX adapter permits five prong A.C. tubes to be tested in D.C. testers and analyzers provided with UX or UY sockets. It has five holes on top and four prongs on bottom. A set of these adapters, in conjunction with any 0-10 A.C. voltmeter (to test A.C. filament voltages) is all that is necessary to completely adapt your old D.C. testing equipment or analyzer to modern A.C. receivers. Adapters are of well moulded Bakelite throughout, with non-corrosive metal prongs. Shipping weight, 1/4 lb.

List Price \$1.00

No. 1865 UX to UY Adapter

YOUR PRICE **\$0.59**

No. 1866 UY to UX Adapter

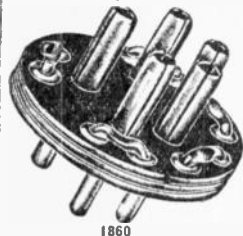
YOUR PRICE **\$0.59**



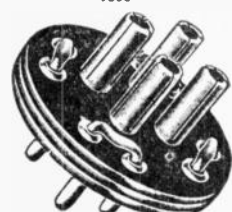
# HELPS FOR THE SERVICEMAN

## Radio Servicemen's Universal Adapter and Trouble Finder

10 Adapters Built Into One Compact Unit



1860



1861

**BREAKING OR SOLDERING REMOVING THE CHASSIS.**



1862



1863

There is a unique, ingenious unit which faithfully performs all the numerous functions of ten different adapters, giving quick access to all the radio circuits in a receiver. It opens filament circuits for neutralizing squealing sets, automatically inserts grid suppressors in grid circuits of oscillating set, thereby stabilizing them, inserts voltmeters and ammeters in any desired circuit, adapts phonograph pick-ups and microphones for electrical reduction, adapts earphones and additional loud speakers to receivers already having a speaker, connects output meters to any of the audio tubes and finally provides a means of making positive electrical contact with any circuit in the receiver; all this, mind you, **WITHOUT A SINGLE WIRE OR**

The secret of the manifold uses of this universal adapter lies in the manner of its construction. Here's the donee: From the illustration above it would appear that the prong receptacles and their respective prongs are directly connected right through the adapter. They are not; and that's the whole essence of the thing. Prong receptacle and prong are two completely independent units. Wire leads from each one of them, however, are brought out to external pin jacks on the periphery of the adapter and there connected by a special connecting link. The removal of any given link breaks the contact between the receptacle and its prong, thereby opening that particular circuit.

For example, if the connecting link marked "P" on the adapter, is removed, the plate circuit of the tube is opened. With the plate open it becomes a simple matter to insert a milliammeter by merely making contact with the two pin jacks vacated by the connecting link. For this purpose you may use either the connecting cords shown above, our Nos. 1862 and 1863 which are equipped with the special connecting link tips or else any other wire or cord which will fit the pin jacks.

To balance squealing, oscillating receivers, all that is necessary is to insert the proper adapter, either UY or UY in the UY sockets, remove the grid connecting links and insert the ends of flexible grid suppressors in the vacated pin jacks.

If it is desired to make an electrical contact with any of the tube circuits, the grid for instance, merely pull out the connecting link (i.e. break the circuit) of the grid prong and insert the connecting link of our No. 1863 Dual Connector Cord. This automatically completes the circuit on one more, but in addition establishes an electrical connection to the grid of that tube.

Prong receptacles and prongs are made of tempered phosphor bronze metal and are firmly set into a disc of heavy insulating fibre. The most ingenious, most efficient, most useful piece of apparatus ever developed since the advent of radio. Two models are available: a four-prong UY adapter and a five-prong UY adapter. Two types of connecting cords, specially manufactured for these adapters, also available: single cord and connecting cords. Shipping weights of cords and adapters are 8 oz. each.

List Price \$1.75

No. 1860 UY Universal Adapter and Trouble Finder  
**YOUR PRICE \$1.07**

List Price \$1.75

No. 1861 UX Universal Adapter and Trouble Finder  
**YOUR PRICE \$1.07**

List Price \$0.40

No. 1862 Single Connector Cord  
**YOUR PRICE \$0.20**

List Price \$0.50

No. 1863 Dual Connector Cord  
**YOUR PRICE \$0.25**

## Na-ald "Lock Feature" Handle Plug



Here is the latest, most ingenious and most practical development in the field of radio plugs and adapters; a development which is the outcome of a crying need of service men and experimenters. A new handle plug with an ingenious locking feature which **COMPLETELY ELIMINATES THE OLD TIME-CONSUMING PROCESS OF ATTACHING ADAPTERS TO HANDLE PLUGS WITH SCREWS**. Simply insert the plug into the adapter. It locks itself securely and automatically. Snap the release button in the handle of the plug and the adapter slides off, simple yet efficient. Every Service Man should have his analyzer or test bench with this new plug. Available in the UX and UY types both with and without test cables. Cable for the UX type comprises 6 braided wires. Four wires connected to prongs, one to screen grid and sixth to center tap. The cable for UY type comprises six wires too, five to prongs and the sixth to screen grid. Shipping weight 1 lb.

No. 1890 New Analyzer Plug UX type.  
List Price \$3.00 **\$1.50**

**YOUR PRICE**  
No. 1891 New Analyzer Plug UY Type.  
List Price \$3.00 **\$1.50**

**YOUR PRICE**  
No. 1892 New Analyzer Plug UX Type with 5 Ft. Cord.  
List Price \$5.00 **\$2.50**

**YOUR PRICE**  
No. 1893 New Analyzer Plug UY Type with 5 Ft. Cord.  
List Price \$5.00 **\$2.50**

**YOUR PRICE**  
No. 1894 Additional Cable for New Plug.  
List Price \$0.30 ft. **\$0.18**

**YOUR PRICE**  
No. 1895 UX to UY Adapter for use with UX Type Handle Plug. Cathode Circuit Connected to Center Post.  
List Price \$1.25 **\$0.80**

**YOUR PRICE**  
No. 1896 UY to UX Adapters for use with UY Type Handle Plug.  
List Price \$1.25 **\$0.80**

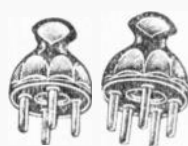
**YOUR PRICE**  
No. 1896 UY to UX Adapters for use with UY Type Handle Plug.  
List Price \$1.25 **\$0.80**

## New Pentode Adapter

Replaces Type 45 Tubes with Pentodes  
A new and simple device for replacing the old 45 type power tube with the latest super-power pentode. The replacement is effected without rewiring or changing any part of any circuit of the receiver or amplifier. All the necessary changes are ingeniously incorporated in the adapter unit itself. All that is necessary is to remove the 45 power tube, insert the adapter in its vacated socket and then place a pentode tube in the socket of the adapter. Gives a dead life and power to old receiver and amplifiers as well as better fidelity of tone. Measures 1 1/2" x 1 1/2" diam. Shipping weight, 1 lb.

No. 1873 New Pentode Adapter  
**YOUR PRICE \$0.65**

## 4 and 5 Prong Bakelite Dynamic Speaker Plugs



These plugs are ideal for making external connections to dynamic speakers. The five prong plug is used for coupling dynamic speakers to receivers and amplifiers. The four prong plug is used for coupling dynamic speakers to output transformers in the field coil and the remaining three for the push-pull output transformer in the speaker. The four prong plug is utilized where the output is a single power tube; two prongs being for the field coil and two for the output transformer in the speaker.

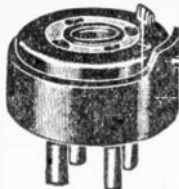
## HAVE MANY OTHER USES

Here are several other suggested uses for this handy plug: Coupling amplifiers to external tuners, coupling battery sets to eliminators and power packs, making test cables for analyzers and testers and a host of other uses. Plugs are made of well moulded Bakelite with surigrip handle and non-corrosive metal prongs. Cables are easily attached to these plugs by simply unscrewing the base which contains the prongs, soldering the wires and then resetting the base. Snap, neat, compact. Shipping weight, 1/4 lb.

List Price \$0.35  
No. 1570 5 Prong Dynamic Speaker Plug **\$0.25**  
**YOUR PRICE**

No. 1571 4 Prong Dynamic Speaker Plug **\$0.25**  
**YOUR PRICE**

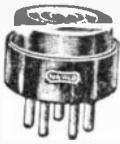
## Oscillation Control Adapter



We recommend this adapter, to servicemen, experimenters and set owners as a sure cure for squealing and oscillating sets. It has a small slot or jack in the top of it through which a special Na-ald grid suppressor (one supplied with each adapter) can be slipped. This adapter automatically places grid resistor in series with the grid of the tube. Stabilize your set by plugging an oscillation control adapter in all the H.F. Sockets. Resistors are made in values of 500-600-700-800-1000 ohms. Specify which resistor when ordering. Adapter is of well moulded Bakelite throughout with non-corrosive metal prongs. Shipping weight, 1/4 lb.  
List Price \$1.25  
No. 1864 Oscillation Control Adapters **\$0.73**  
**YOUR PRICE**

## Neutralizing Adapters

For UX and UY Tubes

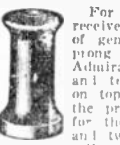


Here is an adapter which is indispensable to every serviceman, radio technician and experimenter. When placed in the socket of any tube it automatically opens the filament circuit, thus permitting all squeals and oscillations caused by that tube to be properly balanced out—neutralized. No service outfit, shop or laboratory is complete without them. Adapters are made of well moulded Bakelite throughout with non-corrosive prongs. Shipping weight, 1/4 lb.

List Price \$1.00  
No. 1867 UX Neutralizing Adapter **\$0.59**  
**YOUR PRICE**

No. 1868 UY Neutralizing Adapter **\$0.59**  
**YOUR PRICE**

## Bakelite Speaker Plug



For coupling dynamic speakers to radio receivers, public address systems, etc. Made of genuine moulded bakelite with detachable prong base which screws securely to the case. Admirably adapted for test cables or analyzers and test benches. Cable engages the grille on top of the handle and follows through to the prongs. Two of the prongs are reserved for the full supply of the dynamic speaker and two for the output transformer or voice coil. Engages the standard type UX socket, insuring a positive electrical contact. Shipping weight 1/4 lb.  
List Price \$0.65  
No. 1583 Bakelite Speaker Plug **\$0.25**  
**YOUR PRICE**

## I.C.A. Ear Phone Adapter



A new Ear Phone Adapter specially designed for use with the new electric sets. Can also be used with battery model sets. One can now listen to DX at any time without disturbing the rest of the family. In order to use the Ear Phone Adapter in use, take out the Power Tube of set, insert the Ear Phone Adapter in place of tube, and then insert one tip of ear phones in specially provided connector. The volume desired, either loud or soft, can be regulated from the volume control of the set. In cases where the set has two Power Tubes in Push Pull, take out both Power Tubes, insert the adapter in either socket and operate accordingly. Finished in Bakelite, complete with Cord and Connector. Handsome and efficient. Shipping weight, 1/2 lb.

List Price \$1.50  
No. 1696 I.C.A. Ear Phone Adapter **\$0.88**  
**YOUR PRICE**

## NA-ALD ALL-PURPOSE ADAPTERS Universal Pick-Up Adapter



A unique adapter for connecting electric phonograph pick-ups to vacuum tube sets. It fits UX and UY sockets and can be used with either four or five prong tube—a truly universal adapter. Base is made of insulating fibre, split on one side to give it spring action. Tip is made of tempered, non-corrosive metal. Shipping weight, 1/4 lb.

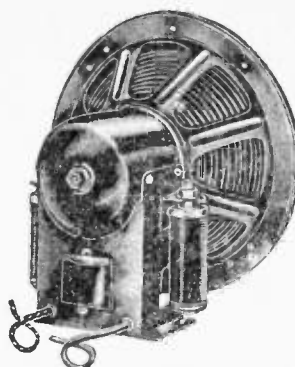
List Price \$1.00  
No. 1722 Universal Pick-Up Adapter **\$0.68**  
**YOUR PRICE**

# MARVELOUS VALUES IN LOUD SPEAKERS

**NEW! NEW!**  
New Utah Dynamic Speaker  
110-20 Volts 50-60 Cycles A.C.



**Utah 12" Stadium Dynamic Speaker**  
110 Volts 25 and 60 Cycles A.C.



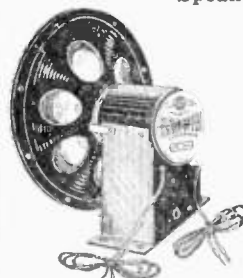
A superior, heavy duty unit embodying all the fine principles of construction and operation of the 9" Utah Model 33A but having many times more its volume. Designed especially to be a common date large theatres, halls, armories and outdoor stadiums. Just the speaker for public address systems and outdoor gatherings. Sold complete-ready to connect to your receiver or amplifier and to the 110 volt A.C. 60 cycle lighting lines.

Includes an output step-down transformer, WESTINGHOUSE RECTOX DRY-DISC, HEAVY-DUTY RECTIFIER, for the field coil supply, and cord and plug for attachment to the lamp socket. The special, high-quality output transformer is designed to match the voice coil impedance thereby insuring perfect and equal production of all the musical frequencies. A five foot cord is furnished with the instrument for connection to the speaker output terminals of the set or amplifier.

Size, 12" high, 12" wide and 7 1/2" deep. Highly finished in nickel plating, with adequate holes for mounting. A special 12" corrugated cone insures strength and durability under the most powerful operating conditions. Capable of handling tremendous amount of volume without distortion. These speakers are available for either 60 cycle or 25 cycle A.C. operation, also one for direct current at 110-220 volts with output push-pull transformers. Shipping weight, 24 lbs. **YOUR PRICE**

No.	Model	List Price	PRICE
1516	110 Volts 60 cycle A.C.	\$30.00	<b>\$11.35</b>
1517	110 Volts 25 cycle A.C.	35.00	<b>\$12.00</b>
1518	110-20 Volts D.C. 2,500 ohm field, Push-Pull	25.00	<b>\$8.25</b>

**Nathaniel Baldwin D.C. Dynamic Speaker**

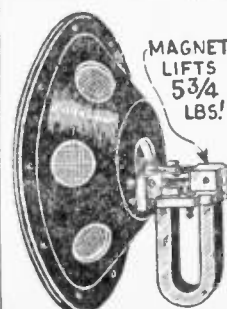


This is a brand new addition to the famous Baldwin line of acoustical apparatus. Never before has a speaker of such small size offered such fidelity of response. 9" diaphragm. 2500 ohm field winding with 15 ohm voice coil. For use across D.C. line or with field coil acting as filter choke in power supply circuit. Furnished without coupling transformer. Shipping Weight, 10 lbs.

List Price \$12.00

No. 1513 Baldwin D.C. Dynamic Speaker **\$4.75**  
**YOUR PRICE**

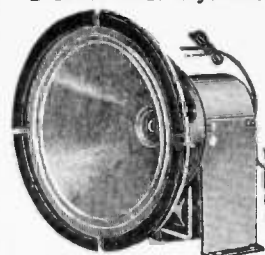
**B.B.L. 9" Cone-Magnetic Reproducer**



MAGNET  
LIFTS  
5 3/4  
LBS!

used. The diameter is 9 1/2 in., and the depth, 6 in. List Price, \$14.95. **\$3.25**  
No. 1509A B.B.L. Speaker.  
**YOUR PRICE**

**T.C.A. D.C. Dynamic Reproducer**

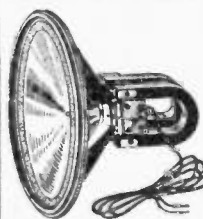


An excellent dynamic speaker with a 2500 ohm field winding and a moving coil having an impedance of from 10 to 15 ohms. A special material cone of this speaker gives exceptional response throughout the entire range of musical frequencies. Built in output transformer for either single or push-pull output tubes is included. Has 8 1/2" diaphragm. Field winding may be used across D.C. supply line, as a choke in the power supply, or it may be fed with rectified A.C. from a small "B" Eliminator. An excellent speaker for either home or auditorium requirements. Shipping weight, 10 lbs. Over-11 Size, 8 1/2 x 9 1/2".

List Price, \$20.00.

No. 1515 T.C.A. D.C. Dynamic Reproducer. **\$5.75**  
**YOUR PRICE**

**"Farrand" Inductor Dynamic Speaker**



No. 1511 Farrand Inductor Dynamic Speaker (9" diameter)

**\$7.45**  
**YOUR PRICE**

No. 1512 Same (12" diameter) **\$8.95**  
**YOUR PRICE**

**RCA 100B-103 Magnetic Speaker Chassis**



This chassis is the identical one used in the RCA Model 100 A and 103 Speakers. WHICH LIST FOR AS HIGH AS \$30.00. Note built-in OUTPUT TRANSFORMER—permits use of 450 volts, without distortion, rattling or blasting. GENEROUS OVER-SIZED MAGNETS. The thick armature is ACCURATELY CENTERED. THE STURDY METAL FRAME IS LINED WITH A SPECIAL SELF-BAFFLING FABRIC, greatly improving acoustic properties of this sensational speaker. NOTE THE CORRUGATED SURFACE OF THE CONE, AN EXCLUSIVE FEATURE—ENHANCES PERFECT TONAL REPRODUCTION. QUALITIES CONSIDERABLY MOST COMPACT.

LY MADE: 9 INCHES OUTSIDE DIAMETER, 4 1/2 INCHES DEEP OVER ALL. Weight 4 lbs.

List Price, \$13.00

No. 1502—RCA Speaker Chassis. **\$3.25**  
**YOUR PRICE**

**R.C.A. Loud Speaker 103**



A beautiful speaker in appearance. Superb in its ability to reproduce music and speech most faithfully. The frame and pedestal are mounted to resemble hand-carved oak, while the beautiful tapestry medallion conceals the mechanism and completes the decorative design of the instrument. Magnetic unit. Corrugated cone. Height, 15 in., width 13 1/4 in., depth 6 1/2 in. In factory sealed carton. Shipping weight, 14 lbs.

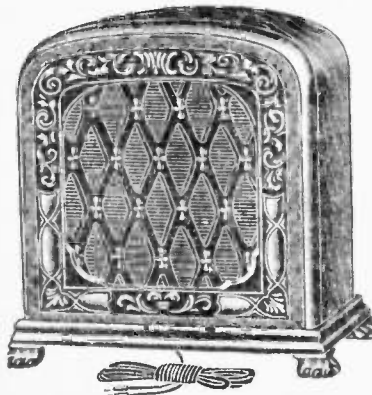
List Price, \$22.50

No. 1505 R.C.A. 103 Speaker. **\$4.70**  
**YOUR SPECIAL PRICE**

The latest Utah speaker development incorporating some radically new principles in modern dynamic speaker design and construction. Employs smooth line-tube rectification of A.C. current for field supply, utilizing the stable BII type rectifier tube. Capable of handling enormous volume with absolute tone fidelity. Adaptable for use in home, theatre, large hall and for outdoor service. Magnetically constructed on strong metal chassis, aluminum plated for appearance and durability in all weather conditions. A well filtered, hum-bucking field circuit insures freedom from all traces of objectionable hum. Voice coil impedance is 6 ohms at 400 cycles and is accurately matched with the self contained output transformer for most faithful reproduction of all essential musical frequencies (30 to 6,000 cycles). The New Utah Dynamic Speakers are available in two sizes, 8" & 10" both of which can be supplied for all standard output tube arrangements. However, unless otherwise specified we will ship speakers with standard output transformers with 4,000 ohms (400 cycles) impedance for single tube, or 8,000 ohms (400 cycles) center tapped (2,000 ohms) per side for push pull receivers or amplifiers. Complete with B.H. Rectifier Tube. Shipping weight, 15 lbs.

No.	Description	List Price	YOUR PRICE
1536	8"—Single Output Transformer	\$17.50	<b>\$11.80</b>
1537	8"—Push-Pull "		
1538	10"—Single Output Transformer	\$18.50	<b>\$12.25</b>
1539	10"—Push-Pull "		

**Kolster Magnetic Speaker**  
MAGNIFICENT WALNUT CABINET



No effort was spared by the famous Kolster organization to make this one of the finest speakers in existence. The Kolster cabinet embodies a very popular design, and is exquisitely finished in soft rich walnut. A finely patterned grille work, backed by beautiful gold cloth, greatly enhances the appearance of the cabinet. An unusual and distinctive touch are the metal feet, beautifully finished in gold. 12 1/2 in. high; 12 in. wide; 7 in. deep. Shipping weight, 11 lbs.

List Price, \$35.00

No. 1501 Kolster Speaker. **\$4.50**  
**YOUR PRICE**



## PEERLESS DYNAMIC REPRODUCERS

For A.C.-D.C. and Battery Operation

25-60 Cycles

This is the famous Peerless reproducer which has long been considered the peer of all dynamic speakers. The complete line of reproducers listed here gives a model for every purpose, from the large auditorium type down to the diminutive storage battery model used for automobile receivers. Ruggedly constructed of high grade material. Equipped with output transformers which accurately match the voice coil impedance, and specially designed floating cones. The A.C. types are available with either dry disc rectifiers or 80 tube rectifiers. The D.C. models may be used as either first or second chokes or else may be energized by A.C. receivers which are equipped to supply "B" current to dynamic speaker fields. All models may be had with a choice of either 575, 1000, 2000, or 2500 ohm field coil. Specify which when ordering.



14" A.C. Model

**\$14.90**



9" D.C. Model

**\$5.10**

REGULAR C.TOCK SIZES

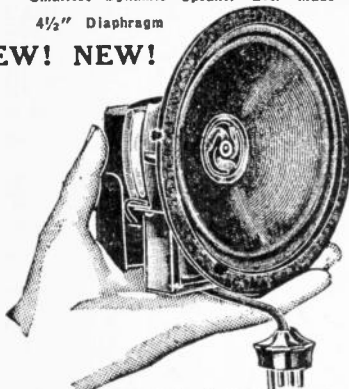
		For D.C. Operation		
No.	Size	Ship. Wt.	List Price	YOUR PRICE
1528	9"	12 lbs.	\$11.50	<b>\$5.10</b>
1527	11"	13 lbs.	12.50	<b>\$5.93</b>
1528	12"	26 lbs.	15.50	<b>\$8.33</b>
1529	14"	26 lbs.	17.50	<b>\$10.05</b>
		For 60 Cycle A.C. Operation		
No.	Size	Ship. Wt.	List Price	YOUR PRICE
1530	9"	17 lbs.	\$16.50	<b>\$9.98</b>
1531	11"	18 lbs.	18.00	<b>\$10.80</b>
1532	12"	31 lbs.	22.50	<b>\$13.20</b>
1533	14"	31 lbs.	24.00	<b>\$14.90</b>
For 25 cycle operation add \$0.50 to above prices.				
		For Battery Operation		
No.	Size	Ship. Wt.	List Price	YOUR PRICE
1534	6 volts-7"	12 lbs.	\$11.50	<b>\$5.10</b>
1535	6 volts-9"	13 lbs.	12.50	<b>\$5.93</b>

### "Little Giant" Dynamic Reproducer

Smallest Dynamic Speaker Ever Made

4 1/2" Diaphragm

**NEW! NEW!**



Here is the latest "offspring" in the family of midget dynamic speakers. A lusty-throated, full-voiced "infant" capable of out-shouting many of its larger and more expensive brothers. Measures but 6 1/2" overall, having a 4 1/2" diaphragm and weighing but 4 lbs. Because of its lightness and compactness, this speaker is admirably adapted for use on midget, portable and automobile receivers. **EQUIPPED WITH OUTPUT TRANSFORMER**, the secondary winding of which is accurately matched to the low impedance of the voice coil insuring faithful reproduction of all audio frequencies without discrimination or distortion. **EXCELLENTLY SUITED FOR A.C. PORTABLE RECEIVERS**

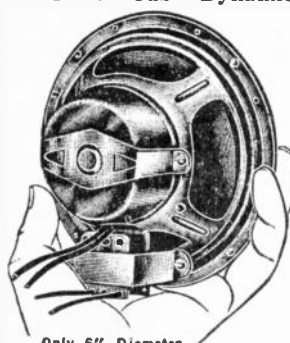
Just as with the Utah "Cub" Dynamic Speaker, described elsewhere, this reproducer is excellently suited for use with A.C. portable receivers. Its adaptability lies in its **2500 OHM FIELD WINDING WHICH IS EMPLOYED AS A FILTER CHOKE IN THE POWER PACK**. The "B" current, as it flows through the field coil not only energizes it but is itself smoothed by all ripples by the hum-bucking properties of the high inductance. The voltage drop through the field is approximately 100 ohms at 40 mil. **THIS METHOD OF FIELD EXCITATION SAVES THE WEIGHT AND EXPENSE OF A HEAVY CHOKE COIL IN THE POWER PACK AND OF A RECTIFIER AND STEP-DOWN TRANSFORMER WERE THE SPEAKER TO BE ACTIVATED BY ALTERNATING CURRENT.**

Read what Mr. Hugo Gernsback, Editor of Radio Craft, says elsewhere of the Utah "Cub" dynamic speaker. The same is applicable to the "Little Giant". The difference in price between the "Cub" and the "Little Giant" lies in the fact that the former is totally shielded and aluminum plated to guard against rust, while the latter is only partially shielded and is merely enameled with battleship-grey paint. Both, however, possess the same fine characteristics of performance under load. We heartily recommend both these speakers to all those who are at all interested in the art of radio construction and repair.

Sold complete with output transformer but less cable and plug. These latter two may be had at a small additional cost. Specify when ordering the type of power tube or tubes in conjunction with which the "Little Giant" is to be used. Shipping weight, 5 lbs. 1 lb. Fr. \$9.00

No. 1549 "Little Giant" Dynamic Reproducer **\$2.50**

### Utah "Cub" Dynamic Speaker



Only 6" Diameter

thereby serving a double purpose. This last feature makes the Cub Speaker exceptionally suited for portable A.C. electric sets, since it does away with filter chokes and thus with considerable weight. Equipped with an output transformer which matches the impedance of the voice coil and insures utmost fidelity of reproduction. Built on a sturdy, lightweight, nickel-plated chassis.

Mr. Hugo Gernsback, editor of RADIO-CRAFT magazine recently constructed a remarkable new set, "The A.C. Pentode Portable." This receiver uses only two tubes and of course the Utah "Cub" Dynamic Speaker. Now see what Mr. Gernsback says in the September, 1931 issue of RADIO-CRAFT.

#### ASTONISHING VOLUME

That a single screen-grid tube, in conjunction with a Pentode, can operate a dynamic loud speaker, will at first seem improbable. That such a combination actually out-performs, in point of volume, a modern five- or six-tube midget set, will probably tax your credulity; but, nevertheless, these are the facts.

The present combination, which we believe has not been used before, is really remarkable for the results that can be accomplished. Some of the New York locals came in with such power that this little, insignificant, nickel-plated room apartment with music that could be heard loud and distinct; and when it was turned on full, it was impossible for two people to converse with each other in the same room.

We warmly recommend this combination to radio experimenters and builders.

Shipping weight, 8 lbs. List Price \$10.00  
No. 1519 Utah "Cub" Dynamic Speaker **\$3.40**

**Exciter for Giant or Junior Horn Unit**  
Type No. M200



Used with above dynamic units on 110 A.C. 50 to 60 cycles. Size 6 1/2 in. x 6 in. x 4 in. Humless! All Electric! All dry Exciter! Will not overheat! Good for 1 to 3 horn units. Shipping weight, 12 lbs. List Price \$30.00  
No. 1542 Exciter for Giant or Junior Horn Unit **\$17.64**

### Miles Giant Dynamic Horn Unit

Type No. M100



This unit must not be confused with other so-called Giant Units. Even a cursory comparison will bring out the marked advantages of our M100. It is in reality a GIANT, for its net weight is 21 lbs. and its net dimensions are 5 1/2" x 5 1/2" x 5 1/2". The diaphragm—the heart of the unit—is absolutely unbreakable which is an exclusive feature only found in MILES.

Designed especially for theatres, parks and all kinds of Public Address installations, indoors and outdoors. In use in conjunction with large exponential horns.

#### TREMENDOUS POWER OUTPUT

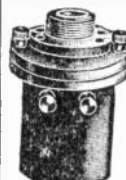
This Giant Dynamic Horn Unit is capable of handling any power output of 10 to 30 watts un distorted. Field supply is 1.1 amps. at 6 volts D.C. Source of supply may be either a 6 volt storage battery or a Miles Exciter No. 102 for 110 A.C. listed elsewhere (No. 1532). The Voice coil has an impedance of 10 ohms at 50 cycles. Special output transformers Nos. 103 and 104 (listed elsewhere) are available for matching this unit to the power amplifier. (Transformer M103 for 250 power amplifiers, Transformer M104 for 245, or 210 power amplifiers.) Shipping weight, 23 lbs. List Price \$100.00

No. 1540 Miles Giant Dynamic Horn Unit **\$37.25**

YOUR PRICE

### Junior Dynamic Horn Unit

Type 200



Operates in the same manner as the giant unit. Field consumption 1/2 amps. at 6 volts D.C. Used indoors and outdoors. Exceptionally powerful for its size. Operates from any amplifier most satisfactorily! All low and high notes of the entire musical scale faithfully reproduced! Particularly recommended for smaller installations, also for lodges, classrooms, hotels, factories, funeral parlors, stores, etc. Net weight, 5 lbs. Net dimensions, height 4 1/2 in., diameter 3 1/2 in. Shipping weight, 8 lbs. List Price \$35.00

No. 1541 Junior Dynamic Horn Unit **\$20.25**

YOUR PRICE

### Output Transformers For Giant and Junior Dynamic Horn Units



Dynamic output transformers, especially designed to match the floating coil of the Miles Giant and Junior Dynamic Horn Units.

Type N. M. 103 for 250 push-pull amplifiers. Ratio 25 to 1. Primary 4000 ohms, secondary 10 ohms. Size 3" x 5" x 5". Shipping weight 8 lbs.

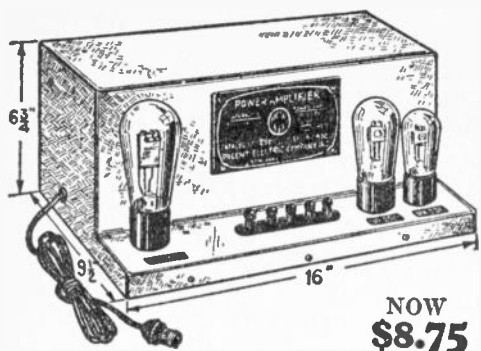
Type N. M. 104 for 45, 10 and 71 amplifiers. Ratio 25 to 1. Primary 2000 ohms, secondary 10 ohms. Size 3" x 3" x 3". Shipping weight 3 lbs.

No. 1493 Stepdown Transformer Type M103. List Price \$22.50 **\$6.75**  
YOUR PRICE  
No. 1494 Stepdown Transformer Type M104. List Price \$15.00 **\$5.65**  
YOUR PRICE

RADIO TRADING COMPANY, 25 WEST BROADWAY, NEW YORK, N. Y.

# PACENT "250" POWER AUDITORIUM AMPLIFIER

## One of the Most Powerful Super Power Amplifiers ever made.



**CONTAINS 2 STAGES SUPER POWER A.F. AMPLIFICATION**

Ideal for theatres seating approximately 3,000 people, dance halls, schools, lectures, hospitals, auditoriums, outdoor gatherings, etc., etc. The gigantic power is at all times within control—for that matter it can be used in any home, as the volume can be regulated down to a whisper! But most important of all, the QUALITY OF REPRODUCTION IS AS NEAR PERFECT AND LIFE-LIKE AS POSSIBLE! ITS POSSIBILITIES CAN BE SUMMED UP IN THREE WORDS: ABSOLUTELY DISTORTIONLESS VOLUME!! The full benefit of the 450 volts produced is obtained.

**A PHONOGRAPH AMPLIFIER—PUBLIC ADDRESS AMPLIFIER—RADIO TUNER**

When you remove it from its shipping crate, all you need do is to insert the necessary tubes, PLUG INTO ANY 60 CYCLE A.C. 110 VOLT ELECTRIC SOCKET and connect the input binding post. Either a radio set tuner output, a phonograph pick-up, "phono-movie" or microphone arrangement can be easily adapted to this amplifier.

Notice Dimensions of this Jumbo Amplifier. Use of the "26 tube in the input stage makes the long "warming up" period unnecessary—operation starts immediately after switching on. Careful design keeps the hum level at an absolute minimum—(46 decibels below normal output).

The qualified service man can use this as a power supply unit for radio receivers by employing a separate 2.5 volt transformer for the receiver filaments and taking "B" and "C" voltages from the voltage divider of the Amplifier. This merely requires the use of a tapped resistor in place of the bleeder resistance found in the amplifier run.

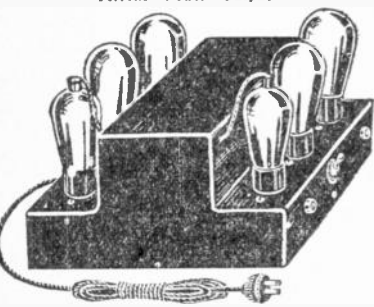
Shipped ready for operation but less the three tubes. Shipping weight, 30 lbs. Overall size, 16x9 1/2 x 6 3/4 inches. List Price, \$90.00.

No. 1925 Pacent Model 250 Power Amplifier. **\$8.75**

YOUR PRICE

## Double Push-Pull Loftin-White Amplifier

Uses 2-'24's and 2-'250 in Double Push-Pull Terrific Power Output



With the presentation of this new giant 250 double push-pull amplifier, incorporating the famous direct-coupled Loftin-White circuit, we offer the electrical recording and public address fields the most powerful, most efficient and most practical amplifier ever placed on the market. Employs two '21 screen-grids in push-pull feeding into two powerful '50's which are also in push-pull. A truly remarkable circuit. Two '81's are used for full-wave rectification.

### OPERATES 6 TO 9 DYNAMIC SPEAKERS

Has an undistorted output of more than 18 watts; enough to operate 6 to 9 full-size dynamic speakers at one time. It is the ideal amplifier for theatre work, large auditoriums and field or airport work. Is adaptable for microphone, phonograph and radio input. (Can readily be used as a line booster and speech amplifier in broadcast work.)

### FURNISHES COMPLETE A-B-C VOLTAGES FOR TUNER

In appearance, the amplifier looks just as neat and as business-like as the most expensive jobs. All component parts are firmly bolted to the chassis and shielded against electrical disturbances. Due to the conservative rating of the power transformer, bleeder resistance, etc., all the A-B-C voltages essential to the operation of an A. C. radio tuner may be tapped directly from the amplifier. This arrangement eliminates the necessity of employing a separate power supply for the tuner when used in conjunction with the amplifier. Shipping weight, 32 lbs.

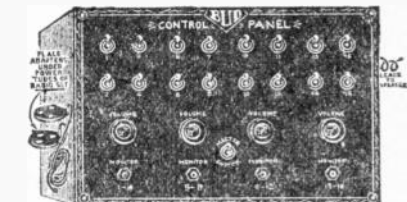
List Price \$65.00

No. 1904 Double Push-Pull Loftin-White Amplifier. **\$33.00**

YOUR PRICE

## Bud Centralized Public Address Control Panel

For Wiring Schools, Hotels, Hospitals, Lodge Rooms, Club Rooms, Restaurants and Homes.



**BUD CONTROL PANEL** is the answer to a SIMPLIFIED and INEXPENSIVE CENTRALIZED RADIO or PUBLIC ADDRESS DISTRIBUTION SYSTEM. Additional amplifiers or boosters are not necessary to operate a BUD CONTROL PANEL system. Only a radio set of standard make, preferably with push-pull audio used in conjunction with a BUD CONTROL PANEL will give excellent volume on from one (1) to sixteen (16) speakers.

The operator may at will give or discontinue radio service to any speaker or number of speakers by simply snapping the toggle switches ON or OFF.

You will note that a volume control is used with each group of speakers, so that you have individual control of the volume and may raise the volume on one group of speakers where necessary or reduce volume on another group as the occasion may arise.

### Built-In Monitors

A Monitor Jack is provided for each group of four (4) speakers, namely 1 to 4, 5 to 8, 9 to 12, and 13 to 16, so that the operator can talk from the remote position just how much volume is being transmitted to the speakers in each group. A master switch is provided to turn off the whole system without having to touch the individual switches.

This installation of BUD CONTROL PANEL is extremely simple. Knockout holes are provided for on the right side of the Control Cabinet to bring your leads through to the terminal strip. Shipping weight 10 lbs.

List Price \$40.00

No. 1920 Bud Public Address Control Panel. **\$19.50**

YOUR PRICE

## Microphone Suspension Springs



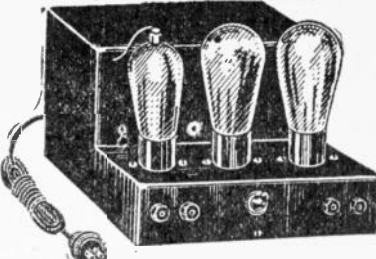
For suspension of microphones in rings, desk mounts, floor stands, etc. Includes "carbon rush" noises in microphones to an absolute minimum. Eight are generally used per set. List Price, each 10c

No. M325 Microphone Suspension Springs **\$0.05**  
Set of Eight **\$0.35**

YOUR PRICE

## Loftin-White 245 Amplifier

### Original Direct-Coupled Circuit



An efficient, inexpensive amplifier, embodying the original Loftin-White principle of direct coupled amplification. This in effect, does away with A.F. transformer, choke-condenser, resistor-condenser and similar conventional methods of vacuum-tube coupling which more or less "cut off" audio frequencies which are out of the range of their inherent natural frequency. The elimination of these discriminating coupling mediums insures FAITHFUL REPRODUCTION OF ALL THE MUSICAL FREQUENCIES WITH REMARKABLE FIDELITY OF TONE.

### DO NOT CONFUSE WITH CHEAP IMITATIONS

The market today is being flooded with cheap "Loftin-White" amplifiers selling for as low as \$8.50 or thereabouts. These units are constructed by means of surplus merchandise with material which they have been unable to dispose of. We beg our customers not to confuse these cheap imitations with our own Loftin-White product which we guarantee against all mechanical and electrical defects.

**FOR RADIO MICROPHONE AND PHONO WORK**

Affords more than sufficient volume for most dance halls, schools, small auditoriums, etc. The very finest of parts only are used—made by the most renowned and reliable makers. A splendid phonograph amplifier! Can be used with Loftin-White tuner or any other type tuner. Requires one 224—one 245—one 280 tube. Self-contained ABC supply. Also furnished all ABC voltages to any 2 1/2 volt A.C. tuner.

When used with a microphone, no additional amplification is necessary. This is due to the inherent characteristics of these amplifiers. The high impedance secondary of the "mike" transformer automatically increases the gain of this system and compensates for the low input voltage of the microphone.

The output of the Amplifier rates from 1 1/2 to 2 watts. Sufficient for operating 2 to 3 dynamic speakers. For 110 volts 60 cycles. 6 1/2 in. deep, 8 1/2 in. high, 9 in. long. Shipping weight, 22 lbs.

No. 1903 Loftin-White 245 Amplifier—Completely Assembled (less tubes) **\$15.00**

YOUR PRICE

## New Pentode Loftin-White Amplifier

Operates 4 to 5 Dynamic Speakers

In this new Amplifier the amazing power and many advantages of the recently developed "PENTODE" power tube have been utilized to the greatest extent. The result is a small, compact unit of unbelievable power and unflinching performance. For phonograph reproduction, this model can be relied upon to deliver sufficient volume to fill a hall containing up to 1500 people. The tone quality of which this amplifier is capable is comparable only to the music's original rendition. **DISTORTION HAS BEEN COMPLETELY ELIMINATED** together with feedback noises and other amplifier ills. The amplifier **CAN BE TAPPED FOR A-L A-B-C VOLTAGE** necessary to operate an A.C. tuner. It is truly a remarkable achievement in sound equipment.

### AN OPPORTUNITY FOR SERVICE MEN

To the wide-awake Service men, who recognize the possibilities of this amplifier, the opportunities for profit-making are unlimited. A Pentode Amplifier, an electric turntable and an electric phonograph pick-up comprise a sound installation that can be easily sold for use in dance halls, skating rinks, theatre lobbies, confectionery stores, amusement parks; in fact, wherever better music is needed for public entertainment. The low price of the new Pentode Amplifiers now for the first time, puts them within reach of the smallest business man.

The Pentode Loftin-White Amplifiers can be used as microphone amplifiers for public address work. Employs 1-'24, 1-'47 pentode and 1-'80 rectifier. A microphone input transformer completes the unit; no additional amplification being necessary. The output of this Model is from 6 to 8 watts, undistorted. Shipping wt., 22 lbs.

List Price \$5.00

No. 1907 New Pentode Loftin-White Amplifier **\$20.00**

YOUR PRICE

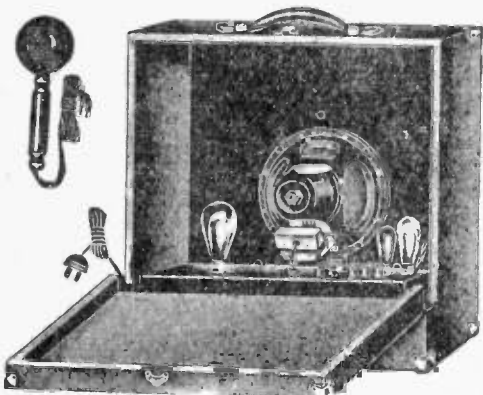
Gentlemen:

I am writing to inquire for some order blanks, as I would not part with my radio catalog No. 23 for a good bit, and you deserve a great credit for same, as there is more useful information contained in same, than several magazines put together. Thanks for my copy, and I will be looking forward to any other radio information you may send.

W. F. Entrikin  
R. D. No. 1  
West Chester, Chester Co., Pa.



**Comprises Microphone, Pentode Amplifier and Full Dynamic Speaker**



**Complete With Transverse Current Microphone**

The portable Address system is sold complete with the new line Ampion transverse current and microphone. This unique device (described more fully elsewhere) contains no metal diaphragm, carbon buttons or moving parts. It is energized by a transverse current which is modulated by the reciprocating action of a silk cloth diaphragm against fine carbon granules. A 100% improvement over the conventional carbon button type microphones—completely eliminating the annoying "carbon hiss". Gain control is provided for "mike" input.

### Compact in Leatherette Carrying Case

The complete equipment is entirely shielded against

### Quickly Pays for Itself

The low-priced but efficient public address system is fast becoming an important factor in our every day industrial and social lives. Service men and dealers are now renting and selling amplifiers for use in schools, clubs, hotels, banquets, plays, lectures, dances, etc.

The complete system comprises a power amplifier, and two theatre type dynamic speakers, all mounted in suitable leather carrying cases; additional speakers can be operated, if necessary.

The amplifier is contained in a separate leather carrying case 14 1/2" x 11 1/2" x 4 1/2" in size, with a volume control and has an output of 46 units of 16 watts; enough to operate a unit with four speakers, all operating at one time. Tubes used are 5-227, 2-250 and 2-281, and will supply ample volume for gathering up to 10,000 people.

The speaker assembly is composed of two theater type dynamic speakers, assembled in a leather carrying case, mounted in the center of the front and back of the assembly and located in various positions. The speakers have an interconnecting cable and 50 feet cable which connects with the amplifier.

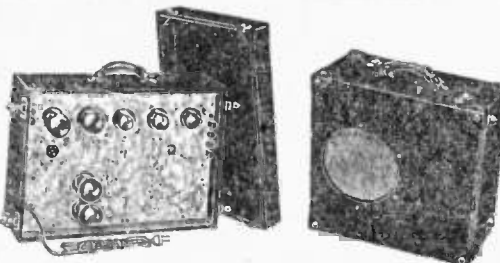
These units can be used with a suitable turntable and magnetic pick-up for the reproduction of records or recording use, can be used with radio tuning units, motion picture projector—either theatre or home type an., microphones. Shipping weight of Amplifier in carrying case, 80 lbs., of Double Speaker Unit in carrying case, 40 lbs.

List Price \$350.00

No. 1905 Mayo Portable Address System.

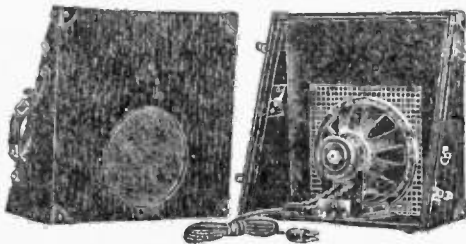
## YOUR PRICE

**\$183.75**



### Amplifier

Duo-Speaker Unit—Closed



### Duo-Speaker Unit—Opened

## Kolster 245 Power Amplifier

**YOUR PRICE — \$22.85**



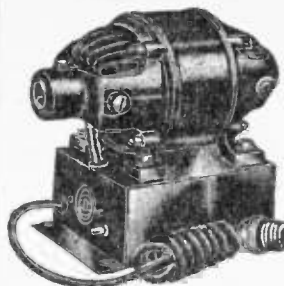
The famous Kolster two-stage power amplifier—complete with dynamic loud speaker accurately matched to the characteristics of the amplifier! Latest Model. Brand New. Finest Workmanship throughout. **THE MENDOUS POWER**, yet marvelous fidelity of tone. The perfect phonograph when used in combination with a high quality pickup device. **122, 2 1/2" and 1" 80 rectifier tube.** For 110 v. 40 waltz a.c. 500. Shipping weight, 45 lbs. Overall size of Amplifier, 16 1/2" x 9 1/2" x 13 1/2". Size of Speaker, 13 1/2" x 13 1/2" x 13 1/2".

List Price, \$98.00.

No. 1910 Kolster 245 Power  
Amplifier with Dynamic Speaker.  
YOUR PRICE \$22.85

## Janette Rotary Converters

### Changes D.C. to A.C.



have chosen, and without regard for price, that machine likely to prove most efficient in operation over a long period of time.

**THE JANETTE CONVERTER UNITS ARE SPECIALLY DESIGNED FOR RADIO OPERATION:** steel frame, double-wound armature, laminated steel polepieces, dynamic balance and perfect filtering. It is quiet and compact and may be kept in any room, the very corner of clothes closet or attic. Requires practically no attention. Ship complete with cord and outlet. Furnished in sizes of from 60 to 2500 watts output. Standard input voltages are 32, 115 and 230 volts D.C. Standard output current is 110 volts, 60 cycles A.C.

### MOST POPULAR TYPES

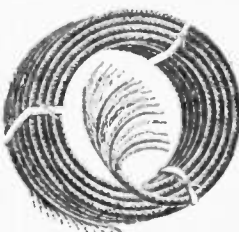
No.	32 Volts Output Watts	D.C. to Sh.p. Wt.	110 volts 60 1st Price	cycles A.C.	YOUR PRICE
3050	110	41 lbs.	\$19.50		<b>\$35.50</b>
3051	150	43 lbs.	58.00		<b>\$39.00</b>
3052	300	55 lbs.	80.00		<b>\$53.75</b>
	110-115 Volts	D.C. to 110 Volts	60 Cycles	A.C.	
3054	110	40 lbs.	\$19.50		<b>\$35.50</b>
3055	150	43 lbs.	58.00		<b>\$39.00</b>
3056	300	55 lbs.	80.00		<b>\$53.75</b>
3057	500	80 lbs.	100.00		<b>\$68.00</b>
	220-230 Volts	D.C. to 110 Volts	60 Cycles	A.C.	
3058	110	39 lbs.	\$51.50		<b>\$30.05</b>
3059	150	43 lbs.	60.00		<b>\$39.55</b>
3060	300	55 lbs.	80.00		<b>\$53.90</b>

Other sizes are available for special purposes at prices quite as interesting to the prospective buyer.

### Remote Control Cable

16 Wires—50 ft.

A cable of many uses! Ideal for remote control for radio receivers or for supplying voltages to condenser microphones in broadcast studios. May be used for supplying portable input amplifier in public address systems. This fifty foot cable has 16 wires, two of them shielded against interference. Fully color-coded and covered with high quality woven fabric. Shipping weight, 10 lbs.



No. 1674 Remote Control Cable  
YOUR PRICE

**\$2.00**

### Eby Twin Pin Jacks



An attractive and most useful item for coupling one or more speakers to receivers, amplifiers and other Radio and Electrical equipment. Are excellently suited for antenna ground connections, phonograph pickup input jacks, head phone outlets and many other useful purposes. Jacks are made of tempered metal contact springs. Insert into either black moulded all standard phone tips or into standard electrical contact. May be had with either "Phono" or "Speaker" embossed on them. Shipping weight, 4 oz.

List Price \$0.25

No. 1573 Eby Twin Pin Jacks "Phono"  
No. 1574 Eby Twin Pin Jacks "Speaker"  
**YOUR PRICE** 12 for \$0.95

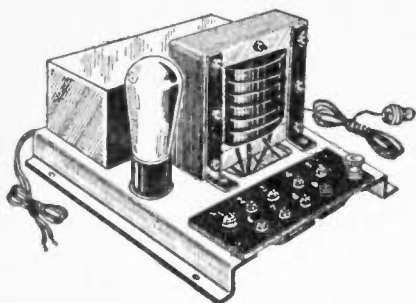
EA.  
**\$0.09**



# ELIMINATORS AND POWER PACKS

## Universal A-B-C Power Pack

For '71a, '45, '50 or '47 Pentode Power Tubes



This power pack may not be one of the best looking jobs, but it certainly is one of the most efficient ever built. Why pay for fancy gadgets when it is efficiency under load that counts? It is because of our decision to exclude all housings and use instead only ruggedly constructed components mounted on a sturdy base, that we are able to quote you the extremely low price we do.

### FIELD SUPPLY FOR DYNAMIC SPEAKERS

Each pack is complete with voltage divider, filter condensers, filter choke, by-pass condensers and convenient binding posts for all essential voltages. Two leads are provided to supply current to the field coil of dynamic reproducers which are employed as filter chokes. Where no dynamic speakers are employed the circuit is completed through a filter choke supplied with each instrument.

### CHOICE OF THREE PACKS

Many different types of tubes may be energized from either one of these three power packs; pentodes, variable "mu's", screen-grid, etc.

**TYPE A:** Filament supply for four type '26 tubes, one '27, two '71A's and an '80. Plate potential 180 volts; and the "C" voltage requisite for type '71A tubes.

**TYPE B:** Filament supply for four type '24 or '27 tubes, two '45's and an '80. Plate potential 180; and "C" for the '45's.

**TYPE C:** Filament supply for four type '21 or '27 tubes, two '47 pentodes, and an '80 rectifier. Plate potential, 250 volts; and "C" for the '47's. Specify which type is desired when ordering. Measures  $9\frac{1}{2} \times 6\frac{1}{2} \times 11$ ". Shipping weight, 14 lbs.

List Price \$18.50

No. 3081 Universal A-B-C Power Pack

**\$6.75**

Less tube



## BH Type Rectifier Tube

A gaseous rectifier tube for replacement in all Raytheon "B" Eliminators. 123 mills—Full wave. Shipping weight, 1 lb.

List Price \$3.50

No. 1652 BH Type Rectifier Tube

**\$1.12**

## Detecto-Light



A neon test lamp for testing fuses, ignition, polarity in D.C. circuits, etc. and for indicating A.C. and D.C. currents. With a little practice one can differentiate between sixty and 25 cycle A.C. with the use of this little pocket test lamp. 6" long. Well made. Shipping weight,  $\frac{1}{2}$  lb.

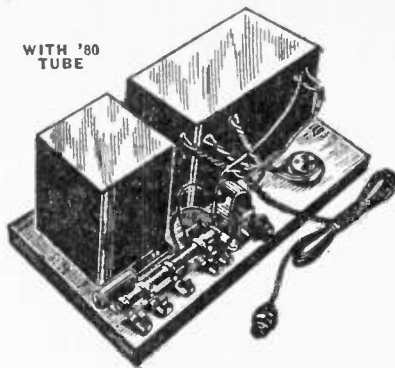
List Price \$2.00

No. 1611 Detecto-Light.

**\$0.88**

## "Trutest" B Eliminator

WITH '80 TUBE



A bone dry 180 volt B supply unit which furnishes smooth, steady plate current for radio receivers employing up to nine tubes. Has five voltage taps, namely, 22½ (variable), 45, 90, 135 and 180 volts and a current output of 60 milliamperes. A sturdy, dependable unit of excellent construction with all component parts readily accessible. Comes complete with cord, plug, and 280 rectifier tube ready to use. For 110-120 volts A.C. 60 cycles. Shipping weight, 30 lbs.

List Price \$14.75

No. 3075 "Trutest" B Eliminator With '80 Tube

**\$6.75**

YOUR PRICE

## Dumont Superior Built Bone Dry "A" and "B" Eliminator



An "A" and "B" eliminator housed in a single sturdy metal case for the complete electrification of battery type receivers. Has sufficient power output for receivers employing '71 tubes in push-pull. Provided with long power cord and on-off snap switch. The "A" supply unit consists of B-12 Benwood Linze Dry Rectifier. Low Resistance High

Grade Chokes. Efficient power transformer. Two 3,000 mfd. Condensers. Power Rheostat.

The "B" supply uses an '80 rectifier and high inductance choke coils and will supply 180 volts of "B". Shipping weight, 17 lbs. Overall size,  $6\frac{1}{2} \times 10\frac{1}{2}$ ".

List Price \$37.50

No. 1645 Dumont Superior Built Bone Dry "A" and "B" Eliminator

**\$14.00**

YOUR PRICE

## Dumont Superior Built "B" Eliminator



A sturdily constructed "B" eliminator employing ample filtration for the reduction of hum. Uses one '80 type tube for full wave rectification. Provides "B" power for receivers employing '71A tubes in push-pull. A "B" eliminator for the service

man at an unheard of price. Provided with long connecting cord and ON-OFF snap switch, but no rectifier tube which must be bought separately. Shipping weight, 9 lbs. Overall dimensions  $4\frac{1}{2} \times 10\frac{1}{2}$ ".

List Price \$25.00

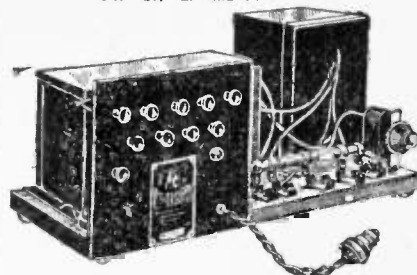
No. 1646 Dumont Superior Built "B" Eliminator

**\$7.50**

YOUR PRICE

## Complete A-B-C Power Pack

For '26, '27 and 71A Tubes



A complete A-B-C power supply for radio receivers using type 226, 227 and 71A tubes. It uses a type '80 rectifier and furnishes voltages of 22½, 45, 90, 135, 180 and 250 volts at a current drain of 85 m.a. Its A.C. filament voltages will take care of up to nine tubes of the 226, 227, 71A or 250, and 280 type.

### CONVERTS BATTERY SETS TO A.C. OPERATION

This power unit is just the thing for converting battery sets to complete A.C. operation. All that is necessary to effect the change are two bias resistors, two by-pass condensers, one 1Y socket and of course a set of A.C. tubes. This unit may also be used as a separate "B" eliminator.

Servicemen and experimenters can use this power pack to their advantage for testing and other purposes, as a reliable source of various voltages both A.C. and D.C. It lends itself readily to varied uses both experimental and practical.

Power pack is of excellent construction with shielded power transformer and condensers. All voltage taps are brought out to external binding posts. Shipping weight, 30 lbs.

List Price \$15.75

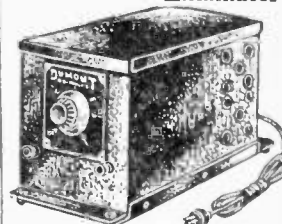
No. 3080 Complete A-B-C Power Pack

**\$8.75**

YOUR PRICE

less '80 rect.

## Dumont Superior Built Bone Dry "A" Eliminator



### NEW MODEL

An "A" eliminator for the complete electrification of battery type receivers. Uses special heavy duty Benwood Linze dry disc rectifiers, low resistance filter chokes, two 2,000 mfd. condensers and sturdy power rheostat. Has long connection cord with ON-OFF snap switch and is provided with an outlet for connecting the "B" eliminator.

For 50-60 cycle 110 volt A.C. circuits. No loose or moving parts. Sturdy and well built like a battleship. Good for years of dependable service. Well finished steel case. Shipping weight, 14 lbs. Overall size,  $4\frac{1}{2} \times 10\frac{1}{2}$ ".

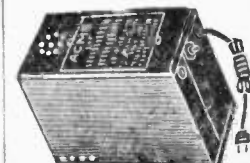
No. 1621 Dumont Superior Built Bone Dry "A" Eliminator.

**\$8.75**

YOUR PRICE

## Acme B & C Eliminator

IMPORTANT NOTE



The use of the ACME "B & C" ELIMINATOR in conjunction with the DUMONT "A" ELIMINATOR, provides for the complete electrification of all 6 volt type tube battery receivers. No new tubes need be purchased.

This unit delivers noise-free, permanent, unvarying "B" power, for any type of radio sets. It runs from any 110 volt, 60 cycle, A.C. light socket, replacing "A" and "C" batteries entirely. It delivers the required current for multi-tube receivers, and gives plenty of voltage to operate the power tubes in the last audio stages. Requires no adjustments of any sort.

Five output terminals are provided: C minus, C plus and B minus, B15, B30, B150, B200. Built throughout with the best materials money can buy, and each unit is triple-tested before shipping. Size is  $9\frac{1}{2}$  in. long, 5 in. wide,  $6\frac{1}{2}$  in. high. Rugged construction and built mechanically right. Designed to use a 280 type tube. Shipping weight, 20 lbs.

List Price \$35.00

No. 1620 Eliminator.

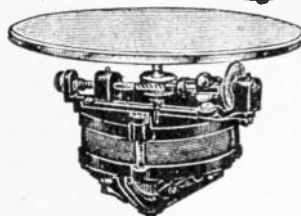
**\$7.50**

YOUR PRICE

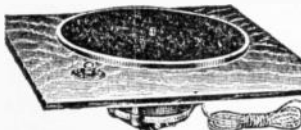


## Electric Motors With 12" Turntables Sonora Phonograph Motor

**Sonora**  
CLEAR AS A BELL



View without mounting board.



View with mounting board.

take any standard size record.  
By a special adjustment (at no extra cost) these motors will operate on D.C. current. Please specify when D.C. operation is wanted, otherwise A.C. motors will be supplied.  
An exceptional value, nothing like it. Shipping weight, 25 lbs. Overall size, 16x16x10 1/2".

No. 2010 Sonora Phonograph Motor.  
**YOUR PRICE**

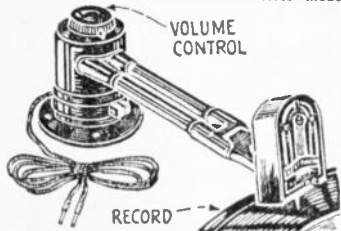
**NEW MODEL**  
Don't confuse with the Older and Cheaper Model.  
**FULLY ASSEMBLED and MOUNTED**

on 1/2 inch thick, w a r p - p r o o f, double veneer boards, size 15x15, ready to install into cabinet.  
These Motors are absolutely **NOISELESS** and **HUMLESS** of very rugged construction, operate on 110 volt A.C. current, 50-60 cycles, and are equipped with Speed Regulator and 6 foot cord and plug. The 12" turntable will

**\$7.75**

## Best B.B.L. De Luxe Home and Theatre Pick-Up NEW 1931 MODELS

Don't Confuse with Obsolete Models.



record wear is reduced to a minimum. Reproduction of phonograph music is brought to a new level of excellence by the use of these pick-ups. Just the thing for public address and auditorium installations. Built in volume control in base. Shipping weight, 7 lbs.

List Price \$20.00

No. 2300 Best B.B.L. De Luxe Pick-up (Home Model)

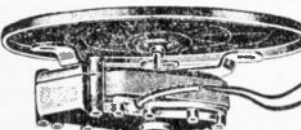
**YOUR PRICE**

List Price \$25.00

No. 2301 Best B.B.L. Pick-up (Theatre model with extra long tone arm)

**YOUR PRICE**

## Allen Hough A.C. Phonograph ROTOR SYNCHRONOUS MOTOR



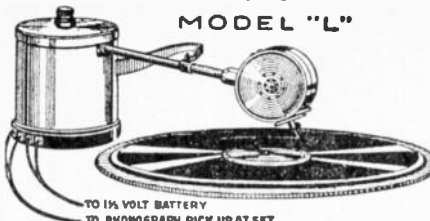
and stops at the mere touch of a finger. A MAJESTIC OF ELECTRICAL ENGINEERING. Regardless of voltage fluctuations, the turntable REVOLVES EXACTLY 80 TIMES IN ONE MINUTE, the prescribed standard for perfect reproduction, in the original pitch. Can fit into most any available space. Assures an even quality reproduction without distortion. Truly a perfect synchronous electric motor. For 110 volt, 60 cycle A.C. Shipping weight, 7 lbs. Complete with fine felt covered turntable. List Price, \$35.00.

No. 2000 A. H. Phonograph Motor.

**YOUR PRICE**

**\$3.35**

## Bristophone Phonograph Pick-Up MODEL "L"



It is a product of the famous Bristol Company. The illustration shows Model "L" with an automatic cut-off. Current is automatically turned on when tone arm is removed from its rest.

The Bristophone is a new instrument built on the same principles as a Microphone and can also be used for Indoor Broadcasting.

Bristophone has much greater volume than any ordinary Pick-up and operates with a 1 1/2-volt Dry Cell Battery when used in connection with the Amplifier of an Electric Set.

Operates on A.C. or D.C. Electric or on Battery Sets. Shipping weight, 8 lbs.  
Model "L" (automatic) List Price \$45.00  
No. 2303 Bristophone Pick-Up  
**YOUR PRICE**

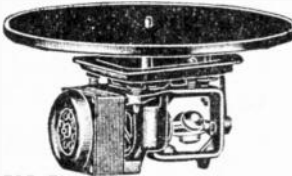
**\$4.50**

## Green Flyer Electric Motor

A. C. Induction Type

25-60 Cycles

NOT SURPLUS STOCK



FOR THE HEAVIEST ELECTRIC PICK UPS on all records.

These motors are not surplus merchandise but come directly from the factory. Do not confuse with the old type low-priced Green Flyer Motors dumped on the market as job lots. These motors are guaranteed by the manufacturers and by us to be free of all electrical and mechanical defects.

### LIFE LONG CONSTRUCTION FEATURES

Presents ABSOLUTE UNIFORMITY OF SPEED under extreme voltage and frequency variations. Will not overheat in closed cases or cabinets. Has silent, spiral-cut fibrous and long, over-size SELF-LUBRICATING BEARINGS. Furnished complete with 10" velocity turntable, dial and speed regulator pointer and nickel plated or oxidized hardware. Equipped with metal mounting plate ready to install. Available for both 25 and 60 cycles 110 volts A.C. Specify which when ordering. Shipping weight, 15 lbs.

List Price \$15.00

No. 1012 Green Flyer Induction Motor for 60 Cycles A.C.

**YOUR PRICE**

**\$9.25**

No. 1013 Green Flyer Induction Motor for 25 Cycles A.C.

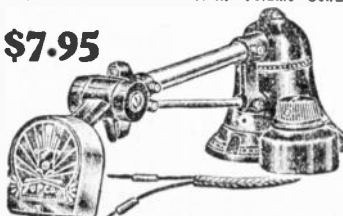
**YOUR PRICE**

**\$10.20**

## New "UPCO" Professional Pick-Up

Chromatic Unit with Built-In Volume Control

**\$7.95**



Used extensively in theatres, public address systems and portable amplifier units and wherever else faithful reproduction of phonograph music is called for.

UPCO'S engineers, backed by limitless skill and experience, have evolved this truly scientific, sensitive instrument, capable of reproducing all of the world's finest music with full justice to the consummate art of its creators. A good value at full list price of \$11.50. Shipping weight, 5 lbs.

List Price \$11.50

No. 2305 UPCO Professional Pick-Up  
**YOUR PRICE**

**\$7.95**

## NEW! NEW!

## Utah Magnetic Phonograph Pick-Up With Self-Contained Volume Control



The Utah electro-magnetic pick-ups presented here comply with all the rigid requirements for faithful electrical reproduction of phonograph records. They are of recognized merit for use in converting old phonographs into the latest electrical reproducing types. Have frequency response characteristic essentially flat from 60 to 8,000 cycles. Incorporate fine steel magnets of exceedingly high flux density thereby insuring a maximum amount of induced current under normal pressure on record. They are extremely sensitive, faithfully reproducing every delicate tone shading. The weight of the tone arm is carefully calculated, making the stylus bearing gentle and requiring no balancing. The construction reduces wear on records to a minimum. Hinged head makes record changing easy. All bearings free from play and chatter. Standard impedance 7500 ohms at 1000 cycles. Supplied with six-foot cord with phone tips. Artistic statuary brown finish. Individually boxed. Weight 2 1/2 lbs.

No. 2310 Model D Utah Pick-Up with Self Contained Volume Control

**YOUR PRICE**

**\$8.45**

No. 2311 Model C Utah Pick-Up less Volume Control

**YOUR PRICE**

**\$6.75**

No. 2312 Model D 201 Utah Pick-Up with No. 201 Adapter for D.C. Sets

**YOUR PRICE**

**\$9.10**

No. 2313 Model D 227 Utah Pick-Up with No. 227 Adapter for A.C. Sets

**YOUR PRICE**

**\$9.10**

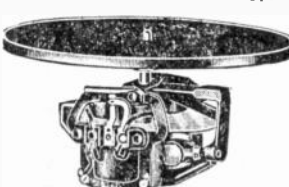
No. 2314 Model A 1 Ut h Pick-Up Head only, with cord and bracket to clamp on any tone arm.

**YOUR PRICE**

**\$5.40**

## General Electric Phono Motor

Induction Type



double phase, compound wound induction coils and disc type balanced armature assuring quiet and smooth operation. Speed control is achieved through a simple friction disc-lever arrangement. Lasts a life time—nothing to wear or burn out. Sold complete with a 12" turntable. For 110 volts A.C. Shipping wt., 12 lbs.

List Price \$12.50

No. 2011 General Electric Phono Motor

**YOUR PRICE**

**\$7.80**

## Blue Devil Speaker Unit

An excellent unit for use in the construction of cone, wood or cloth speakers. Is standard unit in Sonora and Freshman magnetic speakers. Tungsten steel magnet drive. Will stand 600 volts. Shipping weight, 3 lbs.

List Price \$6.50

No. 1550 Blue Devil Speaker Unit.

**YOUR PRICE**

**\$0.98**

## "Duo" Loudspeaker Unit

This is a balanced type unit for use in the construction of "cone", aeroplane linen or Balsawood loud speakers. Its general excellence with regard to fidelity and sturdiness recommends it to those enthusiasts who build their own speakers. Shipping weight, 4 lbs.

List Price \$10.00

No. 1551 "Duo" Speaker Unit

**YOUR PRICE**

**\$3.20**

# Miles Quality Microphones

## Portable Microphone and Pre-Amplifier



This compact, highly efficient unit consists of a single button carbon microphone of the mid-get type, described elsewhere on this page, microphone input transformer, potentiometer, battery compartment, "on-off" toggle switch and 25 feet of two-conductor connecting cable — all these compactly installed in a unit at cabinet attractive finish. JUST THE UNIT FOR PUBLIC ADDRESS, PAGING AND HOME RECORDING SYSTEMS. Will match the input impedance of all type amplifiers and radio receivers. Easy to use with the latter by connecting the two leads across the grid and cathode of the detector irrespective of type of tube used. Full instructions accompany each unit. Shipping wt., 4 lbs.

List Price \$20.00  
No. M308 Portable Microphone and Pre-Amplifier Unit.  
**YOUR PRICE \$12.45**

## Miles Two-Button Microphone

Carbon Type M 301

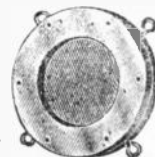


Diameter 3 1/4 in. x 1 1/4 in. thick. Resistance 100 ohms per button. (perfectly balanced and matched) and operates on 3 to 6 volts at 8-10 mils per button. SPECIAL ALLOY STRETCHED DIAPHRAGM. Unique assembly and high quality of materials used enable this microphone to REPRODUCE FAITHFULLY ALL FREQUENCIES BETWEEN 50 AND 5000 CYCLES. All traces of "hiss" are completely eliminated on this unusually efficient and sensitive microphone. Attractively finished. Shipping weight, 4 lbs. List Price \$25.00

No. 1658 Miles Two-Button Carbon Microphone.  
**YOUR PRICE \$14.70**

## Miles Single Button Microphone

Type M 300



3 3/4 in. diameter by 1 1/4 in. thick. Resistance 100 ohms. Requires from 3 to 6 volts at 8-10 mils per button. Special alloy gold-plated diaphragm and unique construction of this microphone are responsible for its fully pleasing and natural reproducing PERFORMANCE. FROM 50 TO 3500 CYCLES, with excellent volume. Can be mounted in any type stand. Heavy steel frame is CHROMIUM-PLATED to prevent tarnishing and corrosion. Will keep its bright lustre for many years. Ship weight, 2 lbs.

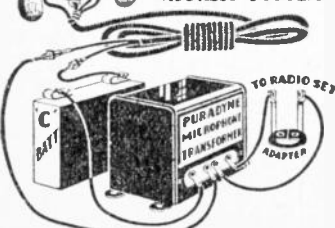
List Price \$15.00  
No. 1659 Miles Single Button Microphone Type M 300  
**YOUR PRICE \$8.80**

## Home and Auditorium Address System

MAGNAVOX MICROPHONE



**HOME and AUDITORIUM ADDRESS SYSTEM**



With this equipment you can now make a public address system out of any radio set, battery or electric. Between the regular radio program you can cut in and make your own special announcements. Excellent also for home recording.

Simple to install. Plug the adapter in the detector socket and replace tube. Comes complete with microphone, adapter, microphone battery and microphone transformer. Shipping weight, 5 lbs.  
No. 1660 Address System  
**YOUR PRICE \$5.45**

## A REAL Microphone



A genuine Miles microphone which has been ingeniously engineered to absolutely the smallest possible proportions commensurate with modern standards of microphone efficiency. Has a D.C. resistance of 100 ohm and responds indifferently to all frequencies between 25 and 2500 cycles. A really remarkable range for a microphone of this type. Ideal for home recording and private intercommunication systems. Can be placed in any inconspicuous or invisible spot—at which point it will most efficiently pick up any conversation going on in certain rooms or departments under surveillance—in general it will pick up speech from a distance of 25 to 75 feet, depending upon the acoustics of the room. Requires from 3 to 6 volts to energize it. Full instructions accompany each unit. Shipping weight 1 lb.

List Price \$7.50  
No. M306 Miles Midget Microphone.  
**YOUR PRICE \$3.25**

## Adjustable Floor Stands



Properly balanced floor stands of conventional size for suspension-type microphones. The top ring is 6 1/4" inside diameter, base 8 1/4". Smooth in operation. Extends to about 5 1/2 ft. by means of a positive, easily-operated clamp lock. Hundreds of these stands are in use in all parts of the world. Constructed of durable metal and beautifully finished in either lacquered brown or gold color.

All stems are bored to permit free passage of the microphone wires which reappear through an insulated aperture in the base of the stand. Available in either the universal or modernistic designs. Shipping weight, 18 lbs.

List Price \$15.00  
No. 2353 Universal Floor Stand  
**YOUR PRICE \$6.00**

List Price \$20.00  
No. 2354 Modernistic Floor Stand  
**YOUR PRICE \$7.50**

## Banquet Microphone Stands



Half-height stands for use on tables, at banquet, desk, pulpit, etc. Specially suitable for amateur and studio announcer's use. Top ring 6 1/4" inside diameter furnished with four eyes for suspension springs.

Available in two models, rigid and a justable. The rigid type measures 19 1/2" high and is 8 1/2" wide at the base. Adjustable stand measures 23 1/2" minimum and 35 1/2" maximum height. Base is 8 1/2" wide. May be had in either brown or gold lacquered finish.

The top ring alone with the four spring eyes and suspension hook can be readily furnished.



Style	Shpg. Wt.	List Price	YOUR PRICE
2350 Fixed Banquet	5 1/2 lbs.	\$8.50	\$2.75
2351 Adjustable Banquet	6 lbs.	10.00	\$4.00
2352 Top Ring only	3 lbs.	4.00	\$1.75

## Skinderviken Microphone Button

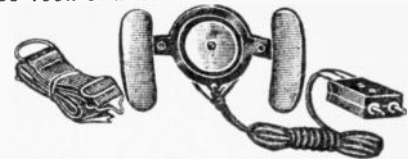


Smallest microphone made, measuring only 3/4 in. in diameter.

By means of this microphone button a great many experiments can be made. It can be used as a detector (diatphone) to listen in secretly on conversations, etc., and to amplify phonograph music at a distance. Very good sensitivity. Do your own home recording with this fine mike. We furnish directions to make some twenty-five different experiments.

List Price, \$1.25.  
No. 1634 Mike Button.  
**YOUR PRICE \$0.65**

## Genuine Magnavox Microphone DO YOUR OWN HOME PHONOGRAPH RECORDING



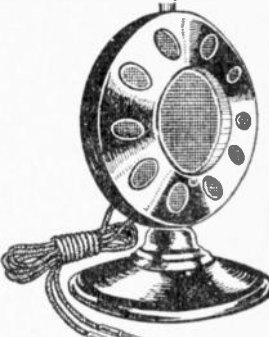
One of the finest microphones made. Made by the world-famous Magnavox Co. While originally made to strap on the head, it is an easy matter to screw a handle onto one of the side brackets. (The other bracket can then be removed if desired.) The side metal brackets are covered with soft rubber and have the function to place the microphone at the best speaking distance from the mouth. (The brackets press lightly against cheeks.) If you wish to preserve the brackets and yet make a hand-mike, you can construct a handle from bakelite or hard rubber by screwing it on the two brackets.

Microphone comes with 6 feet of cord and plug as shown.

The biggest mike bargain in America! Complete with straps and buckle, to fit around head, as illustrated. For use with public address systems or for novelty purposes, i.e., speaking "into" your audio-amplifier, for its reproduction in your loud speaker! Entertaining and instructive! Brand new in original factory packing. Shipping weight, 1 lb. List Price, \$10.75.

No. 1610 Magnavox M'ke.  
**YOUR SPECIAL PRICE \$1.45**

## FAMOUS "UNIVERSAL" MIKES Universal Baby Mike—(New Type)



Baby Mike is a real microphone, single button with high sensitivity. Comes with 3 foot cord. The case is 3 inches high. The button is gold plated and the response of far better quality than would be expected for the low price. An ideal instrument for home recording and broadcasting. Instruction sheet is included. Shipping weight, 1 lb. List Price, \$5.00.

No. 1653 Baby Mike  
**YOUR PRICE \$3.00**

## Amplion Transverse Current Mike Contains No Metal Diaphragm, Carbon Button or Moving Parts



This new Microphone is known as a Transverse Current Microphone, so-called because an electric current passes transversely across the Microphone and parallel to a silken diaphragm. The silken diaphragm forms the front wall of a receptacle filled with carbon granules. The transverse current is modulated by the variations in pressure against the carbon granules caused by the vibrations of the diaphragm in harmony with sound impulses.

## COMPLETELY ELIMINATES CARBON HISS

In the conventional, or "carbon button" microphone, the electrodes vibrate with a metal diaphragm. This vibration causes the granules to "clap or scrape" against the surface of the electrodes, causing the objectionable carbon hiss characteristic of "carbon button" microphones. If the electrodes are made sufficiently light to vibrate over a fragile area is too small to permit a equate contact with the granules, resulting in heat losses, high resistance, low efficiency and carbon noise.

Excellent for studio and home recording, commercial and amateur broadcasting and public address work. Has a resistance of 500 ohm. Measures 2 1/2" x 3 1/4" at its greatest width. Shipping weight, 2 lbs.

List Price \$15.00  
No. 2360 Amplion Transverse Current Hand Microphone  
**YOUR PRICE \$5.00**

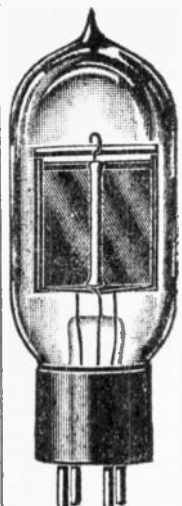


# Guaranteed Radio Tubes

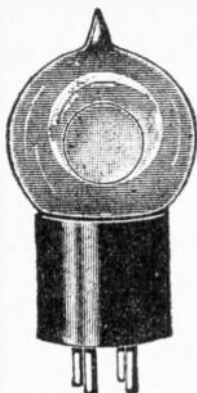
ALL TUBES GUARANTEED FOR 6 MONTHS

For the first time, a standard brand of radio tubes is sold at extraordinarily low prices, yet each and every one of the tubes are guaranteed in all respects for 6 months. Any tube that fails to make good for ANY reason will be replaced free of charge within 6 months, as long as the filament still lights.

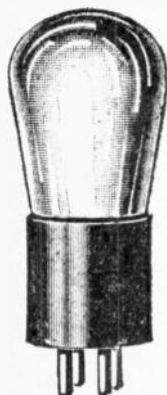
We Present on this page the largest assortment of Radio tubes ever published in any Catalog — 47 different types. Many tubes for special purposes will be found here that you cannot get elsewhere.



Telion Television Tube \$3.90



2-Inch Photo-Electric Cell, \$3.90



Switch Tube \$0.85  
Switch is used when one filament burns out, tube therefore has twice normal life. With switch on acts as 171 or 112 Power Tube — with switch off it is 201A Tube.



5-Prong 201A \$0.85

NEONTRON tubes are manufactured by one of the oldest, reliable Eastern tube manufacturers and we have made special arrangements for this unparalleled sale.

You will find here tubes that you cannot buy elsewhere, yet the price is low when you figure the long service that these tubes will give you. There are no better tubes made than NEONTRON, regardless of price.

If you wish a tube replaced, it is necessary to return it to us and we will send you a new one immediately.

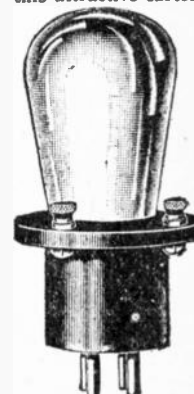
No replacements after six months.



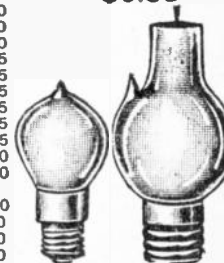
High Grade (Hi Mu) 201A Type — better vacuum—works and fits in any set. \$0.85



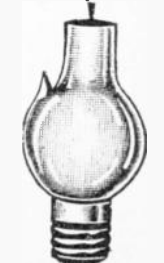
All tubes come in this attractive carton.



A.C. Adapter Tubes to convert battery sets into A.C. Electric sets—furnished for 226, 227, 171A. \$0.85



2-Amp. Charger Bulbs. \$2.15



5 & 6 Amp. Charger Bulbs. \$4.85

## RCA Licensed

TYPE	PRICE
UX-201A—Amplifier or Detector—Standard for all purposes.....	No. 600 \$ .50
UX-226 —Used as amplifier tube for A.C. operation.....	No. 601 .60
UY-227 —Used as detector amplifier for A.C. operation.....	No. 602 .60
UY-227A—Quick Heater—Detector and Amplifier for A.C. operation.....	No. 614 .60
UX-171A—Power output amplifier for A.C. or D.C. operation, 1/4 amp.....	No. 603 .65
UX-171 —Same characteristics as the 171A on tungsten filament, 1/2 amp.....	No. 604 .70
UX-240 —Designed for impedance and resistance coupling.....	No. 605 .70
UX-120 —Power amplifier used in last stage of audio frequency of battery set using dry cells.....	No. 606 .70
UX-199 —Detector and amplifier tube, long prongs.....	No. 607 .70
UV-199 —Same characteristics as UX-199 only short prongs.....	No. 638 .70
UX-112 —Power amplifier tube, 1/2 amp.....	No. 609 .70
UX-112A—Power amplifier tube for low current consumption, 1/4 amp.....	No. 610 .73
UX-200A—Detector tube recommended for weak signals and good reception.....	No. 611 .70
UY-224 —Screen grid, four-element, used as frequency amplifier and linear power detector in special circuits.....	No. 612 .60
UY-224A—Quick Heater—Used same as above.....	No. 618 .60
UX-245 —Power amplifier tube used in last audio stages—for low plate voltage.....	No. 613 .80
200A—Special detector tube, a supersensitive detector.....	No. 615 .85
201A—Special radio frequency, a supersensitive detector.....	No. 616 .85
201A—Special audio frequency, a supersensitive detector.....	No. 617 .85
T-14 (201A High Mu), high emission.....	No. 619 .85
Switch tube, 201A and 112 or 171, double life.....	No. 620 .85
226, 227, 171A—Adapter tubes, to convert battery sets into A.C., each.....	No. 611 .85
UX-230—Detector—Amplifier for use with dry cells or storage battery.....	No. 635 1.10
UX-231—Power Amplifier—for dry cells or storage battery.....	No. 636 1.10
UX-232—Screen grid radio frequency amplifier for dry cells or storage battery.....	No. 637 1.10
UY-235—Variable Mu Screen Grid R.F. Amplifier.....	No. 642 1.10
UY-236—Special Auto Screen Grid R.F. Amplifier.....	No. 643 1.10
UY-237—Special Auto Detector or Amplifier.....	No. 644 1.10
UY-238—Special Auto Pentode Power Amplifier.....	No. 646 1.10
UY-247—Super-Power Pentode Amplifier.....	No. 647 1.10
UY-551—Variable Mu R.F. Amplifier.....	No. 648 1.10
UX-886—Half-Wave Mercury Vapor Rectifier Plate Current 600 mills.....	No. 649 5.00
UX-210—For power amplifier, high voltage.....	No. 622 1.60
UX-250—Power amplifier in last stage of audio frequency.....	No. 623 1.60
201A—All bakelite shield tube.....	No. 624 1.60
UX-222—Screen grid tube for D.C. operation. Radio frequency amplifier.....	No. 625 1.60
Telion television tube.....	No. 626 3.90
Photo-electric cell—2 inches.....	No. 627 3.90

### RECTIFIER AND CHARGER BULBS

125 mil. rectifying tube (B. H. type).....	No. 628 1.70
2 amp. old and new charger bulbs (list \$4.00), our price.....	No. 629 2.15
5 and 6 amp. old type charger bulbs (list \$8.00), our price.....	No. 630 4.85
UX-280—Used as fullwave rectifier tube for high emission.....	No. 631 .75
UX-281—Characteristics similar to the 280, but used as half-wave rectifier of high emission.....	No. 632 1.60
Freshman rectifying tube, especially designed for use with Freshman Master "B" Eliminators, UV brass base, limited quantity.....	No. 633 .60

Order by Our Catalog Number Preceding Price

RADIO TRADING COMPANY, 25 WEST BROADWAY, NEW YORK, N. Y.

# NATIONALLY ADVERTISED TUBES



THE tubes listed here are all standard brands, and well-known. They are all nationally advertised, and of course, are **FIRST QUALITY ONLY**. We have been enjoying a tremendous tube business because hundreds of satisfied customers know that our guarantee means something. They know from experience that we have a way carried out our replacement guarantee to the letter, and there has been no quibbling about it. The Radio Trading Co. policy is, "The customer is always right—even if he is not!" We defy anyone to prove that any customer ever returned a radio tube and did not receive 100% satisfaction.

In offering these nationally known brands of tubes, we wish our customers to understand that we stand back of them, and that we pass on to you the unconditional manufacturers' guarantee on replacements.

**THESE TUBES ARE FULLY GUARANTEED IN EVERY RESPECT**

They are all brand new—first quality only. Neither of the two brands listed here produce seconds or inferior tubes. All tubes are meter tested and are warranted to be perfect in every respect.

**UNCONDITIONAL GUARANTEE**  
PERRYMAN and TRIAD tubes are all guaranteed unconditionally for six months. All are sold in original packages, and all tubes that do not perform will be replaced.



**60% DISCOUNT OFF LIST PRICES**

This tube is too well known to acquire a lengthy description of its merits. Whatever your tube requirements, you can meet them with Triad, the tubes that will always show up best on any meter test. It is an honor-built tube, and, of course, licensed by R.C.A. Triad tubes are perfect in performance, for particular people who like a particular product; a tube that will please you for a long time to come. Customers who have used Triad tubes always come back for more.



Perryman tubes are widely advertised throughout the country. It is a laboratory tube that radio technicians have been using for years. **WE KNOW OF NO TUBE WITHOUT EXCEPTING ANY,** that can touch the Perryman tube for performance, and we are willing to prove this statement to you. A trial will convince you.

We are fortunate in offering this first-rate tube at an average discount of

**50%—60% DISCOUNT FROM LIST PRICE**



Cat. No.	Type	Description	List Price	YOUR PRICE
675	UY227	2.5 Volts, 1.75 Amp.	\$2.20	\$0.60
676	UX226	1.5 " 1.05 "	\$1.75	\$0.60
677	UX171	5 " 0.50 "	\$2.25	\$0.90
678	UX171A	5 " 0.25 "	\$2.25	\$0.75
679	UX280	5 " 2.00 "	\$1.90	\$0.75
680	UX222	3.3 " 0.132 "	\$4.50	\$1.80
681	UX201A	5 " .25 "	\$1.25	\$0.50
682	UX245	3.5 " 1.5 "	\$2.00	\$0.75
683	UY224	2.5 " 1.75 "	\$3.30	\$1.00
684	UX112A	5 " .25 "	\$2.25	\$0.75
685	UX281	7.5 " 1.25 "	\$7.25	\$2.40
686	UX250	7.5 " 1.25 "	\$11.00	\$3.00
687	UX210	7.5 " 1.25 "	\$9.00	\$3.25
688	UX159	3 " .06 "	\$2.50	\$1.00
689	UV199	3 " .06 "	\$2.50	\$1.00
690	UX230	2 " .06 "	\$2.20	\$0.80
691	UX231	2 " .13 "	\$2.20	\$0.80
692	UX232	2 " .06 "	\$3.30	\$1.20
693	UY236	Screen Grid Amplifier	\$2.75	\$1.10
694	UY237	Auto Detector and Amplifier	\$1.75	\$0.72
695	UY238	Auto Power Pentode	\$2.75	\$1.10
696	UY233	D. C. Power Pentode	\$2.75	\$1.10
698	UY247	A. C. Power Pentode	\$1.90	\$0.77

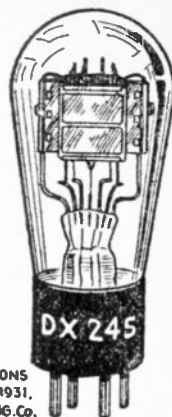
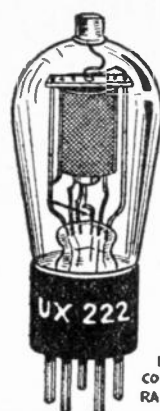
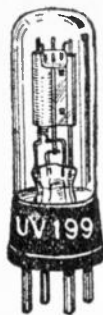
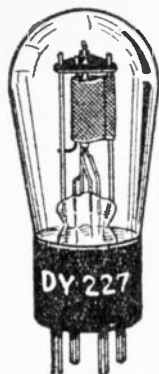
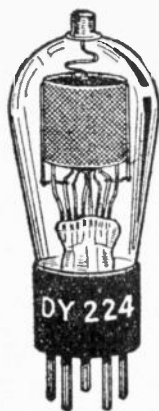
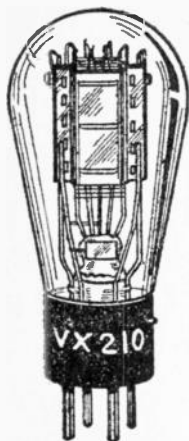
ORDER BY OUR CATALOG NUMBER

Cat. No.	Type	Description	List Price	YOUR PRICE
670	UV199	Detector and Amplifier	\$2.75	\$1.10
671	UX199	Detector and Amplifier	\$2.50	\$1.10
672	UX220A	Detector	\$4.00	\$2.80
673	UX201A	Detector and Amplifier	\$1.25	\$0.50
674	UX222	D. C. Screen Grid	\$4.50	\$1.99
675	UX226	Amplifier	\$1.75	\$0.70
676	UY227	Detector and Amplifier	\$2.20	\$0.49
677	UY224	A. C. Screen Grid	\$3.30	\$0.79
678	UX120	Power Amplifier	\$3.00	\$1.40
679	UX112A	Detector and Amplifier	\$2.25	\$0.65
680	UX171A	Power Amplifier	\$2.25	\$0.45
681	UX250	Power Amplifier	\$11.00	\$2.64
682	UX245	Power Amplifier	\$2.00	\$0.55
683	UX240	Detector and 1st Audio Resistance-Coupled	\$3.00	\$1.40
684	UX280	Full-Wave Rectifier	\$1.90	\$0.49
685	UX281	Half-Wave Rectifier	\$7.25	\$2.20
686	UX230	Detector and Amplifier	\$2.20	\$0.70
687	UX231	Power Amplifier	\$2.20	\$0.70
688	UY232	Screen Grid		
689	UY233	Detector and Amplifier	\$3.30	\$1.02
690	UY236	Power Amplifier Pentode	\$2.75	\$1.20
691	UY237	Screen Grid Amplifier	\$2.75	\$1.20
692	UY238	Detector and Amplifier	\$1.75	\$0.77
693	UY239	Power Amplifier Pentode	\$2.75	\$1.20
694	UY247	Power Pentode	\$1.90	\$0.77

ORDER BY OUR CATALOG NUMBER



# PERFECT RADIO TUBES



ILLUSTRATIONS  
COPYRIGHT - 1931,  
RADIO TRADING CO.

## LOW PRICED TUBES. FACTS YOU SHOULD KNOW ABOUT "TUBE SECONDS"

To meet competition we list these tubes. For some time the market has been flooded with low priced tubes; the so-called "35c" tube. The intelligent radio man should know the true facts about such tubes, and govern himself accordingly.

Every reputable radio tube manufacturer, with few exceptions, rejects in the course of manufacture, a vast amount of tubes that have slight imperfections. These tubes may be 80% or 90% perfect, but they are not sufficiently perfect to pass all the different rigid meter tests, and for that reason, they are discarded and sold in the market as SECONDS. In practically all cases, such tubes are not theationally known and advertised tubes, but are marketed under various private brand names, which name do not mean a good darned thing. Sometimes these "brand" names are highly euphonious and high sounding, but you will not see these brands advertised in a reputable radio magazine, nor for that matter, in any magazine.

Of course, these tubes are not junk, and they really do give surprising service in the majority of cases, but no first class radio tube manufacturer would wish to palm them off to the trade as a first grade tube. Hence, these

### Gen-Win Tone Control



This tone control is scientifically designed for regulation and control of tonal quality. The proportion of treble and bass frequencies given off by the loud speaker may be regulated at will.

Most new receivers embody tone control. It is the new feature of radio. Without the use of tools, you can easily bring any electric or battery operated receiver up-to-date. Complete instructions for installing and operating packed with each set. Shipping weight, 1 lb.

List Price \$3.75

No. 1638 Gen-Win Tone Control  
YOUR PRICE

**\$2.05**

Above tone control for panel mounting, list price \$2.75

No. 1639 Panel Tone Control  
YOUR PRICE

**\$1.50**

It is not surprising as it may seem, we meter test every tube before we ship it, because after all we don't want them back. EVERY TUBE RETURNED KILLS THE PROFIT OF THREE, in handling expenses.

Cat. No.	Type	Volt	Amp.	Your Price
750	201-A	5	.25	\$ .40
751	226	1.5	1.05	.32
752	280	5	2.0	.35
753	222	3.3	.132	1.40
754	X-109	3	.06	.60
755	V-159	3	.06	.60
756	250	7.5	1.25	1.40
757	227	2.5	1.75	.35
758	112-A	5	.25	.35
759	171-A	5	.25	.35
760	224	2.5	1.75	.35
761	210	7.5	1.25	1.40
762	X-120	3.3	.132	.55
763	281	7.5	1.25	1.40
764	245	2.5	1.5	.35
765	WD11 WD12	1.1	.25	1.00
766	200	2	.06	.64
767	221	2	.13	.80
768	232	2	.06	.92
769	217	2.5	1.75	.50
770	235	2.5	1.75	.50
771	551	2.5	1.75	.50
772	236	6.3	0.3	.75
773	237	6.3	0.3	.75
774	238	6.3	0.3	.75

ORDER BY OUR CATALOG  
NUMBER

### Television Receiving Tubes



Recent television developments in the laboratory of a well known company have opened this field for experimentation to advanced radio enthusiasts. ARGCO Television Receiving Tubes have been manufactured expressly for the purpose of facilitating the demonstrations of experimenters and laboratory experts.

ARGCO Television Receiving Tubes have been designed to avoid high snare charges, and at the same time, confine the light to the most useful portion of the cathode. Brilliant light spots usually found on the cathode and caused by high frequency current vibrations have been entirely eliminated in ARGCO Tubes by a special process which minimizes "sputtering" under the influence of the discharge. Rigid support of the elements is obtained by the use of sturdy glass rods.

This tube is of small construction, 1 1/4 in. x 3 1/4 in. with cathode 1 in. square. Shipping weight, 1/2 lb.

List Price \$4.00

No. 775 Television Lamp.  
YOUR PRICE

**\$2.00**

## WHY GOOD TUBES CAN BE SOLD AT THESE PRICES

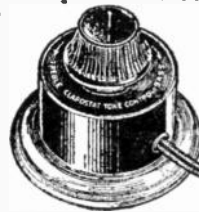
Orphans of the waves are put into nice boxes and sold under various brand names. Such tubes are never accompanied by any sort of a guarantee that means anything, but are usually marketed under a "live-day guarantee," which means that if the tube blows out after five days you are stuck with it, and have no redress. This, of course, is the extreme case, because as stated before, some of these tubes do manage frequently to give a surprising performance. As a matter of fact, they do not burn out quicker than a first grade tube, but when it does happen, you have no redress. This is quite properly so, because after all, when you pay for tubes at a discount of 30% or more off the list prices, you cannot expect more.

Remember, THESE TUBES ARE NOT SECOND HAND. They have not been used before. They are all new tubes and at the prices they are sold you really do not take a fearful chance.

We have been brutally frank with you, and have told you the situation as it is. We pass on the usual guarantee to you on these tubes, that is,

USE THE TUBES FOR FIVE DAYS, AND IF THEY ARE NOT FULLY SATISFACTORY WE WILL STILL MAKE GOOD. After five days our guarantee ceases.

### Clarostat Tone Control (Portable Type)



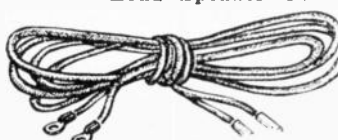
Tone control is the latest feature of radio design. The Clarostat tone control unit is a universal device operating with all types of receivers without any alterations. Merely slip the wafer adapters supplied with control under the tubes. A simple turn of the knob gives complete tonal variation from bass to treble. Complete with connecting cord and adapters ready for use. No technical knowledge is necessary for installation. Shipping weight, 1/2 lb.

List Price \$2.35

No. 2231 Clarostat Portable Tone Control  
YOUR PRICE

**\$1.35**

### Loud Speaker Cord



A fabric covered double conductor cord equipped with attachment plugs and pins. Obtainable in six foot lengths. Coded for polarity. Shipping weight 4 lb.

No. 1671 Loud Speaker Cord.  
YOUR PRICE

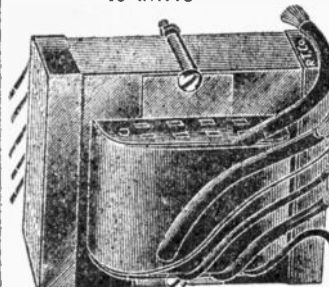
**\$0.10**

RADIO TRADING COMPANY, 25 WEST BROADWAY, NEW YORK, N. Y.

31

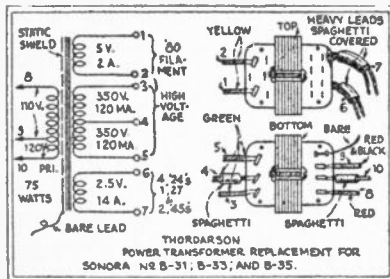
## Thordarson "245" "Sonora" Replacement A.C. Power Transformer

75 WATTS



Many engineers believe that in time power transformers will be designed to deliver on a filament potential and one high plate potential; but until there is available a rectifier with a filament operative on 2.5 volts, this construction will not be looked. The nearest approach to this simplicity of construction and use is exemplified in the "Sonora" replacement unit for Models B-31, B-33, and B-35. It includes a 5-volt rectifier filament winding, a high-voltage center-tapped secondary, and then a heavy-output filament winding which is designed to deliver at least 14 amps. at 2.5 volts may be loaded to 15 or 16 amps., without undue heating. This secondary thus will accommodate a number of 2.5-volt tubes—the '27's, '21's, '45's—and even, with a regulating resistor, a type '26; while the new dry-cell tubes may be accommodated, and in nearly any quantity. The latter suggestion is only for the technician experienced in circuit design and arrangement; as otherwise the hum, due to the low heating inertia of the filament, may not easily be balanced out. A modern, well-designed transformer. Rating, 75 watts.

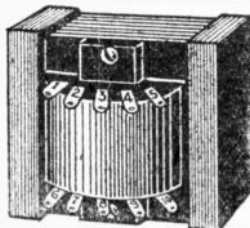
For 110-120 Volt, 50-60 Cycles.  
Dimensions, 3 1/2 x 4 1/2 x 3 1/2 in. high. Shipping weight, 7 1/2 lbs.



List Price, \$12.00  
No. 1413 Thordarson Transformer.  
YOUR PRICE **\$3.45**

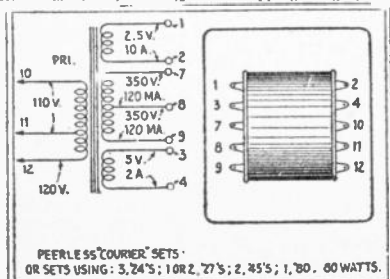
## Peerless ABC Power Transformer

80 WATTS  
25-60 Cycles



As used in "Courier Model 65" chassis. Plate, control-grid, screen-grid, filament voltages for three '24's, two '27's, two '45's, an '80 rectifier. This 80-watt transformer has approximated by the following output ratings: 2.5 V., 10 A.; 700 V., center-tapped, 350 V. and 120 MA. on each side; 5 V., 2 A.; Primary

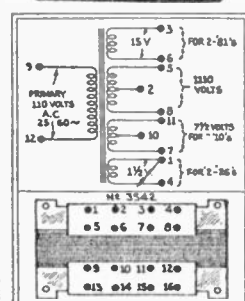
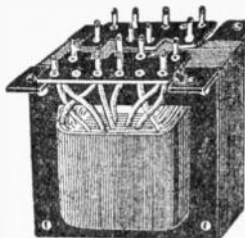
tapped for low or high line voltage. The correct replacement for big sets. For 110-120 volts, 25 or 60 cycles. Dimensions, 4 x 3 1/2 in. Shipping weight, 6 lbs.



List Price, \$12.00  
No. 1403 Peerless ABC Transformer.  
YOUR PRICE **\$2.75**

## Kolster Power Transformer

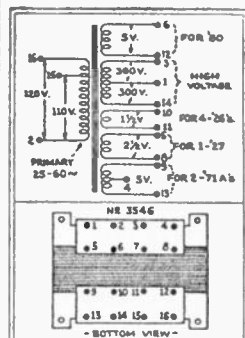
25-60 Cycles



core laminations which insure heavy load. Size 5" x 5 1/2" x 3".  
List Price \$10.00  
No. 1449 Kolster Power Transformer  
YOUR PRICE **\$5.25**

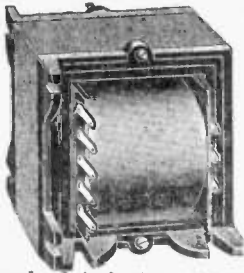
## Kolster General Power Transformer

Part No. 3546 for 25 or 60 Cycles





## Franklin A.B.C. Power Transformer



Make money re-wiring the old battery set. This power transformer replacement supplies 'A', 'B' and 'C' potentials for one '27 (or screen-grid '24) six '26's, two '71A's and one '80 rectifier; total current output of high-voltage winding at maximum output (about 2.0 volts) is 80 ma. High-voltage secondary, filament winding for '27 and for '71A's are center-tapped. May be used in any number of combinations. Suitable for sets.

couple of 4-mf. filter condensers, two 30-henry chokes and by-pass condensers such as listed in this catalog complete fine power pack. Size 3 1/2 x 4 1/2 x 3 inches. Equipped with soldering lugs and full wiring directions. For 110-120 volts, 50-60 cycles. Shipping weight, 7 lbs.

No. 1410—Franklin Transformer with brackets

YOUR PRICE \$3.00

## Philco Power Transformer No. 3400



This Transformer is for replacement use in Philco Model 87 which employs 4 '26, 1 '27, 2 '45 and 1 '80 rectifier tube. The terminal coding is as follows: 1 and 2—high voltage for '80 rectifier plates. 3—center tap for high voltage winding. 4 and 5—5-2 amp. for '80 filaments. 6 and 12—2.5 v. for '45 filaments. 9—center tap for '45 filaments. 8 and 11—'27 Heater (internally center tapped to ground). 7 and 10—1.5 v. for '26 filaments.

NOTE: Just the thing to convert battery sets into A.C. receivers. You only need change a single socket in your old set.

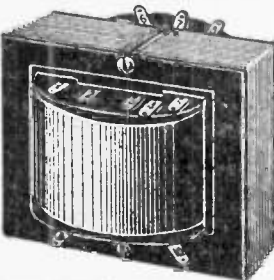
May be used for other receivers having similar tube combination. For 110-120 volts, 50-60 cycles. All connections are underneath transformer, for panel mounting. Shipping weight, 8 lbs.

List Price \$9.00

No. 3400 Philco Replacement Transformer. YOUR PRICE \$2.65

## Thordarson Power Transformer

70 Watts



This transformer may be used in building an inexpensive chassis in which are used, for instance, three stages of R.F., using type '26 tubes, a type '27 detector, a type '27 first audio stage, and a type '71A or '45 output stage.

However, this transformer has sufficient carrying capacity for much heavier demands. For example,

owners of battery-operated superheterodynes will be glad to know that this transformer may be used to power a receiver in which are used four '26's (one stage of signal-frequency amplification and three stages of intermediate-frequency amplification) four '27's (oscillator, first detector, second detector, and first A.F.), and one or two '71's in single or push-pull connection.

Suitable for the home-built rack-and-panel public address amplifier, or cabinet-type phonograph power amplifier. Put one of these back of the test-table, and attach leads to bus-bars; thus, presenting a nearly complete array of voltages for testing purposes. Just the foundation unit for an audio amplifier to be used as a standard of comparison. Well designed. Connections are made to soldering lugs on the two end plates.

This transformer has 5 separate windings:

- No. 1—Primary for 110-120 Volts, 50-60 Cycles. No. 2—Sec. 5 Volts, 2 Amp. (center tapped) for '80 rect. No. 3—Sec. 330 Volts (center tapped), 125 MA. No. 4—Sec. 2 1/2 Volts, 10.5 Amp. for six '27's, etc. No. 5—Sec. 1 1/2 Volts, 14 Amp. for twelve '26's, etc.

Dimensions, 4 1/2 x 4 1/2 in. high. Shipping weight, 6 lbs.

List Price \$12.50

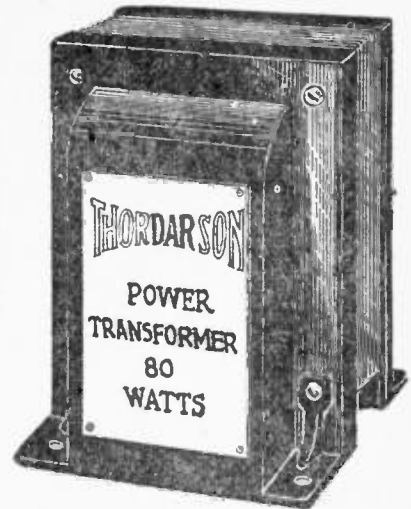
No. 1405A Thordarson Transformer. YOUR PRICE \$2.25

## THORDARSON "245" POWER TRANSFORMER

A Miniature Power Plant — Supplies All ABC Voltages

### Our Most Popular Transformer

80 Watts



Service Men and experimenters! Here is the transformer which will enable you to turn into money that old stock of radio sets equipped only for type '71A tubes; whether single or push-pull. Also, you will be enabled to line up many prospects for new radio sets through contacts made by showing people in your city how their older radio sets may be given a "new lease on life" when the output audio stage is changed over to the type '45 tube.

(Compare the ratings of the '71A and the '45. The former has an undistorted output of only 700 milliwatts; while the type '45 power tube, also operating at its rated plate potential, has a power output rating of 1,000 milliwatts.)

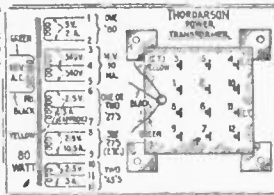
In addition to supplying a full 250 volts to the plates and 50 volts to the grids of two type '45 tubes in push-pull, this Thordarson power transformer may be used to light the filaments of seven or eight 2.5-volt filament tubes; and by connecting in series two of the three 2.5-volt filament secondaries it is possible to light 5-volt filaments too.

Just the power transformer for building up a high-grade public address amplifier to use a screen-grid A.F. amplifier to boost the output of a microphone or phono. pick-up;

following this with two stages of push-pull amplification consisting of two '27's in the first stage and two '45's in the second.

Bottom of transformer has bakelite panel on which are mounted all taps in form of soldering lugs. There are also 3 colored leads, properly color marked. When mounted this transformer looks neat and businesslike.

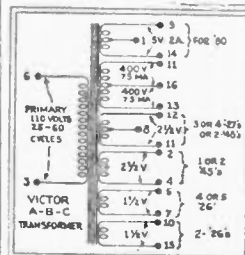
It outperforms ANY similar transformer. Many Service Men keep this model transformer on hand for emergency re-placements in hundreds of makes of radio sets. And service laboratories find this unit a big money-maker as the substitute power transformer when rebuilding "B" eliminators. This conversion



## Victor A-B-C Power Transformer

25 or 60 Cycles

For '27s, '24s, '26s, '80s and '45s



A powerful, electrostatically shielded power transformer designed to safely withstand an overload of 30%. A replacement unit for the Victor RC-32, R-42, RE-45 and RC-75. Excellently suited for the construction of push-pull '45 amplifiers, receivers and public address systems or for re-wiring old battery sets. Has a center-tapped high voltage winding of 800 Volts at 150 M.A. and five filament windings as follows: 1-1 1/2 V. for 4 or 5 '26s; 1-1 1/2 V. for 3 or 4 '27s; 1-2 1/2 V. for 1 or 2 '45s and 1-5 V. for a 280 rectifier. Entirely shielded from hum by its heavy metal container. Obtainable in either 25 or 60 cycles. Size 4 1/2 x 1 1/2 x 3 1/2 in. Shipping weight, 6.10 lbs.

Arrangement of Terminals

No. 1, center tap of 9 and 14 (5 volts). No. 2 and 4, 2 1/2 volts low amp. No. 5 and 7, 1 1/2 volts high amp. No. 3 and 6, primary 110 volts 60 cycles A.C. No. 8, center tap of 12 and 17 (2 1/2 volts). No. 9 and 14, 5 volts for '80. No. 10 and 15, 1 1/2 volts low amp. No. 11 and 13, high voltage 800 volts @ 150 M.A. No. 16, center tap for above. No. 12 and 17, 2 1/2 volts high amp.

No. 1447 Victor A-B-C Power Transformer

For 60 cycles. YOUR PRICE \$2.25

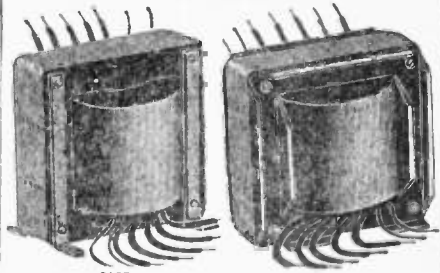
No. 1448 Victor A-B-C Power Transformer

For 25 cycles. YOUR PRICE \$3.25

## Amrad "245" Power Transformer

For "Bel Canto Model 81" Receiver

90 Watts



A big, husky, power transformer of excellent design, particularly recommended to those technicians constructing or re-building radio sets where a case or cover of finished appearance is not a requisite, is Amrad Part No. 8188, a unit designed for the well-known "Bel Canto Model 81" series of radio sets.

When anyone speaks of a "standard screen-grid radio set," it is almost certain that the reference is a receiver having three stages of R.F. amplification, using type '24 screen-grid tubes; a detector, using a type '27 tube; a first stage of A.F., using a type '27 tube; and an output stage using two type '45 tubes in push-pull. (The high voltage D.C. being obtained from a type '80 rectifier.) It is just this combination for which this Amrad power transformer is designed.

An electro-static shield (one of the flexible wire leads) is situated between the primary and the secondaries. It is effective in preventing an objectionable "light-line antenna" action. This effect is manifest, in sets having power transformers not equipped with the shield, as clicks, fading, weak signals, or interference between stations; conditions well-recognized by prominent engineers.

Available in two mountings: special, as "Model 81" replacement; and standard, for all other uses. For 110-120 volts, 50-60 cycles. Both measure, overall, 8 1/2 x 4 1/2 in. high. Shipping weight, 10 lbs.

No. 8188 Amrad Power Transformer. YOUR PRICE \$3.50

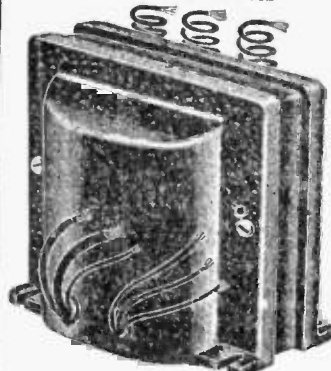
No. 8189 General Power Transformer. YOUR PRICE \$2.95





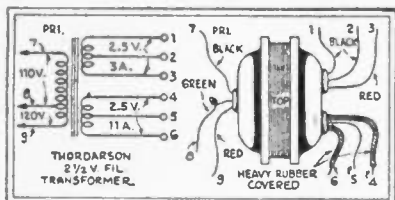


## Franklin 2.5 Volt Filament Transformer 60 Watts



There are two center-tapped windings on this transformer, both of which deliver 2.5 volts. However, one winding is designed to 3 amperes; and the other, 11 amps. Where the set builder or Service Man finds that a set already is "half-electric," that is, equipped with a "B" eliminator but using an "A" eliminator or storage battery,

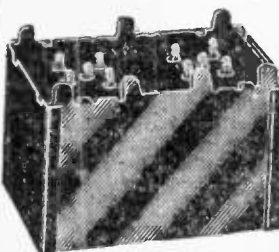
the electrification of the receiver may be completed by using type "26," "27," "24," "45," or a combination of these, depending upon the existing "B" supply; and then lighting the 2.5-volt filaments with this transformer. Pigtail leads. Heavy iron case, beautifully finished in brown crackle. Rating, 60 watts. For 110 to 125 volts, 50 to 60 cycles. Dimensions, 3 1/2 x 5 1/2 in. Shipping weight, 9 lbs.



List Price, \$6.00  
No. 1414 Thordarson 2 1/2-Volt Transformer.  
**YOUR PRICE \$2.65**

## Victor Push-Pull INPUT-OUTPUT AND AUDIO TRANSFORMER

Housed in Single Metal Case

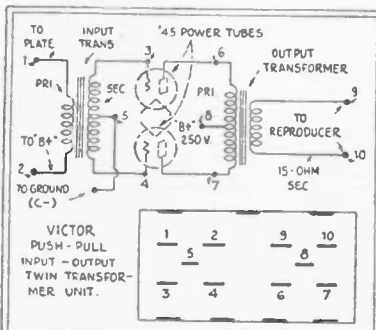


All Terminals are numbered:

- 1-Plate
  - 2-B plus
  - 3-4-Ground
  - 5-Grid
  - 6-Output
  - 7-8-Loud speaker moving coil
  - 9-B plus
  - 10-Plate
- Can be used with 171A, 245 or 250 type tubes. Electrostatically shielded. Impregnated against vibration.

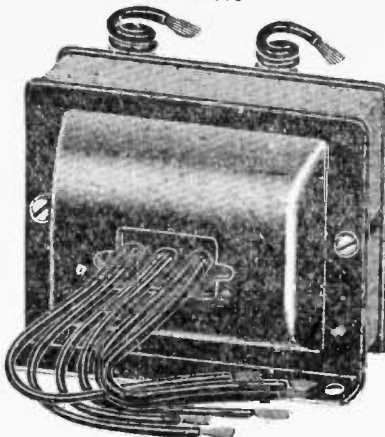
Assuring amplification on all frequencies. Solder lug terminals.

Output matches moving coil on dynamic speakers. Solder lug terminals.

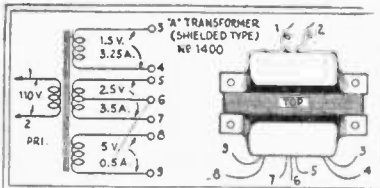


List Price, \$6.00  
No. 1409 Victor Transformer  
**YOUR PRICE \$1.50**

## Shielded "A" Transformer 40 WATTS

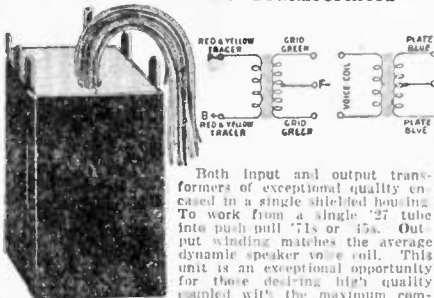


Modernize storage battery receivers by replacing '01A's with '27's and '27's heated by this filament transformer; while using a standard "B" eliminator for plate supply. Potentials of 1.5, 2.5, and 5 volts; the 2.5 volt winding being center-tapped. Because of neat appearance of the black japanned case, unit may be mounted inside receiver and in full view. The Serviceman sometimes uses one transformer of this type temporarily to supply filament current until it is possible to replace the regular transformer that has developed an open filament winding. Handy around the laboratory for experimental use. Pigtail connections. May be used to heat three '26's, two '27's, and two '12A's or '11A's. Of course, for experimental purposes the 5-volt winding may be used to heat five or six type '01A tubes; as this overload will not too greatly overload the 5-volt winding. Rating of transformer, about 40 watts. Dimensions, 3 1/2 x 1 in. For 110-120 Volts, 50-60 cycles. Weight, 3 1/2 lbs.



List Price, \$4.50  
No. 1400 Shielded "A" Transformer.  
**YOUR PRICE \$1.75**

## R.C.A. Push-Pull Transformers



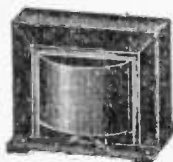
Both input and output transformers of exceptional quality encased in a single shielded housing. To work from a single '27 tube into push pull '71s or '45s. Output winding matches the average dynamic speaker voice coil. This unit is an exceptional opportunity for those desiring high quality sound with the maximum compactness. Shipping weight, 4 lbs.

Overall Dimensions, 5 1/4 x 3 1/2 x 2 1/4 in.  
No. 1440 Victor Input-Output Transformer Unit.

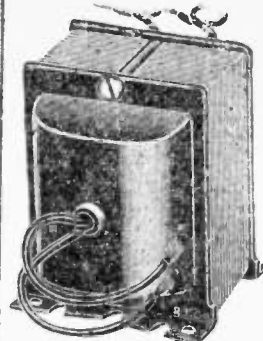
**YOUR PRICE \$0.85**

## "Kenyon" Push-Pull Audio Transformer

Standard input replacement audio transformer used in push pull formation employing 171, 245, and 250 type tubes. Core is of permalloy steel laminations bound by convenient mounting bracket, which also serves as a shield. Dimensions: 2 1/2 x 3 1/4 in.  
No. 1435 "Kenyon" Push-Pull  
**YOUR PRICE \$0.99**  
No. 1435A "Kenyon" Output  
**YOUR PRICE \$0.90**



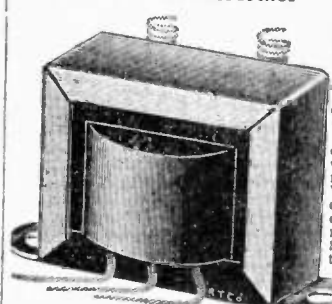
## Filament Transformer, 10 Volts 40 WATTS



This large transformer has only one winding, which delivers 1 amp. at 10 volts. The transformer may be used to light all the 5-volt tubes in a six-circuit receiver by connecting each two tubes in series, and connecting the two leads across the 10-volt transformer. Pigtail connections are supplied for connection to the windings; flexible wires being used for the line tap and the solid secondary wire for the secondary output connections. Dimensions, 3 1/4 x 1 1/2 in. high. Shipping weight, 5 lbs.

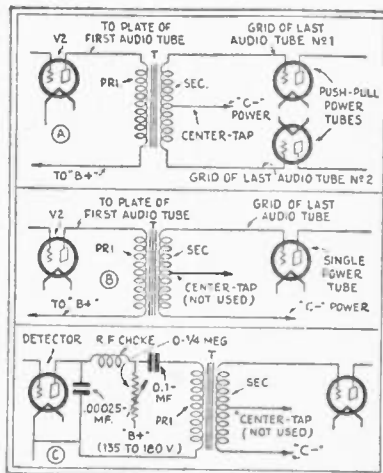
For 110-120 Volts, 50-60 Cycles.  
List Price \$6.00  
No. 1415 10-Volt Filament Transformer.  
**YOUR PRICE \$1.45**

## T.C.A. Push-Pull Input Audio Transformer



May be used to input to any push pull tube combination. Also for 245 or 250 tubes. Secondary is center-tapped. Core is encased by an iron cover provided with two mounting feet. Winding thoroughly protected against moisture. Stranded pigtail leads.

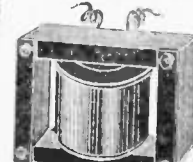
Handy replacement unit for Servicemen; may be used as input transformer for a single tube by using two outside secondary leads. Several diagrams for convenient hookups are given here. Measures only 2 1/2 x 3 1/4 in. Weight, 2 lbs.



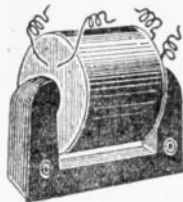
List Price, \$4.00  
No. 1428-T.C.A. Audio Transformer.  
**YOUR PRICE \$0.90**

## Dynamic Voice Coil Transformer

A high quality output transformer to work from single or push-pull '71 or '45 tubes into the moving coil of the average dynamic speaker. Shipping weight, 1 lb.  
List Price \$1.00  
No. 1418 Dynamic Voice Coil Transformer  
**YOUR PRICE \$0.60**



## Replacement Audio Transformer



This transformer is for replacement in the Ware receivers or in any other sets employing this type of mounting. 3 1/2 to 1 ratio. Shipping weight, 1 lb. List Price \$1.00

No. 1475 Replacement Audio Transformer.  
YOUR PRICE **\$0.45**

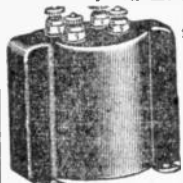
## Fada Replacement Audio Transformer



This high quality audio transformer may be used for replacement in all FADA receivers or in other sets where a small but efficient transformer is required. Mounted in shielded case with soldering lugs for easy connection. Ratio 3 1/2 to 1. Shipping weight, 2 lbs.

List Price \$3.00  
No. 1476 FADA Replacement Transformer  
YOUR PRICE **\$0.50**

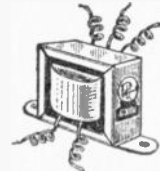
## Erla E. F. Transformer



This Erla product may be used for general service replacement in all radio receivers. With mounting feet and four binding posts at top for connections. Shipping weight, 1 1/2 lb. Overall size, 1 1/2 x 2 1/2 x 2 1/2".

No. 1424 Erla A.F. Transformer.  
YOUR PRICE **\$0.80**

## Polymet Audio Transformers



Interstage  
Push-Pull  
and  
Output  
Types

Genuine Polymet audio transformers, small, compact, carefully constructed and highly efficient. Designed to meet the requirements of both the custom set builder for new work and the service man for replacement purposes. Accurately spaced coil windings carefully balanced with high grade Silicon steel laminations. Provides proper amplification without distortion. Core is shielded with heavy metal strip provided with mounting flanges. For sub-panel or conventional mountings. Shipping weight, 1 1/2 lbs.

### MOST POPULAR TYPES

No.	Description	List Price	YOUR PRICE
1480	TA730—3 to 1 ratio interstage	\$1.50	<b>\$0.85</b>
1481	TA731—3 to 1 ratio push-pull in ut	1.75	<b>\$1.15</b>
1482	TA732 dynamic output from 215, 171A and 250 single	1.50	<b>\$0.95</b>
1483	TA733 dynamic output from 247 P.P.	1.50	<b>\$0.85</b>
1484	TA731 dynamic output from 215 P.P.	1.50	<b>\$0.85</b>
1485	TA735 dynamic output from 247 single	1.50	<b>\$1.05</b>

### POLYMET 25 HENRY FILTER CHOKES

No.	Description	List Price	YOUR PRICE
1486	TC796 25 mills—830 ohms	1.50	<b>\$0.60</b>
1487	TC797 60 mills—300 ohms	1.50	<b>\$0.60</b>

## Kolster Cylindrical Audio Transformer

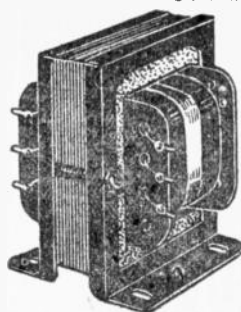


This transformer may be used for replacement in those Kolster receivers employing the cylindrical type of transformer shield. They may be used as interstage transformers for replacement purposes in any receiver requiring a high quality device. Overall size 2 1/2" x 3 1/2" long. Shipping weight 2 1/2 lbs.

List Price \$4.00  
No. 1445 Kolster Cylindrical Audio Transformer  
YOUR PRICE **\$0.95**

## Thordarson Inter-Stage Push-Pull Audio Transformer

2-1 Ratio



A newly developed inter-stage push-pull audio transformer for double push-pull amplifiers. Has specially designed 1.0 core laminations to reduce eddy-current losses and insure an indiscriminating response to all audio frequencies. Excellent for coupling push-pull '26s or '27s to push-pull '71As, '10s, '45s or '50s. Ruggedly constructed and equipped with suitable mounting brackets. Size 3 1/4" x 3 1/4" x 3 1/4". Shipping weight, 3 1/2 lbs. List Price \$12.00

No. 1446 Thordarson Inter-Stage Push-Pull Transformer  
YOUR PRICE **\$2.10**

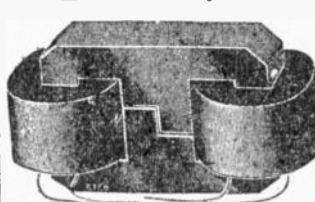
## "Mike" and Phono-Pickup Input Transformers



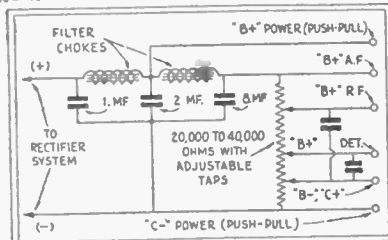
Genuine Polymet transformers which provide just the right amount of gain to feed microphone or phono-pickups into all type amplifiers.  
No. TRM3 Single Button 200 ohm Mike Transformer.  
No. TRM4 Double Button 100 ohm each Mike Transformer.  
No. TRL3 2508 to 3000 ohm Phono-pickup Input Transformer.

List Price \$5.00  
YOUR PRICE **\$1.10**

## Earl 30 Henry Double-Choke



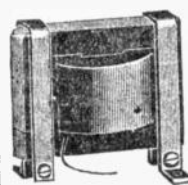
Power pack filter choke. Two enameled-wire windings on a "B"-shaped iron core. Use in packs for single and double 1A output tube receivers. Very compact. Fine for jobs where space is at a premium. Maximum current, series connected, 45 ma.; if parallel connected, 90 ma. Suitable for filtering the supply to a photoelectric pre-amplifier, a small microphone or phonograph pickup amplifier, or a single-stage power amplifier using a single '10 or '45. A justable air-g.p. Dimensions, 2 1/4" x 2 1/4" x 4 1/2" in. Shipping weight, 3 lbs.



List Price, \$6.50

No. 1408 Earl Double Choke.  
YOUR PRICE **\$1.05**

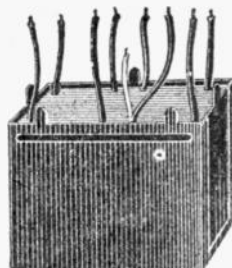
## Earl 30 Henry Filter Chokes



A neat filter choke of small dimensions. May be used in all "B" supply units up to 250 volts where the current does not exceed approximately 30 m. a. Laminated iron core having air gap; impregnated as a protection against atmospheric action. Equipped with pig-tail leads one of which is tinned for identification. Two strap irons hold laminations in place and provide two mounting feet. Shipping weight, 1 lb. Overall size, 1 1/2" x 3 1/2" in. high.

No. 1443 Earl 30 Henry Filter Choke.  
YOUR PRICE **\$0.70**

## Kolster Double Transformer Unit



This is Kolster Brandes part No. B-10. Two ACCURATELY MATCHED interstage A.F. transformers housed in a single shielding can. The unit may be used in the construction of new receivers or for replacement work in Kolster or Brandes receivers. Electrostatically shielded. Neat, compact, efficient. Service men should keep at least one of these units on hand for servicing the better grade receivers where ACCURATELY MATCHED audio transformers are of the utmost necessity. Overall size 4 1/2" x 2 1/2" x 3 1/2". Shipping weight, 4 lbs.

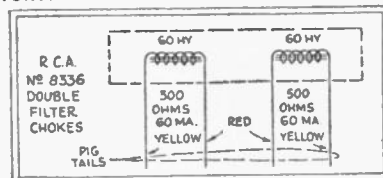
List Price \$5.00

No. 1432 Kolster B-10 Double Transformer Unit.

YOUR PRICE

**\$1.50**

## R.C.A. Double Filter Choke No. 8336



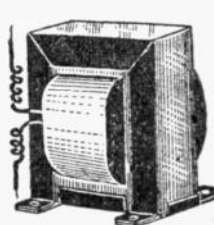
This heavy-duty, extremely strong, double filter choke can be used for all types of filter circuits, experimental work, power amplifiers, receivers, eliminators, power packs, converted sets, etc. Known as R. C. A. replacement part for all Radiola models, particularly Nos. 35, 51, 17 and 18. Each choke is designed for 1,000 volts, D. C. resistance, 500 ohms. Connected in parallel, these double filter chokes have a capacity of 15 Henries at 160 Mills; connected in series, 60 Henries at 80 Mills. Fully shielded in heavy metal case with special insulating compound. Size, 5 1/2" x 2 1/2" x 6 lbs. Shipping weight, 6 lbs.

List Price, \$10.05.

No. 8336 P.A. Choke.  
YOUR PRICE **\$0.75**

## Kolster Heavy Duty Filter Choke

30 Henries—110 Mills



Manufactured by the Kolster Co. for their 210 and 250 push-pull receivers. Will safely handle 110 mills plus an overload of 15%. Replacement for Kolster models 20, 21, 22, 23 and for Columbia models C-1, 2, 3 and 4. Standard 30 Henry filter choke with a D.C. resistance of 500 ohms. Sturdily constructed and provided with excellent mounting facilities. Measures 3 1/2" x 2 1/2" x 1 1/2". Shipping weight, 3 lbs.

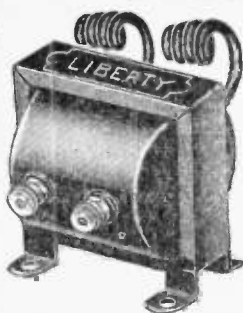
List Price \$2.75

No. 1488 Kolster Heavy Duty Filter Choke  
YOUR PRICE **\$0.95**



## Liberty Bell Ringing Transformer

110 V.A.C. to 8 Volts



Specialty manufactured for energizing door bells, buzzers, etc. Aside from its conventional use however, the ingenious radio technician, serviceman or experimenter can adapt this unit to a variety of radio uses.

### MULTIPLICITY OF RADIO USES

Can be used as a microphone input transformer by using the low voltage winding as the primary. With the proper resistance in series it will easily light one of almost any type of radio tubes. Using this transformer (which incidentally is a featherweight compared to most filament transformer) as the "A" supply; one can readily build a portable one tube short wave or broadcast receiver. The transformer weighs less than even one ordinary dry "A" cell.

Ruggedly constructed of the finest material available, with heavy iron core laminations to reduce eddy current losses to a minimum. Equipped with two heavily insulated leads for the 110 volt A.C. line and two binding posts for the 8 volt A.C. secondary winding. Put up in an enameled metal shield case. Shipping weight, 1 lb.

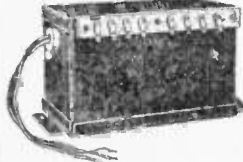
List Price \$1.75

No. 1479 Bell Ringing Transformer

**\$0.75**

## Jefferson Power Pack—Choke Unit

For '25, '27, '71A and '80 Tubes



This unit consists of a standard Jefferson power transformer and a 30 henry 500 ohm filter choke. Both are mounted in a sturdy, compact, metal case, equipped with convenient terminal strips and mounting flanges. JUST THE THING TO CON-

VERT OLD TYPE BATTERY SETS INTO MODERN ALL-ELECTRIC AC RECEIVERS. The power transformer will safely handle 5-225, 2-225, 2-171A's and an '80 rectifier. The filter choke is of standard design and has sufficient DC resistance to cut down the high voltage to the requisite 180 volts for the plates of the 171A power tubes. The only additional parts necessary to construct a complete power pack for AC receivers, power amplifiers or public address systems are of filter condenser bank and a voltage divider. These latter units can be furnished upon request.

The transformer is designed for 110-120 volts 50-60 cycles operation, and has the following specifications: 5 volts at 2 amps, 5 volts C.T. at 0.5 amps, 1 1/2 volts at 5.25 amps, 2 1/2 volts C.T. at 3.5 amps, and 500 volts C.T. at 60 mills. Complete instructions for hooking up and wiring is supplied with each unit. Shipping weight, 10 lbs.

List Price \$10.00

No. F1499 Jefferson Power Pack Choke Unit

**\$2.75**

## Intermediate Frequency Transformers

450 and 175 Kilocycles



These are doubly tuned, fixed frequency transformers, 1 to 1 ratio, the one tuned to 450 kilocycles but adjustable from 400 to 500 and the other tuned to 175 kilocycles but adjustable from 100 to 190 kilocycles. Both are for use in super-heterodyne receivers. Two loosely coupled, double resonant, high-inductive choke coils constitute the primary and secondary. Suitable for all uses where 100% SELECTIVITY WITHOUT SIDE BAND CUTTING is desired.

The transformer may be mounted on the side of a chassis, in horizontal position, or upright either above or below the chassis top. Tuning condensers are across primary and secondary, both readily accessible. Equipped with aluminum shield 2 1/2" diameter and 2 1/2" high with removable top. For screen grid tubes. Shipping weight, 1 lb.

List Price \$5.00

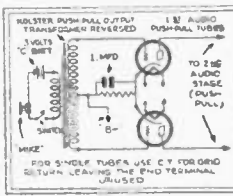
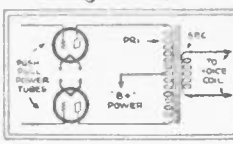
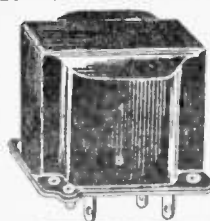
No. 1495 450 K.C. Intermediate Frequency Transformer

No. 1496 175 K.C. Intermediate Frequency Transformer

**\$2.65**

YOUR PRICE

## Kolster Push-Pull Output Transformer



For Dynamic Speakers Will operate from push-pull '71As, '10s or '60s. Has a low impedance secondary which matches the speaker coil impedance of most dynamic speakers. Constructed of the finest material available. Has the typical Kolster heavy iron core laminations which insure low-loss operation. May be used as a single-button microphone input transformer by reversing the transformer and using the secondary as the primary and vice-versa. A handy replacement and experimental unit for service men and experimenters. Several diagrams for convenient hook-ups are given here. Measures 3 1/2" x 2 1/2" x 2 1/2". Shipping weight 3 1/2 lbs.

List Price \$3.50

No. 1465 Kolster Push-Pull Output Transformer

YOUR PRICE

**\$0.05**

## Kolster Dynamic Output Transformer

Kolster Part No. 1936

A high ratio, single power output transformer for feeding into the voice coil of a dynamic speaker. A Kolster replacement part for Brundage and Columbia receiver but adaptable to any other receiver which employs a single output power tube. Constructed with the typical Kolster heavy duty iron core laminations and metal shield case as our No. 1465. Measures 3 1/2" x 2 1/2" x 2 1/2". Shipping weight, 3 1/2 lbs.

List Price \$2.50

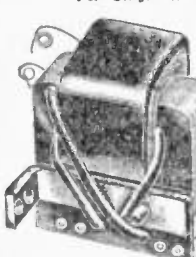
No. 1466 Kolster Dynamic Output Transformer

YOUR PRICE

**\$0.75**

## Microphone Input Transformer

For Single or Double-Button Mikes



An extremely small and compact microphone transformer that is highly popular with amateurs, professional and experimenters. Primary impedance matches the impedance of all the popular microphones both of the single and double-button types.

Ruggedly constructed of heavy duty iron core laminated frame, brass mounting bracket and three terminal strip. Has center-tapped high current primary and high ratio secondary. Measures 1 1/2" x 2 1/2" x 1 1/2". Shipping weight, 1 1/2 lbs.

List Price \$4.50

No. 1468 Microphone Input Transformer

YOUR PRICE

**\$0.85**

## Scratch Filter For Phono Pick-Ups

Completely Eliminates Disc Noises

A unique, cleverly designed unit which completely eliminates all rushing and scratching noises of electrical phonograph pick-up devices as they bear down upon their recording discs. ABSOLUTELY ESSENTIAL TO THE PERFECT REPRODUCTION OF PHONOGRAPH MUSIC. Consists of a small match impedance audio filter inductance and two minute condensers in a typical filter-circuit arrangement. Designed to completely choke and bypass "scratch" frequencies.

This small and compact—Easily Installed. This efficient filter unit is extremely small and compact, measuring but 1 1/2" high and 1" square and weighing but 4 ozs. It is easily and permanently installed in a few minutes. Merely break one of the leads from the phono pick-up, attach the severed ends to terminals 2 and 3 and then ground terminal four. That's all there is to it. Recommended for use in theaters, schools, homes, vacation resorts and all other places where noise-free musical entertainment is called for. Shipping weight 1/4 lb.

List Price \$1.00

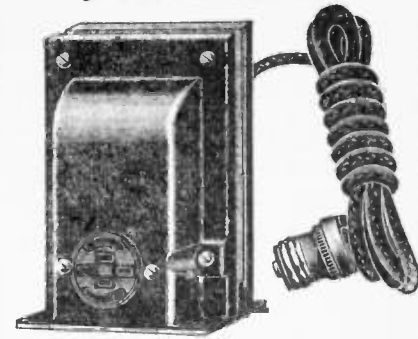
No. 1789 Scratch Filter for Phono Pick-Ups

YOUR PRICE

**\$0.30**

## Radiart Step-Down Transformer

220 to 110 Volts at 50-60 Cycles



A fully shielded, ruggedly constructed step-down transformer for use in conjunction with A.C. radio receivers, amplifiers, public address systems, and other radio and electrical apparatus rated at 110 volts 50-60 cycle where only 220 volts are available. Enables Canadians, Suburbanites and foreign radio enthusiasts restricted until now to reap the full benefits of the latest 110 volt A.C. radio developments. Accurately constructed with the proper turns ratio and fully shielded in beautiful black enamel case of heavy silicon steel laminations insuring cool performance under heavy load.

May Be Used as Step-Up Transformer Too

By reversing the transformer, i.e., by using the secondary the primary, and the primary as the secondary it is possible to step up 110 volts at 50-60 cycle to 220 volts thus doubling the value and utility of this unit. It should be understood, however, that when used this way the transformer should not be subjected to as heavy a load as it would ordinarily stand when used to step down voltages. Sold complete with polarized bakelite outlet receptacle, 6 ft. heavy duty electric cable and two three-pronged female plug. Guaranteed to give perfect results. Available in two sizes 75 and 150 watts. Shipping weight 7 lbs.

No. 1477 Radiart 75 W. Step-Down Transformer

List Price \$6.00

YOUR PRICE

**\$3.00**

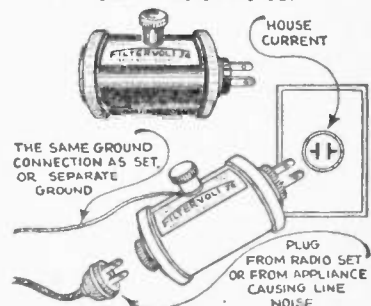
No. 1478 Radiart 150 W. Step-Down Transformer

YOUR PRICE

List Price \$10.00

**\$3.75**

## I.C.A. Filtevolt Jr.



The I.C.A. FILTEVOLT, JR., is the now famous Light Duty Noise Eliminator that eliminates noises caused by electric heating pads, switching on and off of lights, electric toasters, vacuum cleaners, small motors of 1/16 horsepower or less, and minor disturbances caused by electric appliances.

Service men very often receive complaints from their clients of intermittently noisy and crackling reception. The Filtevolt Jr., is a sure cure for such troubles.

I.C.A. Filtevolt, Jr., is recommended to be installed at the source of interference. It may also be installed at the radio set. A small compact unit. Housing body made of black enameled metal with brass nickel plated end rings. Packed in an attractive individual carton with a simple instruction sheet enclosed. Shipping weight, 1 lb.

List Price \$3.00

No. 2239 I.C.A. Filtevolt Jr.

YOUR PRICE

**\$1.70**

## I. C. A. Filter-Volt Senior

A heavy duty line filter which acts on both sides of the house line. Completely eliminates all man-made static. Contained in handsome Japanese metal case. Measures 5 1/2 x 6 1/2 x 3 1/2 inches. Shipping weight, 7 lbs.

List Price \$15.00

No. 3901 Filter-volt Sr.

YOUR PRICE

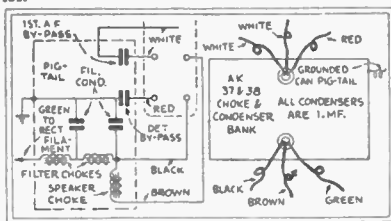
**\$8.45**



## Atwater-Kent 37-38 Filter Choke and Condenser Block



Contains two filter chokes, a speaker output choke, two high-voltage filter condensers, a detector by-pass condenser, and an R.F.-A.F. by-pass condenser, each connecting lead being identified by colors. The metal case is the low-voltage side of the condensers, and is to be grounded. A flexible lead soldered to the can is ready for you. Rubber grommets protect the pigtail leads where they pass through the shield can. May be used as replacement in standard receivers of the "20's," "27's," "71A" type. To make up a compact and efficient power pack for a receiver using a type "71A" output tube you will need only a rectifier tube socket, a voltage divider, a power transformer, and this complete filter block; containing as it does the full complement of filter and by-pass units. It is of special interest that the filter chokes used in this pack have very high inductance. Consequently, to obtain a hum-free output it is not necessary to use higher value filter condensers than the two 450-volt, working potential, 1. mf. condensers supplied. The by-pass condensers also are 1. mf., but 300 volts working potential. The color code is as follows: Red lead, detector "B" by-pass; green, to rectifier filament; black, to "B" plus of R.F. tubes; brown, to plate of power tube; two white leads, first A.F. "B" plus by-pass, the second or return white lead connecting to the center-tap on the first A.F. filament resistor. Dimensions,  $3\frac{1}{2} \times 1\frac{1}{2} \times 5$  in. Shipping weight, 6 lbs.



List Price, \$7.50  
No. 1800-283 A. K. 37-38 Condenser Choke. **\$3.25**  
YOUR PRICE

## Clarostat Automatic Line Voltage Regulator



The Clarostat line voltage regulator is not a mere voltage reducer but a scientifically designed regulator for use in districts where excessive or unsteady line voltage is encountered. Made in four types as follows:

Type A—for sets consuming 100 watts or less. Type B—for sets consuming 100 to 150 watts. 200 Watt—for sets consuming 150 to 200 watts. 250 Watt—for sets consuming 200 to 250 watts.

State which type desired. Shipping weight,  $\frac{1}{2}$  lb.

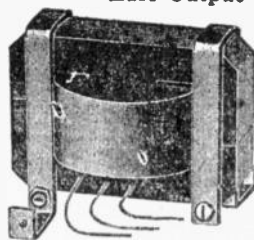
List Price \$1.75  
No. 2233 Clarostat Automatic Line Voltage Regulator **\$1.05**  
YOUR PRICE

## R.C.A. Radio Frequency Choke

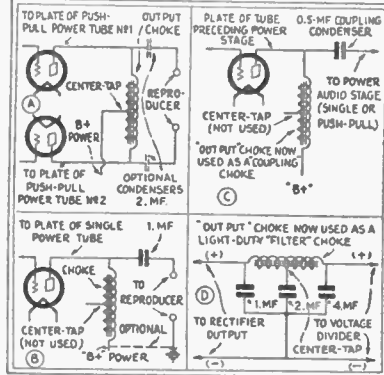


A small universal wound choke coil for use as an R.F. choke in all circuits. For replacement in Radiola Sets or for construction purposes. Shipping weight, 1 oz. Diameter  $1\frac{1}{4}$ "  
No. 144 R.C.A. Radio Frequency Choke. **\$0.15**  
YOUR PRICE

## Earl Output Choke



Center-tapped. May be connected push-pull, using "71A" power tubes, with speaker wired from plate to plate (as in Earl Model 21 A.C.); or in plate circuit of single power tube, with speaker connected shunting the choke (as in Freshman Model 121). Current rating, 30 ma. May be used as the coupling choke in detector or first audio plate; or as the plate impedance in a "parallel-plate-feed" audio system, by using the full winding. A suitable filter choke, where only a few tubes are used. May be used to filter the plate supply to R. F., detector, or A. F., when by-passed by a condenser of at least 1.0 mf. capacity. Enamelled wire, each layer insulated. Com. with mounting brackets. Core of high-grade E-I laminations. Dimensions,  $3 \times 3 \times 3$  in. Shipping weight, 3 lbs. Several convenient hookups are given here for your convenience.



List Price, \$6.00.  
No. 1407 Earl Choke. **\$0.95**  
YOUR PRICE

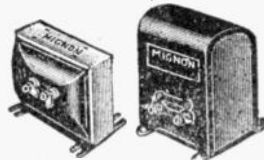
## Thordarson 30 Henry Choke



A 30 Henry choke for use in coupling output tubes to magnetic speakers or in small "B" eliminators or midjet receivers as a filter choke. Complete with mounting brackets and provided with soldering lugs for connection. A general purpose replacement choke for any receiver where a 30 Henry choke is required. Shipping Weight, 1 lb. Overall Size,  $2\frac{1}{2} \times 2\frac{1}{2} \times 3\frac{1}{2}$  in.

No. 1442 Thordarson Choke. **\$0.80**  
YOUR PRICE

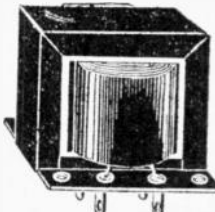
## Mignon Audio Transformers



Mignon audio transformers are precision instruments of advanced design and construction. The experience of more than 20 years of scientific development are in the construction of these transformers. Sealed in enamel metal case to prevent moisture from getting into the coils. Highest grade materials are used in the manufacture of these transformers. Special laminated core and also nickel binding posts mounted on Bakelite insulation. Available in two sizes; midjet and junior. The midjet type is for sub-panel mounting whereas the junior type in its beautiful black enamel stippled case is for mounting above the sub panel. Shipping weight, 2 and 3 lbs. respectively.

List Price \$2.75  
No. 1437 Mignon Junior Transformer **\$0.69**  
YOUR PRICE  
List Price \$2.50  
No. 1438 Mignon Cub Transformer **\$0.65**  
YOUR PRICE

## Kolster High Inductance Audio Transformer

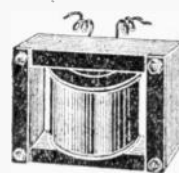


This is an unshielded transformer having a high primary inductance for working from a "bias" detector into the first A.F. stage. It is excellent for use in any receiver using this type of detection where a high inductance winding is necessary for good quality. Kolster part No. 1937B.

Either the primary or secondary of this unit when used in conjunction with a 1 mfd. condenser may be employed as an output filter system which improves the tonal qualities of any receiver or amplifier and which protects the loud speaker from the injurious direct plate current. Shipping weight, 3 lbs.

List Price \$4.00  
No. 1439 Kolster High Inductance Audio Transformer **\$0.85**  
YOUR PRICE

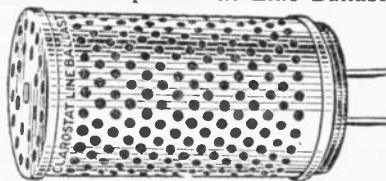
## RCA 15 Henry Filter Chokes



These filter chokes have an inductance of 15 hy. at 40 M.A. and have a D.C. resistance of 500 ohms. Two of these chokes connected in series give a total inductance of 30 hy. They may be used to effect an inexpensive replacement in most "B" eliminators or electric sets. Shipping weight, 2 lbs.

No. 1417 RCA 15 Henry Filter Choke. **\$0.25**  
YOUR PRICE

## Clarostat Replacement Line Ballasts



Certain receivers are designed to operate with primary inputs of 85 volts for purposes of voltage regulation. In normal receivers with 110 volt primaries use the Clarostat automatic line voltage regulator. In those receivers intended for use with line ballasts use the following Clarostat Ballasts.

Belmont—2518; Bremer Tully—2169; Brunawick—2179; Clarion—2408; Grebe—6412; HIFI—1210; Hi Q 30—2179; Hi Q 31—2408; Kennedy—6412; Klyctron—6310; Larkin—6314; Majestic 70—1516; Majestic 72—1508; Majestic 80—1012; Majestic 100—1210; Nathaniel Baldwin—2516; Peerless—6310; Persen—2500; Scott—2179; Silver—2179; Simplex—2516; Sonora—2179; Star Ralder—2100 (two ballasts required); Starck Piano—2518; United Reproducer—6310.

Shipping weight,  $\frac{1}{2}$  lb.  
List Price \$2.50  
No. 2235 Clarostat Replacement Line Ballasts **\$1.60**  
YOUR PRICE

## Heavy Duty Line Voltage Regulator



A line voltage regulator for use with large receivers and amplifiers. Has large radiating surfaces for dissipation of heat. Shipping weight, 1 lb.

List Price \$2.50  
No. 1676 Heavy Duty Line Voltage Regulator. **\$0.60**  
YOUR PRICE

## Line Voltage Regulator



An air-cooled, nickel plated voltage regulator for use in localities where the line voltage fluctuates. Saves tubes from burning out due to excess line voltage. Shipping weight,  $\frac{1}{2}$  lb.

List Price, \$1.75.  
No. 1649 Voltage Regulator. **\$0.60**  
YOUR PRICE

Gentlemen:

Received your RADIO SERVICE TREATISE some days ago and want to thank you for it. I have often wondered why some enterprising Co., did not put out something of the kind.

In this day of Electricity, nearly everybody wants an electric set, but, hesitates to give up a fine battery set for the price a dealer can allow them for it, but many are willing to spend some money to change the set over. Your innovations and pioneering in this line should bring you results beyond your fondest expectations.

H. W. WILKEY, Peoria, Ill.



## "Concourse" Dry Electrolytic Condensers—Puncture and Surge Proof

500 VOLT PEAK—The Latest and Most Modern Filter Unit



Cat. Nos. 1814 and 1824

Cat. Nos. 1816 and 1832

Many times it is desired to mount a filter condenser, in a horizontal position, or inverted, etc. (impossible with liquid-type electrolytic condensers). These dry units will not freeze in cold weather. With surprising compactness, far greater number of microfarads can occupy any given space and at the same time the electrolytic condenser is FAR LESS EXPENSIVE, too. For all practical purposes they can be handled and mounted in the same manner as paper condensers. The high voltage characteristic (500 volts D.C. peak without series connections) permits their use in most of the standard comparatively high voltage supply units. The filtering action of this type of condenser is equivalent per microfarad to that of wax paper condensers and, being more compact, they can be used to replace paper condensers in filter and audio by-pass circuits. Their self-healing and surge-proof characteristics prevent damage to the condenser from high voltage surges and increase the life of the condenser indefinitely. Because of the very low cost per microfarad and the compactness of these units, it is practical to use much higher capacity in the filter and by-pass circuits with consequent better filtering action, better tone quality and greatly reduced hum, without increase in cost. Build up the filtering circuits in your power packs with as much mfd. capacity as possible, for the best word in perfect reproduction, entirely devoid of any hum. Encased in a handsome aluminum container. Do not deteriorate without use! Judiciously used in many parts of any R.F. or A.F. circuits, in power packs, in dynamic speakers, they will perform miracles in eliminating any trace of objectionable A.C. hum or other incidental disturbances. These electrolytic condensers are particularly recommended for 250 power packs—however, in that part of the circuit where the working voltage of the raw A.C. is 800 volts, two electrolytic condensers in series will stand up indefinitely. In other words, if you desire to use 8 mfd. as one of the filtering condensers, you install TWO of them, both wired in series. Always keep a few of these extremely useful condensers in every capacity on hand to meet every emergency.



Nos. 1801, 1802, 1804, 1808

Note: — Convenient mounting screw on base — fastens to any base.

Catalog No.	Total Cap.	Cap. Each Anode	No. of Anodes	Size	Shipping Wgt. Lb.	Peak V.	List Price	Your Price
1801	1 mfd.	1	1	2 1/4-in. x 3/4-in.	1 1/2	400	\$ .60	\$ .28
1802	2 mfd.	2	1	2 1/4-in. x 1-in.	1	450	\$ .95	\$ .45
1804	4 mfd.	4	1	2 1/4-in. x 1 1/4-in.	1	500	\$ 1.75	\$ .85
1808	8 mfd.	8	1	4 1/4-in. x 1 1/4-in.	1	500	\$ 2.50	\$ 1.25
1814	14 mfd.	2-4-8	3	4 1/4-in. x 3-in.	2	500	\$ 6.00	\$ 2.85
1816	16 mfd.	8	2	4 1/4-in. x 3-in.	2	500	\$ 4.25	\$ 2.13
1824	24 mfd.	8	3	4 1/4-in. x 3-in.	2 1/4	500	\$ 5.50	\$ 2.75
1832	32 mfd.	8	4	4 1/4-in. x 3-in.	3	500	\$ 6.75	\$ 3.38
1854	54 mfd.	18-18-9-9	4	4 1/4-in. x 3-in.	4	500	\$ 9.50	\$ 4.75

## Polymet Electrolytic Condensers

Guaranteed to be Surge Proof



Polymet's highly perfected Electrolytic Condensers meet radio's latest requirements of high capacity in small space and low cost per microfarad. They are "self-healing," even though temporarily subjected to excess voltage. The condensers consist of a formed aluminum anode, an aqueous solution, and a metal container. Proper design and careful manufacture are reflected in their very low leakage characteristic, which has firmly established the Polymet Electrolytic Condenser as the leader among such capacitors. Peak voltage is 420 volts, and recommended working voltage is 375 volts.

### Convenient Mounting Facilities

The inverted single unit Electrolytic Condenser has become the most widely used of all types, as the anode terminal at the bottom meets the requirements of concealed wiring in accord with the most modern practice. Single hole mounting permits rapid and easy production assembly.

The Polymet large multiple-unit Electrolytic Condenser is designed for strain mounting. It offers higher capacities within one container, a standardized can three inches in diameter. Anode terminals are on top.

No.	Capacity	No. of Anodes	List Price	YOUR PRICE
3808	8 mfd.	1	\$2.50	\$0.89
3816	16 mfd.	2	3.75	\$1.75
3824	24 mfd.	3	5.00	\$2.10

## Concourse Electrolytic Py-Pass Condensers

For C-Bias Work On '45-'10-'50 and Pentodes



With the modern high-power output tubes a shorted by-pass condenser produces an enormous increase of plate current, sufficient in most cases, to permanently injure the tube or tubes. These dry electrolytic by-pass condensers, entirely surge-proof, are especially made to remedy this evil. They are small, and compact and may be mounted either above or below the chassis by means of the shroud mounting screw which, incidentally, is also the cathode terminal. There is another important effect of C-bias breakdown. The modern set usually draws all of its plate current from a single rectifier tube (usually the 80 type) and, as these tubes are often operated at very nearly their maximum current, the increase of the current flow in the power tube circuit often causes failure of the rectifier.

Electrolytic condensers may cost a bit more than paper condensers but, considering their long life and efficient operation they constitute a considerable saving in the long run. Shipping weight, 6 oz.

No. 1805	5 Mfd. Dry Electrolytic Condenser @ 50 volts	YOUR PRICE	\$0.38
No. 1810	10 Mfd. Dry Electrolytic Condenser @ 25 volts	YOUR PRICE	\$0.38

## Concourse Tubular By-Pass Condensers

Midget Non-Inductive Type



Absolutely the smallest, yet efficient, tubular by-pass condensers on the market. Measures, but 1 1/2" long and weighs but 4 oz. Guaranteed to withstand 250 volts. These units are not surplus merchandise but regular stock items. Are provided plug-tail leads for convenient connections.

No.	Capacity in Mfd.	List Price	YOUR PRICE
1793	0.1	\$0.45	\$0.21
1794	Double 0.1 unit	.70	\$0.32
1795	0.25	.50	\$0.22
1796	0.5	.60	\$0.27
1797	1.0	.70	\$0.32

For dozen lots, deduct 3% from total amount.

## "RTC" High-Voltage "Puncture Proof" Filter Condenser Units

We guarantee these condensers unconditionally. There may be cheaper condensers on the market but we do not carry these because we could not stand behind them. These condensers are ideal for general replacement purposes and can be installed in any new power-pack.



We recommend that service men and radioicians have on hand a number of such units of the various capacities and voltages to meet all emergency cases. We believe that these condenser

sections are the most compact on the market. All condensers go through a series of special tests after the condenser has been wound and assembled and after it has been thoroughly impregnated and vacuum-sealed with a special grade of insulation compound before shipment. All condensers are furnished with 8-inch lengths of tinned "push-back" wire.

Cat. No.	Mfd. Capacity	Your Price	In Dozen Lots
1702	1/2	25c	\$2.98
1703	1	30c	3.45
1704	2	40c	4.60
1705	4	80c	6.75
800 Volts			
1706	2	45c	\$5.05
1707	4	75c	8.40
1708	4	\$1.10	12.40
1,000 Volts			
1709	2	75c	\$8.40
1710	2	\$1.10	12.40
1711	4	1.60	18.20

Shipping weights approx. 1/2 lb. per M.F.D.

## "RTC" Encased, High-Voltage "Puncture Proof" Filter Condenser Units



These are similar to our regular RTC condensers, except that they are encased in a special impregnated fiber board case, which comes in various attractive colors. Instead of the loose wires, we provide long soldering lugs. This makes a very neat and compact unit, highly recommended by all service men who have tried them.

All RTC units come with a one full year free replacement guarantee.

These condensers are scientifically designed, built and rated to operate safely at their rated working voltages. The safety factor is in excess of that required to withstand both their R.M.A. and N.E.B.A. retest requirements. These condensers are scientific y impregnated by means of a new vacuum process. The special impregnation compound used has a high melting point of 175 degrees Fahrenheit, protecting condenser against heat developed in modern amplifier units. Old type paraffin condensers still used and sold by many firms have approximately 130 degrees Fahrenheit melting point. All dielectric material used in these condensers is pure 100 per cent. linen paper, free from acid, alkali, leaching material and impurities. Only the best aluminum foil is used in their manufacture.

Cat. No.	Mfd. Capacity	Your Price	In Dozen Lots
3703	1	30c	\$3.42
3704	2	40c	4.56
3705	4	70c	7.98
600 VOLTS			
3706	1	35c	3.95
3707	2	45c	5.10
3708	4	80c	9.10

Shipping weight approx. 1/4 lb. per M.F.

## Aerovox Mica By-Pass Condensers



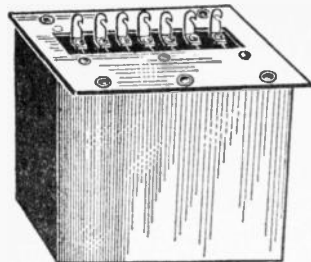
Genuine Aerovox formula by-pass condensers permanently sealed in high grade moulded Bakelite. Sturdily built and entirely protected from all atmospheric conditions. Condenser leads are of the universal mounting type and are set firmly into the Bakelite housing. May be mounted in any desired position by either 3/10" screws or else by soldering. Are available in .004 and .006 mfd. sizes. Tolerance of 10%. Shipping weight, 3 oz.

No.	Capacity	List Price	YOUR PRICE
No. 1242 Aerovox Mica By-Pass Condenser .004 mfd.			\$0.50
No. 1243 Aerovox Mica By-Pass Condenser .006 mfd.			\$0.55

YOUR PRICE 12 for \$2.55

RADIO TRADING COMPANY, 25 WEST BROADWAY, NEW YORK, N. Y.

## 8 Mfd. Filter Condenser Block



One of the best looking condenser blocks on the market. Consists of 6 sections distributed as follows: 2-2 mfd. sections at 600 volts, 2-1 mfd. sections at 600 volts and 2-1 mfd. section at 250 volts. Each section is plainly marked on the terminal strip as shown in the illustration

above. Will fulfill the requirements of all standard power packs for receivers and amplifiers. Put up in aluminum-plated metal shield case provided with convenient mounting bracket. When mounted properly the terminal lugs protrude through the sub-panel, thus conforming with modern standards of sub-panel wiring. Measures 4"x5"x2 1/2". Shipping weight, 4 lbs.

List Price \$5.00  
No. 1288 8 Mfd. Filter Condenser Block  
YOUR PRICE **\$1.60**



## Dubilier 5.1 Condenser Block

A handy condenser unit to have around for replacement or experimental work. Six high-grade condensers permanently impregnated and sealed in a weatherproof metal container. Has 2 and 1 mfd. @ 400 volts, 1 1/2 and 1/2 mfd. at 180 volts and 1/10 mfd. at 400 volts. Size of can is 5"x1 1/2"x1 1/2".

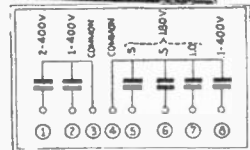
Shipping weight, 3 lbs.

List Price \$6.00

No. 1264 Dubilier 5.1 Condenser Block.

YOUR PRICE

**\$1.50**



## Stromberg Carlson 3.9 Mfd. Condenser

A 1000 volt filter condenser for replacement purposes in Brunswick, RCA and Victor Electrical combinations. Part No. SK1214 AQ. A fine condenser for all purposes. Comes in strong metal case. Shipping Weight, 2 lbs. Overall Size, 5x1 1/2x1 1/2 in.

No. 1738 Stromberg Carlson 3.9 mfd. Condenser.

YOUR PRICE **\$1.50**

## POLYMET 3 MF. FILTER CONDENSER

The working potential of this very small-size condenser is 400 volts. IT IS JUST THE CONDENSER FOR NOISE FILTERS SHUNTING LIGHT LINES OR ELECTRICAL APPARATUS.

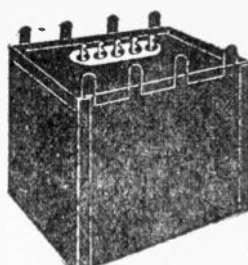


In some cases one condenser connected across the line, or instrument or from one side of the circuit to ground, will be sufficient. However, in most commercial filters manufactured for this purpose there are TWO CONDENSERS CONNECTED IN SERIES. THE CENTER TAP BEING GROUNDED AND THE TWO REMAINING LEADS CONNECTED TO THE LIGHT LINE OR THE INTERFERENCE-PRODUCING APPARATUS. Tinned metal case, two mounting brackets, lugs for soldered connections, fiber cover-plate. Dimensions, only 2-1/4 x 1 1/4 x 3/4 (all 1/4" on each side for brackets). Shipping weight, 2 lbs.

No. C-926 Polymet 3 Mf. Condenser.

List Price, \$2.75  
YOUR PRICE **\$1.20**

## Victor 10.75 Mfd. Replacement Condenser Block



A replacement condenser block for use in all Victor receivers. Total Capacitance 10.75 mfd. 600 volts. Terminal connections are as follows: No. 1—5 mfd.; No. 2—3 mfd.; No. 3—2.5 mfd.; No. 4—Common or Ground; No. 5—25 mfd.

This condenser bank is not only useful in service work for general replacement purposes but will be excellent in any circuit employing 45 tubes. Comes in metal container. Shipping weight, 6 lbs. Overall dimensions, 5 1/2 x 5 1/2 x 4 1/2".

List Price, \$8.00.

No. 1749 Victor Replacement Condenser Block.

YOUR PRICE **\$1.55**

## Zenith 10 1/4 Mfd. Replacement Condenser Block



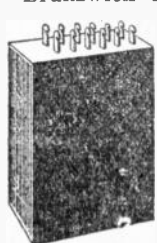
A high voltage filter condenser block totalling 10 1/4 mfd. 600 v. for use in Zenith sets or in any sets employing 45 tubes. Units are 4-4-2-25 mfd. An excellent piece of equipment made by the Potter Condenser Co. especially for Zenith. Shipping Weight, 5 lbs. Size, 6 1/2 x 4 1/2 x 2 1/2".

No. 1717 Zenith Replacement Condenser Block

YOUR PRICE

**\$2.65**

## Brunswick 6 Mf. Condenser Bank



For replacement purposes in Brunswick Models 14, 21 and 31 and in 318PU. Can also be used with any set or amplifier employing 45 output tubes. The capacitance values are as follows:

1—1 mfd. 600 volt; 1—1.25 mfd. 600 volt; 1—50 mfd. 600 volt; 1—1.5 mfd. 300 volt; 1—1 mfd. 300 volt; 1—25 mfd. 300 volt; 1—5 mfd. 200 volt.

These condensers are of the highest quality and were made expressly for the Brunswick company for use in the receivers named. Shipping Weight, 2 lbs. Overall dimensions 4 1/2 x 3 1/2 x 1 1/2 in.

No. 1739 Brunswick Condenser Bank.

YOUR PRICE **\$1.25**

## Polymet Moulded By-Pass Condensers



Extremely small, compact, yet highly efficient condensers excellently suited for radio and audio frequency by-passing, resistance or impedance coupling, tone control and a variety of other purposes.

These units are rated at 1500 volts and may therefore safely be employed in every conceivable radio circuit where the capacity requirements are low. Place one of these condensers in series with a variable resistor, and you have a combination across the secondary of the last A.F. transformer whereupon you have a smooth effective means of controlling the tone of any receiver from HIGH TREBLE to LOW BASS.

No.	Mfd.	YOUR PRICE	No.	Mfd.	YOUR PRICE
MC-1200	.00003	.18	MC-1212	.001	.20
MC-1201	.00004	.18	MC-1213	.0015	.20
MC-1202	.00005	.18	MC-1214	.002	.21
MC-1203	.00007	.18	MC-1215	.0025	.21
MC-1204	.0001	.18	MC-1216	.003	.25
MC-1205	.00015	.18	MC-1217	.004	.25
MC-1206	.0002	.18	MC-1218	.005	.33
MC-1207	.00025	.18	MC-1219	.006	.33
MC-1208	.0003	.18	MC-1220	.0075	.33
MC-1209	.0004	.18	MC-1221	.01	.45
MC-1210	.0005	.19	MC-1223	.015	.55
MC-1211	.0007	.19	MC-1225	.02	.68

## Peerless 7 Mfd. Replacement Block

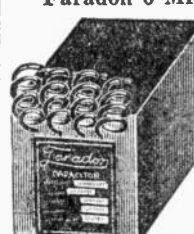


A condenser bank made by Sprague for use in Peerless receivers. May be used for replacement or in any receiver using 45 output tubes. Working voltage 500 volts. Coding is as follows: Red—2 mfd. 600 v., Blue—2 mfd. 400 v., White—High Voltage Common, Green—1 mfd. 300 v., Brown—1 mfd. 300 v., Yellow—5 mfd. 200 v., Orange—5 mfd. 200 v., Black—Low voltage common. Shipping Weight, 3 lbs. Overall Size, 5 1/2 x 2 1/2 x 2 1/2".

No. 1718 Peerless Replacement Condenser Block

YOUR PRICE **\$1.00**

## Faradon 6 Mfd. Condenser Block



This is Faradon Part No. 3687. Made by the Wireless Specialty Apparatus Co. This condenser has three units as follows:

Lead 1—1 mfd. 450 v. 2—2 mfd. 450 v. 3—3 mfd. 450 v. 4—Common.

May be used for replacement purposes in many receivers or for experimental work. An exceptionally fine condenser at a low price. Shipping weight, 1 lb. Overall Size 4 1/2 x 3 1/2 x 1 1/2 in. No. 3687 Faradon 6 mfd. Condenser Block.

YOUR PRICE **\$0.90**

## Franklin High Voltage Condensers



Excellent condensers for all types of power supply and receiver repair and construction work. These condensers are available in the sizes tabulated below.

No. 1743 Franklin Condenser, 1 mfd. 450 v.

Shipping Weight, 1 lb. Size 5 1/2 x 2 1/2 x 1 1/2 in.

YOUR PRICE **\$0.40**

No. 1744 Franklin Condenser, 2 mfd. 450 v.

Shipping Weight, 1 1/2 lb. Size 5 1/2 x 2 1/2 x 1 1/2 in.

YOUR PRICE **\$0.65**

No. 1745 Franklin Condenser 1/2 mfd. 1000 v.

Shipping Weight, 1/2 lb. Size 5 1/2 x 2 1/2 x 1 1/2 in.

YOUR PRICE **\$0.50**

No. 1746 Franklin Condenser, 1 mfd. 1000 v.

Shipping Weight, 1 lb. Size 5 1/2 x 2 1/2 x 1 1/2 in.

YOUR PRICE **\$0.75**

No. 1747 Franklin Condenser, 2 mfd. 1000 v.

Shipping Weight, 1 1/2 lb. Size 5 1/2 x 2 1/2 x 1 1/2 in.

YOUR PRICE **\$1.65**

## Fada 1 Mf. Condenser



Direct current working potential, 400 volts. May be used in most filter circuits. Convenient size for making up banks of several condensers to obtain higher capacity; or for connecting in series to use in high-voltage transmitter circuits or power amplifier panels. Metal case is aluminum-finished. Moisture proof seal. Not to be confused with ordinary 1.0 mf. condensers with a "test" potential of 400 volts (but a "working" potential of only about 200 volts). Flat, small-size, and may be used in most by-pass positions.

Use this unit as the coupling condenser when connecting additional reproducers of the magnetic type to radio sets designed to use a dynamic reproducer. Dimensions, 2 1/2 x 1 1/2 in. Shipping weight, 2 lbs.

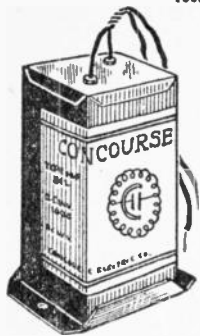
List Price, \$2.00.

No. 1701 Fada 1 Mf. Condenser.

YOUR PRICE **\$0.50**



## Concourse "250" Filter Condensers 1000 Volts



Specially designed, surge-proof, filter condensers, for low-power transmitters, 250 receivers, amplifiers, public-address systems and all other electrical apparatus employing high-voltage power tubes. Impregnated in a special, high melting-point compound which protects the unit from surrounding heat and moisture. Put up in metal shield cans with suitable mounting brackets. Measures 2-1/16" x 1 1/2" x 2-1/16". Shipping weight, 2 lbs.

REGULAR STOCK SIZES			
No.	Capacity in Mfd.	List Price	YOUR PRICE
1259	0.5	1.50	<b>\$0.68</b>
1263	1.0	2.25	<b>\$1.05</b>
1261	2.0	4.15	<b>\$1.90</b>
1262	4.0	8.00	<b>\$3.60</b>

## Polymet Waxite Condensers Non-Inductive Cartridge Type



A genuine Polymet product. Constructed of tin-foil and high quality 1 in. paper. Impregnated in special wax compound, hermetically sealed in pitch and finally covered with a special fiber jacket. Guaranteed against breakdown or inductive disturbances. These condenser units are NOT SURPLUS MERCHANDISE. Will easily fit under all sub-chassis. Provided with flexible pigtail leads for convenient connections. Shipping weight, 4 oz.

REGULAR STOCK SIZES			
No.	Capacity in Mfd.	D.C.W.V.	YOUR PRICE
1200	.05 mfd.	200 volt	<b>\$0.10</b>
1201	.1	"	<b>\$0.10</b>
1202	.25	"	<b>\$0.12</b>
1203	.5	"	<b>\$0.15</b>
1204	1.	"	<b>\$0.20</b>
1205	.006	400 volt	<b>\$0.10</b>
1206	.01	"	<b>\$0.12</b>
1207	.05	"	<b>\$0.12</b>
1208	.1	"	<b>\$0.14</b>
1209	.25	"	<b>\$0.15</b>
1210	.01	600 volt	<b>\$0.13</b>
1211	.1	"	<b>\$0.13</b>
1212	.25	"	<b>\$0.18</b>

## Polymet Grid Condensers



Complete with Grid Leak Clips Bakelite moulded mica condensers with convenient grid leak clips. Are equipped with soldering lugs and insulated holes for sub panel mounting. Terminal mounting holes 1-13/16" centers. Shipping wt., 4 oz.

No.	Capacity in Mfd.	D.C.W.V.	YOUR PRICE
MC-1240	.00015 mfd.		<b>\$0.21</b>
MC-1241	.00025 mfd.		
MC-1242	.0005 mfd.		

## Polymet Phone Plugs



No.	Type	List Price	YOUR PRICE
PP-1	Bakelite Plug	\$0.50	<b>\$0.27</b>
PP-2	Composition Plug	.35	<b>\$0.22</b>

## Polymet Special Service Men's Kit 25 Ass'd. Unleaded Quality Condensers



Take advantage of the present demand for repair of old receivers. Build strongly for the future, and increase your business by giving GUARANTEED REPAIRS. This you can do safely by using radio's finest condenser units—POLYMET CONDENSERS—which we guarantee to you.

The kit consists of the following—25 condensers, all useful sizes, each properly impregnated, sealed, and provided with heavy, rubber-insulated leads. Neatly boxed in factory cartons. Shipping weight, 8 lbs

CONTENTS OF KIT			
No.	Capacity in Mfd.	D.C.W.V.	YOUR PRICE
2	0.5	200	
2	1.0	200	
2	1.0	200	
2	1.0	200	
1	2.0	200	
1	2.0	200	
1	0.5	300	
1	1.0	300	
1	1.0	300	
2	1.0	400	
2	1.0	400	
2	1.0	400	
2	1.0	400	
1	0.5	600	
1	1.0	600	
2	1.0	600	
2	1.0	600	

\* Note: These units have the same capacity but differ in size.

List Price \$20.00  
No. 1275 Polymet Special Service Men's Kit  
**YOUR PRICE \$9.95**

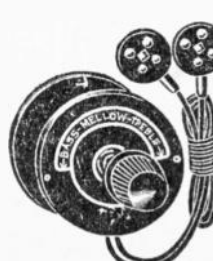
## Concourse By-Pass Condensers Fully Guaranteed



Accurately calibrated paper by-pass condensers which, because of their HIGH D.C. WORKING VOLTAGE may be employed in any by-pass radio circuit whatsoever including those of the PEN-TODE and HI-MU TUBES. Are scientifically impregnated and sealed in a metal shield container which measures 1 1/2" x 2 1/2" x 1 1/2" and which is provided with suitable mounting facilities. Connections are made by means of two soldering lugs. Light weight, compact, efficient. Shipping weight, 4 oz.

REGULAR STOCK SIZES			
No.	Capacity in Mfd.	D.C.W.V.	YOUR PRICE
1201	.1	200	<b>\$0.45</b>
1221	Double .1	200	<b>\$0.35</b>
1223	.25	200	<b>\$0.50</b>
1224	.5	200	<b>\$0.30</b>
1225	1.0	200	<b>\$0.35</b>
1226	Double .1	A.C. W.V. 1000	<b>\$0.68</b>

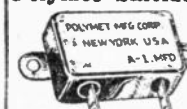
## Hamilton Tone Control For Panel Mounting



Here is a tone control that elevates all old style receivers to the same class with modern ones. It is a unit of proven merit and design and will smoothly vary the tone of any receiver from high TREBLE to low BASS, with one turn of the knob. This control is of the continuously variable type, easily installed by merely inserting the provided adapters under the power tube or tubes. Supplied with regular or extra long shank to mount on every type and thickness of panel. Specify when ordering. Shipping wt., 1 lb.

No.	Type	List Price	YOUR PRICE
No. 2242	Hamilton Tone Control	\$2.50	<b>\$1.40</b>

## Polymet Shielded By-Pass Condensers



These are extremely fine by-pass condensers for replacements. Identical with those incorporated in many well-known receivers. Voltage ratings are continuous D.C. working voltages, listed strictly in accordance with R.M.A. and N.E.M.A. standards. These condensers are standard items with us. THEY ARE NOT SURPLUS MERCHANDISE. We guarantee each and every one of them to be perfect in every respect. Put up in metal shield cans and provided with insulated terminal lugs and mounting brackets.

REGULAR STOCK SIZES			
No.	Capacity in Mfd.	Size	YOUR PRICE
1250	0.1	2 1/2" x 1 1/2" x 3/4"	<b>\$0.24</b>
1251	0.25	"	<b>\$0.27</b>
1252	0.5	"	<b>\$0.30</b>
1253	1.0	2 3/4" x 1 1/2" x 3/4"	<b>\$0.39</b>
1254	0.1	Working Voltage 400 volts D.C.	<b>\$0.32</b>
1255	0.25	2 1/2" x 1 1/2" x 3/4"	<b>\$0.32</b>
1256	0.5	2 3/4" x 1 1/2" x 3/4"	<b>\$0.41</b>
1257	0.1	Working Voltage 600 volts D.C.	<b>\$0.35</b>
1258	0.25	2 3/4" x 1 1/2" x 3/4"	<b>\$0.42</b>

## Polymet Midget Mica Condensers Moulded Bakelite-Universal Mounting



Polymet foil and mica condensers represent the best in moulded fixed condensers, entirely sealed in Bakelite, protected from all atmospheric conditions, and mechanically strong. Two insulated mounting holes permit direct mounting to a metal pane or chassis. Tinned soldering lugs are moulded in, giving positive and permanent connections. Each condenser is tested for accuracy and given a breakdown test at 1000 volts D.C. Measure 1 1/4" long by 2/32" wide. Shipping weight, 4 oz.

REGULAR STOCK SIZES			
No.	Capacity in Mfd.	List Price	YOUR PRICE
1227	.0001	\$0.30	<b>\$0.10</b>
1228	.00015	.30	<b>\$0.10</b>
1229	.0002	.30	<b>\$0.10</b>
1230	.00025	.30	<b>\$0.10</b>
1231	.0003	.30	<b>\$0.10</b>
1232	.0004	.30	<b>\$0.10</b>
1233	.0005	.35	<b>\$0.11</b>
1234	.001	.40	<b>\$0.10</b>
1235	.0015	.45	<b>\$0.15</b>
1236	.002	.45	<b>\$0.15</b>
1237	.0025	.45	<b>\$0.15</b>
1238	.003	.60	<b>\$0.18</b>
1239	.004	.60	<b>\$0.20</b>
1240	.005	.60	<b>\$0.22</b>
1241	.006	.75	<b>\$0.25</b>

## I.C.A. Selectone



The I.C.A. Selectone is a portable tone control of superior quality which enables one to choose and regulate the tone quality of a receiver desired most. By a turn of the knob you may emphasize either the high TREBLE of the violin or the low BASS of the drum. Choose that tone which is most agreeable to your ear.

## REMEDIES "TINNY" SPEAKERS

Selectone will take the "tin" out of any reproducer, by simply passing the frequencies which cause it. It will also match the characteristics of a receiver and speaker to the acoustics of the room in which they are used. The Selectone helps materially in reducing crackling noises and other interference due to electrical apparatus in the vicinity.

The Selectone is finished in rich brown with a beautiful knob to match. The housing is made of cast metal and is properly weighted. Can be attached by any one in a few minutes without the use of tools. Shipping weight, 2 lbs.

No.	Type	List Price	YOUR PRICE
No. 2241	I.C.A. Table Model Selectone	\$2.50	<b>\$1.20</b>

## Polymet Auto-Noise Eliminators



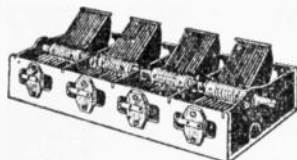
Specially designed condensers for use on automobiles carrying radios. Their function is to absorb the excess energy which causes sparking at the interrupter, and thus static in the radio. In use they are "shunted" across the contact breaker. Made to withstand all conditions of temperature and vibrations. Available in two sizes. Shipping weight, 4 lb.

No.	Type	List Price	YOUR PRICE
No. 3911	Auto Condenser 0.5 Mfd; size 2 1/2" x 1 1/2" Diam.	\$0.40	<b>\$0.40</b>
No. 3912	Auto Condenser 1.0 Mfd; size 3 1/2" x 1 1/2" Diam.	\$0.50	<b>\$0.50</b>





## Stromberg Carlson Four Gang .00035 Mfd. S.L.F. Condenser



A sturdy condenser unit for use with all circuits requiring a four gang tuning condenser. Straight Line Frequency Characteristics for ease in tuning. Shaft  $\frac{1}{8}$  in. in diameter for strength. These

condensers are made from the finest brass stock with positive contact adjustable bearings. One of the finest condensers made. Equipped with bakelite pads for connecting trimmer condensers. Perfectly aligned throughout entire tuning range. The very finest condenser made. Shipping Weight, 3 lbs. Overall Size,  $7\frac{1}{2} \times 2\frac{1}{2} \times 1\frac{1}{2}$  in.

No. 1752 Stromberg Carlson Four Gang Condenser

YOUR PRICE **\$1.50**

## Dumont "Elkon" Replacement Unit



An electrolytic condenser unit for replacement in Elkon and Knapp "A" Eliminators. Capacitance 2000 mfd. Voltage 8-10. Correct size for replacement in eliminators named. Measures  $6\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{2}$  square. Shipping Weight, 3 lbs.

List Price, \$4.50

No. 1842 Dumont "Elkon" Replacement Unit

YOUR PRICE **\$1.70**

## Dumont Hum Eliminator



This is a 2000 mfd. electrolytic condenser for use with "A" eliminators or across the field windings of dynamic speakers operating at 6 to 12 volts. Eliminates hum in those dynamic speakers having fields energized by rectified A.C. at low voltage. It is innumerable uses. Shipping weight, 1 lb.

List Price \$4.50

No. 1681 Dumont Hum Eliminator

YOUR PRICE **\$1.75**

## Dumont "Kuprox" Replacement Unit



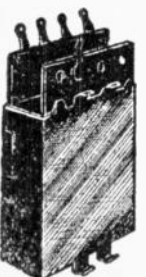
An Electrolytic Condenser unit for replacement in Kuprox "A" eliminators. A 2,000 mfd. unit for use at 6 to 12 volts. Correct size for replacement purposes in Kuprox eliminators. Shipping weight, 4 lbs.

List Price \$4.50

No. 1841 Dumont "Kuprox" Replacement Unit

YOUR PRICE **\$1.75**

## RCA Multiple By-Pass Condenser



Three .1 mfd. condensers and one .5 mfd. condenser mounted in a single unit for by-passing R.F. or A.F. circuits. All units tested at 450 vol. An extremely useful item for pair or construction work. Equipped with soldering lugs. Shipping weight, 3 oz.

No. 1714 RCA Multiple By-Pass Condenser.

YOUR PRICE **\$0.25**

## RCA Neutralizing Condenser

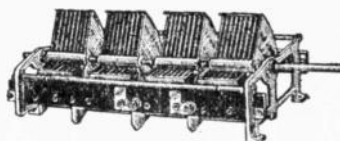


A screw adjustment, bakelite insulated condenser suitable for neutralization, trimming or R.F. compensating in all receivers. Used in Radiolas 17, 18 and 33. Shipping weight,  $\frac{1}{2}$  lb.

No. 1712 RCA Neutralizing Condenser

YOUR PRICE **\$0.30**

## "Zenith" Four Gang Die Cast Condenser



.00035 mfd. units are pre-etched. Built with large space between elements and with electrostatic shielding. Mechanical construction is such that the condenser plates cannot possibly get out of alignment. Each plate is made a full  $\frac{1}{16}$ th of an inch thick to avoid the warping found in instruments of less sturdy nature. Shipping weight, 8 lbs.

No. 1750 "Zenith" Four Gang Die Cast Condenser

YOUR PRICE **\$1.75**

## Hammarlund Compensating Condenser



Size,  $\frac{1}{2} \times 1\frac{1}{2} \times \frac{1}{2}$  in.

AN IDEAL ANTENNA-COUPLING CONDENSER FOR SHORT-WAVE RECEPTION

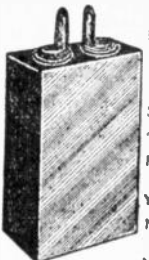
Makes the receiver highly selective and sensitive, bringing in DX STATIONS never before received. Adjustment of center screw provides smooth noise-free variation of capacity. May be attached directly to binding post of socket or condenser.

List Price \$.50

No. 1742 Hammarlund Compensating Condensers.

YOUR PRICE **\$0.18**

## Grebe Replacement Condensers



These Grebe condensers are used in surplus power supply units and made into this form, for general replacement purposes. Prices quoted for uncased condensers. Rated at 300 v. D.C. or 200 A.C. Shipping weight,  $\frac{1}{2}$  lb.

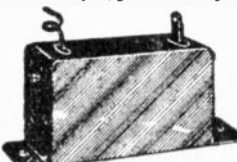
No. 1715 Grebe Condenser—1 mfd.

YOUR PRICE **\$0.22**

No. 1716 Grebe Condenser— $\frac{1}{2}$  mfd.

YOUR PRICE **\$0.16**

## Utility $\frac{1}{2}$ Mfd. By-Pass Condenser

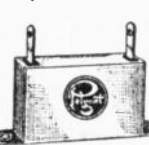


These by-pass condensers are in cases uniform with the Dubilier Model 907 and are equipped with one soldering lug and one flexible lead. They are recommended for all round usefulness in the service shop or laboratory. Shipping weight, 4 oz.

No. 1714 Utility .5 mfd. By-Pass Condenser

YOUR PRICE **\$0.25**

## Polymet Shielded By-Pass Condensers



200 Working Voltage  
The well known Polymet non-inductive by-pass condensers at a considerable saving over list prices. 100 working voltage, 2 volts. Measures  $2\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{2}$  in. Shipping weight  $\frac{1}{2}$  lb.

No. C874 .025 mfd.

List Price 95c

YOUR PRICE

**\$0.35**

No. C877 0.5 mfd.

List Price \$1.00

YOUR PRICE

**\$0.35**

No. C881 1.0 mfd.

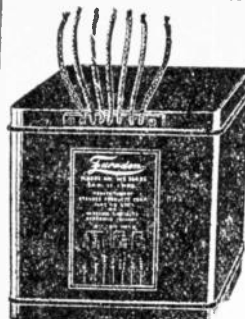
List Price \$1.25

YOUR PRICE

**\$0.45**

## Faradon "250" Condenser Bank

11.1 Mfd.—1000 Volts



A high voltage filter condenser, bank suitable for power packs for "250" receivers, amplifiers or low power transmitters. Made of the finest material available and guaranteed to withstand the specified voltages. Consists of a 3 mfd. section at 1000 volts used as a first condenser immediately following the rectifier; a 4 mfd. at 600 volts as the second condenser following the choke and a 0.1 mfd. at 400 volts and 4 mfd. at 160 volts, for by-passing.

Where it is desired to employ two filter chokes, we recommend

the use of two of these units. This arrangement would effectively eliminate the slightest trace of hum and insure smooth, unflinching current for the plate supply. Constructed of metal foil and paper which are "reverse-wound" to prevent induction effects and are housed in a metal shield can with black enamel finish. Distribution of the various condenser units is clearly shown on the label of the can. Measures  $6\frac{1}{2} \times 3\frac{1}{2} \times 6\frac{1}{2}$  in. Shipping weight, 5 lbs.

List Price \$8.00

No. 1263 Faradon "250" Condenser Bank

YOUR PRICE **\$2.25**

## "Trutest" Pigtail Condensers

0.1 and 0.03 mfd.



Accurately calibrated, hermetically sealed cartridge condensers with pure, surge-proof, high quality mica dielectric. 1.51 as by-pass and low voltage filter condensers. Special timed pigtail leads protruding from either end take to solder very easily. Maximum D.C. working voltage 300 volts. These units are recommended for R.F. and A.F. filter systems, resistor shunts, tone controls and for all other circuits where high grade condensers are essential. Measure  $2\frac{1}{2} \times 1\frac{1}{2} \times 1\frac{1}{2}$  in. diam. are available in 0.1 and 0.03 mfd. Specify which when ordering. Shipping weight, 4 oz.

List Price \$0.30

No. 1213 0.1 mfd. "Trutest" Pigtail Condensers

YOUR PRICE **\$0.12**

No. 1214 0.03 "Trutest" Pigtail Condensers

YOUR PRICE **\$0.11**

12 for \$1.28

## Dubilier Type 656 .1 Mfd. Condensers



These Dubilier By-pass Condensers are rated at 300 volts. They may be used as coupling condensers in Resistance Coupled amplifiers or in by-passing R.F. circuits. Shipping weight,  $\frac{1}{2}$  lb.

No. 1724 Dubilier Type 656 .1 Mfd. Condensers

YOUR PRICE **\$0.30**

## Micamold Midget Mica Condensers



Moulded Bakelite Grid condensers for use in all types of radio receivers. Made from the finest materials by Micamold. Smallest molded condenser made. Convenient solder lugs. Shipping Weight, 1 oz.

No. 1770 Micamold .0001 Mica Condenser

YOUR PRICE **\$0.09**

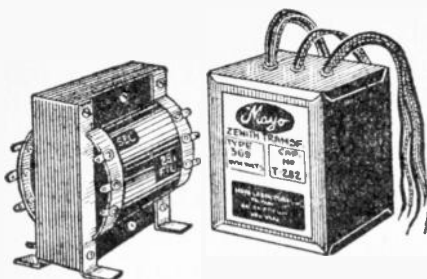
No. 1771 Micamold .0005 Mica Condenser

YOUR PRICE **\$0.09**

No. 1772 Micamold .00025 Mica Condenser

YOUR PRICE **\$0.09**

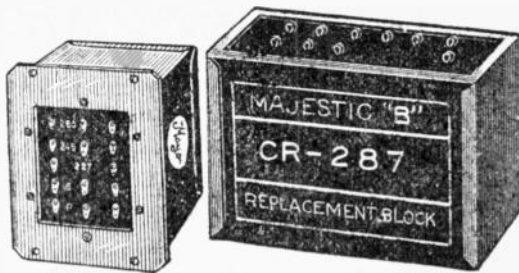
# "MAYO" Replacement Condenser Blocks and Power Transformers



Guaranteed Replacement Units for Every Receiver Ever Manufactured

We guarantee these blocks to be identical to the filter blocks used in the original radio sets or eliminators. These filter units are made by one of the largest Eastern condenser manufacturing companies and are warranted by them and by us to be perfect in every respect. They have a safety factor of approximately 25% which insures them against breakdown under any condition of voltage surges.

There may be cheaper filter blocks on the market, but having had experience with these, we no longer handle them. Filter condenser units are important factors in all radio sets. A punctured condenser is a practical short circuit upon the rectifying tube and unless



immediately detected and remedied, will ruin the rectifying tube or tubes, as the case may be, and probably the high voltage winding of the power transformer too. Hence we need not stress the fact that the quality of filter units is of paramount importance to the well being and normal operation of all receivers. We can furnish any replacement filter condenser block not listed here and invite you

to write for prices on same, as it is impossible to list all of them. Shipping weights vary from 5 to 10 lbs. Use catalog number and name of set when ordering. All replacement condenser blocks and transformers listed below MAY BE HAD FOR 25 CENTS AT AN ADDITIONAL COST OF 20% OF YOUR PRICE.

## SPECIFICATIONS

CONDENSERS						TRANS.			CONDENSERS						TRANS.		
CAT. NO.	SET	LDS.	SIZE	CAP. PRICE	LIST YOUR PRICE	CAT. NO.	LIST PRICE	YOUR PRICE	CAT. NO.	SET	LDS.	SIZE	CAP. PRICE	LIST YOUR PRICE	CAT. NO.	LIST PRICE	YOUR PRICE
M600	A.C. DAYTON CO.	6T	4x4x4 1/2	7.1	\$14.00 \$4.30	T325	\$10.00	\$4.50	M641	C2-C4	10L	2 1/2 x 3 1/2 x 4 1/2	8.1	6.50 2.33	T322	9.00	4.05
M601	A.C. 63	6T	3 1/2 x 4 1/2	5.2	10.50 4.73	T325	10.00	4.50	M642	930	8L	4 1/2 x 4 1/2	10.1	12.00 5.40	T340	16.00	7.20
M602	ACME ELEC. CO. AC7	6L	2 1/2 x 3 1/2 x 4 1/2	10.5	10.00 4.50	T319	7.50	3.38	M643	C6	6L	2 1/2 x 3 1/2 x 4 1/2	6.1	4.50 2.03	T335	12.50	5.63
M779	A-8	6L	2 1/2 x 3 1/2 x 3	5.2	5.20 2.34	T321	6.00	2.70	M644	901	6T	3 1/2 x 5 1/2	11.75	15.00 6.75	T337	14.00	6.20
M603	F Type	6L	3 1/2 x 3 1/2	10.	10.00 4.50	M645	950	8L	4 1/2 x 4 1/2	10.1	14.00 6.20	T304	16.00	7.20			
M604	1 A-B Elim.	6L	3 1/2 x 5	9.	9.00 4.05	M646	S G 8	7T	2 1/2 x 4 1/2	7.9	11.00 4.95						
	36					M647		4T	5 1/2 x 2 1/2 x 3 1/2	7.	11.00 4.95						
	D (Lyric)					M648		5T	2 1/2 x 5 1/2 x 3 1/2	7.	12.50 5.63						
	AMRAD A.C. 7					M649		8T	3 1/2 x 5 1/2	7.9	11.00 4.95						
	81	and	BELCANTO	SERIES		M650		6T	3 1/2 x 6 1/2 x 2 1/2	8.	2.50 1.13	T331	13.50	6.08			
M605	APEX 36 (25 Cy.)	6L	2 1/2 x 4 1/2	7.5	9.50 4.28	E-8	CROSLEY 303,335,345	1T				T331	13.50	6.08			
M606	36 (60 " )	8T	2 1/2 x 2 1/2 x 4 1/2	7.	9.00 4.05	E-24	82S, 31S, 40S, 41S, 42S	3T				T331	13.50	6.08			
M607	37	6L	2 1/2 x 4 1/2	5.5	9.00 4.05	T322	9.00	4.05				T331	13.50	6.08			
M608	41	6L	3 1/2 x 2 1/2	4.5	10.00 4.50	T331	13.50	6.08									
M609	46	5L		5.6	9.00 4.05	T331	13.50	6.08									
M610	ARBORPHONE 46	5L	2 1/2 x 3 1/2 x 3 1/2	8.	10.00 4.50	T322	9.00	4.05									
	56																
M611	ARGUS ELEC. 191	5L	3 1/2 x 4 1/2 x 4 1/2	6.	12.50 5.63												
M612	210 Cont. Choke	6L	3 1/2 x 5 1/2 x 4 1/2	14.	12.00 5.10	T322	9.00	4.05									
M613	37-38 Inc. Chokes	6L	8 1/2 x 4 1/2	5.	8.00 3.60	T305	6.00	2.70									
	40-42-52 Pack-Pr		Flts orig. cover		20.00 9.00												
M614	55-56C Trans-Cond-Choke					T331	13.50	6.08									
	40-42-43-44-52					T322	9.00	4.05									
M615	46	7L	3 1/2 x 2 1/2 x 4 1/2	7.	10.00 4.50												
M616	37 Cond. Only	6L		5.	4.00 1.80												
M617	40	7L		5.	4.00 1.80												
M618	By-Pass	3L	2 1/2 x 3 1/2	3.	1.75 .78												
M619	By-Pass	2L	1 1/2 x 3 1/2	2.	1.50 .58												
M620	41 DC Comp. Pack			7.	11.00 4.95												
M621	AUDIOLA	4L	3 1/2 x 3 1/2	9.5	10.00 4.50												
M622	BALKEIT D	4L	1 1/2 x 3 1/2	6.5	9.00 4.05												
M623	W	4L		6.5	9.00 4.05												
M624	C	5T	2 1/2 x 4 1/2	7.	8.00 3.60	T331	13.50	6.08									
M625	F	4T	5 1/2 x 3 1/2	20.	12.00 5.40												
M626	BOSCH	8L	5 1/2 x 4 1/2	8.1	15.00 6.75	T322	9.00	4.05									
M627	Little 6	5L	2 1/2 x 5 1/2	14.	10.00 4.50	T300	14.00	6.20									
M628	BOSCH 28 Cond. Choke	7L	3 1/2 x 4 1/2	6.2	9.00 4.05	T301	20.00	9.00									
M629	29-825 PACK	6L	3 1/2 x 4 1/2	7.2	10.00 4.50	T319	7.50	3.38									
M630	501-502-503	5L	2 1/2 x 4 1/2 x 5 1/2	9.	8.50 3.83	T331	13.50	6.08									
M631	48	6T	4 1/2 x 6 1/2	9.2	9.00 4.05												
A100	BRAACH A ELIM.	3L	1 1/2 x 5 1/2	6000	7.00 3.10												
M632	BRANDES B-10	11L	1 1/2 x 4 1/2 x 4 1/2	3.7	8.00 3.60												
M633	B-15, 16	7L		5.1	7.00 3.10												
M634	BREMER-TULLY	6L	3 1/2 x 4 1/2 x 5 1/2	7.	10.00 4.50												
M635	8-20A, 8-21A	10L	3 1/2 x 5 1/2 x 5 1/2	12.	11.00 4.95	T302	12.00	5.40									
M636	6-40	9L	2 1/2 x 5 1/2	14.5	11.00 4.95	T325	10.00	4.50									
	7-70, 7-71																
	BROWNING-DRAKE					T331	13.50	6.08									
	MB-30					T331	13.50	6.08									
	69-70-71					T325	10.00	4.50									
	BRUNSWICK 5-KRO					T325	10.00	4.50									
	3-KRO, R1, 5-KRO					T325	10.00	4.50									
	6-KR					T331	13.50	6.08									
	81-82 (Panatrope)					T331	13.50	6.08									
	S-31, 5, 14, E21.					T331	13.50	6.08									
	B.T.S., 81S, E2, 15					T331	13.50	6.08									
	22																
M637	BUCKINGHAM	6L	1 1/2 x 2 1/2 x 5 1/2	8.	10.00 4.50	T303	14.00	6.20									
E-16	Electrolytic	2T		16.	4.25 1.91												
M780		7T	2 1/2 x 4 1/2	6.9	7.50 3.38	T331	13.50	6.08									
	BUSH & LANE 12SG																
M781	CAPITOL 9 Tube	4L	2 1/2 x 4 1/2	9.	9.20 4.14												
M782	CLEARSTONE	6L	1 1/2 x 5 1/2	13.	9.00 4.05												
M638	COLONIAL	3L	5 1/2 x 2 1/2 x 4 1/2	16.	20.00 9.00	T325	10.00	4.50									
E-24	31	3T		24.	5.50 2.48	T331	13.50	6.08									
E-24	32	3T		24.	5.50 2.48												
M783	32 By-Pass	4L	2 1/2 x 1 1/2	55	2.20 .99												
M784	32	4L		7.	1.60 .72												
E-16	33-34-35	2T	1 1/2 x 4 1/2	16.	4.25 1.91	T331	13.50	6.08									
M639	33-34-35	9L	3 1/2 x 6 1/2	7.2	8.50 3.83	T322	9.00	4.05									
	33-34-35	9L	2 1/2 x 3 1/2 x 4 1/2	8.	8.00 3.60												
	33-34-35																



# Replacement Condenser Blocks and Transformers (Con'd.)

CONDENSERS					TRANS.					CONDENSERS					TRANS.				
CAT. NO.	SET	LDS.	SIZE	LIST YOUR CAP. PRICE PRICE	CAT. NO.	LIST YOUR PRICE	CAT. NO.	SET	LDS.	SIZE	LIST YOUR CAP. PRICE PRICE	CAT. NO.	LIST YOUR PRICE	CAT. NO.	LIST YOUR PRICE	CAT. NO.	LIST YOUR PRICE	CAT. NO.	LIST YOUR PRICE
M686	GAROD EA	2L	4x1x5	4. 8.00 3.60	T339	13.50 6.00	M727	64-4 Mid. Rep. Unit	2L	1x1x5	4. 7.75 3.45	T339	13.50 6.00	M728	64-4 B C 850	2L	1x1x5	T308	24.00 10.80
M687	GENERAL MOTORS	5L	5x1x5	6. 10.00 4.50	T331	13.50 6.00	M729	30 (3 used)	2T	1x1x5	2. 3.50 1.62	T331	13.50 6.00	M730	30 (2 " )	2T	1x1x5		
	5077-5080				T325	10.00 4.50	M731	20	7T	4x3x5	9. 13.50 6.00			M732	SENTINEL B&C ELIM	8L	2x3x5		
	Model A				T325	10.00 4.50	M733	SILVER-MARSHALL	6L	7x3x5	9. 12.50 5.63			M734	SILVER-MARSHALL	6L	7x3x5		
M688	ABC 135	5L	2 1/2 x 1 1/2 x 5 1/2	15. 15.00 6.75			M735	SILVER-MARSHALL	6L	4x3x5	10. 16.00 7.20			M736		8T	4x3x5		
M689	GREEN-AC	6L	3x4x5	6000 7.50 3.38			M737		8T	4x3x5	7.5 12.00 5.40			M738		9L	4x3x5		
A103	GREEN-BROWN A	10L	4x3x5	13. 8.00 3.60			M739		8L	3x5x4	11. 16.00 7.20			M740	33A-34A-35A	4L	4x3x5		
M690	HIGH-POWER B	10L	4x3x5	10.7 8.50 3.83										E-16	SONORA B30-31	2T	16. 4.25 1.92	T331	13.50 6.00
M691	B SUPER POWER	10L	4x3x5	15. 10.00 4.50										M741	SPARTAN AC-5	5L	2x4x5	T309	9.00 4.05
M796	HAMMARLUND	8L	4x2x5	15. 10.00 4.50										M742	AC-7, 62, 63	6L	2x4x5	T310	14.00 6.20
	HI-QSO													M743	109	6L	7x3x5	T311	18.00 8.10
	HOWARD S G A													M744	301	3L	2x3x5	T312	18.00 8.10
	8 Green-Diamond													E-24	931	3L	2x3x5	T313	13.50 6.00
	KELLOGG 523-526													M745	69-79A (60 Cycle)	7L	2x3x5	T314	10.50 4.73
	KENNEDY-COLIN B.	7L	3x4x5	6.8 12.80 5.76										M746	SPITFIRE-ABBEY	8L	2x3x5		
M693		6T	2 1/2 x 1 1/2 x 2	2. 4.00 1.80										M747	M-5	6L	3x4x5		
M694		4L	5x1x5	10. 10.00 4.50										M748	STEINITE 50	6L	2x3x5	T322	9.00 4.05
M695		4L	3 1/2 x 2 x 4	12. 12.00 5.22										M749	40A-45-60	6T	2x4x5	T360	18.00 8.10
M696		3L		12. 12.00 5.40										M750	70A	6T	2x4x5	T361	10.00 4.50
E-24	20	3T		24. 5.50 2.48										M751	291-292-293	6L	2x4x5	T362	13.50 6.10
														M752	261	4L	2x4x5	T363	10.00 4.50
M699	KING Model J	7T	2 1/2 x 1 1/2 x 4 1/2	13. 9.40 4.23										M753	40C	4L	2x4x5	T364	14.00 6.20
M698	KODEL B-114	11L	2x4x5	13. 9.20 4.11										M754	12	3L	2x3x5		
A104	A-Single	2L	1x4x5	2000 3.00 1.35										M755	58	7L	2x3x5		
A105	A-2 in 1 Comb.	4L	3x4x5	4000 5.00 2.25										M756	STERLING A COND.	5L	3x4x5		
A106	A-3 in 1 Comb.	6L		6000 7.00 3.10										A109	STEWARD A COND.		STEWARD-WARNER		
M644	KOLSTER 6H	See	Columbia 901											M757	630 Sterling	4T	2x3x5	T399	10.00 4.50
M700	K20-22-42	9L	2 1/2 x 3 1/2 x 4 1/2	8. 6.00 2.70										M758	171-1 Tube	4L	2x3x5	T365	13.50 6.08
M701	K21-K23	10L		8.1 6.00 2.70														T331	13.50 6.08
M702	KOLSTER K-43	8T	1 1/4 x 4 x 5	5.1 6.00 2.70														T331	13.50 6.08
M703	K-24	7L	3x5x6	11.1 12.00 5.40														T331	13.50 6.08
M704	K-45	4T	3 1/2 x 4 x 4	4.1 7.50 3.38														T331	13.50 6.08
M705																		T331	13.50 6.08
	K-44																	T331	13.50 6.08
A167	MAJESTIC A COND.	4L	3x3x5	6000 6.50 2.93														T331	13.50 6.08
M706	Standard B Master B	10T	2x3x5	6.00 2.70														T331	13.50 6.08
M707	Special Master B	11T	2x3x5	6.50 2.93														T331	13.50 6.08
M708	70-71-72	5L	2 1/2 x 4 x 9	8. 8.00 3.60														T331	13.50 6.08
M709	80-81-82	6L		9. 8.00 3.60														T331	13.50 6.08
M710	90-91-92 Inc. Chk.	7L		9.00 4.05														T331	13.50 6.08
M711	90B	5L	2 1/2 x 4 x 6 1/2	7. 8.00 3.60														T331	13.50 6.08
M712	70-71-72, 25 cy.	6L	2 1/2 x 4 x 9	13. 12.50 5.63														T331	13.50 6.08
	MELROSE (See Apex)																	T331	13.50 6.08
M713	MOHAWK AC27 to 28	7L	1x5x5	7. 7.00 3.10														T331	13.50 6.08
M714	225 type pack	9L	2 1/2 x 4 x 5 1/2	7. 7.50 3.38														T331	13.50 6.08
M715	PEERLESS 65	7T	4x2x5	11.1 9.75 4.39														T331	13.50 6.08
M716	PHILCO 77	10T	2 1/2 x 4 x 5	8.4 10.20 4.59														T331	13.50 6.08
M717	511-12-13-14 etc.	8T	2x3x5	8.5 7.60 3.42														T331	13.50 6.08
M718	65	6T	4x3x5	9.15 9.00 4.05														T331	13.50 6.08
M719	ABC B Cond.	8T	2x3x5	9.1 8.10 3.65														T331	13.50 6.08
M720	PIERCE-ARROW, for	6L	2 1/2 x 4 x 5 1/2	10. 8.50 3.83														T331	13.50 6.08
M721	226-171	6T	4x3x5	9. 10.00 4.50														T331	13.50 6.08
M722	POWERIZER 210 PK.	7T	2 1/2 x 4 x 5 1/2	14. 9.50 4.28														T331	13.50 6.08
M723	R.C.A. 17	5T	2 1/2 x 4 x 3 1/2	2.5 4.00 1.80														T331	13.50 6.08
M724	18-31-51 Inc. Chk.	6T	2 1/2 x 4 x 5	8. 8.00 3.60														T331	13.50 6.08
M725	28	8T	3x4x5	9. 7.50 3.38														T331	13.50 6.08
M726	41	8T	3x4x5	9. 7.50 3.38														T331	13.50 6.08
M727	46 Inc. Choke	9T	2 1/2 x 4 x 5 1/2	7. 7.50 3.38														T331	13.50 6.08
M728	60	9T	2 1/2 x 4 x 5 1/2	8. 8.00 3.60														T331	13.50 6.08
M729	20 A	10T	1 1/4 x 4 x 5	15. 9.50 4.28														T331	13.50 6.08
M730	30 A	4T	2 1/2 x 4 x 5	12. 12.00 5.40														T331	13.50 6.08
M731	104 (Speaker)	2L	4 1/2 x 1 1/2 x 5	4. 5.00 2.25														T331	13.50 6.08

## AKRA-OHM WIRE-WOUND PRECISION RESISTORS

These wire-wound resistors are especially designed for heavy duty work and are ideal for employment in power packs, amplifiers, and all other high grade electrical apparatus where high current is necessary in a small, accurately calibrated wire wound resistor.

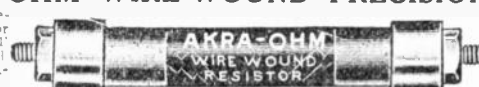
Many unusual mechanical and electrical features are incorporated in these resistors. The wire is single layer wound on a strong Isolant tube that will not break in handling. Insulated wire is used and then covered with a special insulating protective coating that expands and contracts with the wire as it changes temperature under load.

### ACCURATE TO 1/10 OF 1%

This unusually high degree of precision makes these Akra-Ohm resistors especially suited for television work, short wave receiver, resistance coupled amplifiers, transmitters, and motor control. The control above all for accurate scale multipliers for electrical instruments.

### MAKE ACCURATE METER MULTIPLIERS

Low range milliammeters with scale readings of 0-1 MA. can readily be converted, through the use of these resistors, to multirange high resistance voltmeters as suggested by the above diagram. When used as multipliers the Akra-Ohm resistors provide a very economical method of obtaining a wide range of voltages with only one instrument, conserving space and maintaining unusual accuracy. A microammeter or millimeter of good quality employing the Akra-Ohm resistors as multipliers will provide more accurate voltage readings than a number of ordinary inexpensive meters of various ranges.



1 Watt

When deciding the proper resistance value to employ as a multiplier, Ohm's Law must be taken into consideration;

$$R \text{ (ohms)} = \frac{E \text{ (volts)}}{I \text{ (amperes)}}$$

For example: If you have a 0-1 milliammeter which you desire to use as a volt meter with a 0-10 volt scale then;

$$R = \frac{10 \text{ volts}}{.001 \text{ amperes}} = 10,000 \text{ ohms}$$

Note: 1 milliamper is equivalent to .001 amperes. All resistors are of uniform size, having an overall length of 2 1/2". The brass caps at either end fit all 1/4" square five amp fuse clips while the terminal studs are chromium plated to permit easy soldering. Give catalog number and ohmage when ordering. Shipping weight, 8 oz.

### REGULAR STOCK SIZES-1 WATT

No.	Ohms	No.	Ohms	No.	Ohms
3550	10	3555	300	3561	2,500
3551	50	3556	500	3562	3,000
3552	100	3557	750	3563	3,500
3553	200	3558	1,000	3564	4,000
3554	250	3559	1,500	3565	5,000
		3560	2,000		

List Price \$1.25

Akra-Ohm Resistors Up to 5000 Ohms

**\$0.95**

YOUR PRICE

No.	Ohms	No.	Ohms	No.	Ohms
3566	10,000	3570	25,000	3574	45,000
3567	12,500	3571	30,000	3575	50,000
3568	15,000	3572	35,000	3576	60,000
3569	20,000	3573	40,000	3577	75,000

List Price \$1.50

Akra-Ohm Resistors from 10,000 to 75,000 ohms

**\$1.13**

YOUR PRICE  
No. 3580 Akra-Ohm Resistor 90,000 ohms  
No. 3581 Akra-Ohm Resistor 100,000 ohms  
YOUR PRICE  
Ask For Prices On Resistors Above 100,000 ohms

### Surplus Carbon Pigtail Resistors

These resistors are surplus merchandise, having a tolerance of plus or minus approximately 25%. They are obtained from manufacturers of radio sets who for some reason or other decide to discontinue the production of certain models. We do not guarantee or recommend the use of these resistors in circuits demanding accuracy or stability under operating conditions. For accurate work in circuits requiring strict adherence to calculated specifications, we recommend an LYNCH METALIZED PIGTAIL RESISTORS listed elsewhere in this catalog. The resistance elements are 3/16" long by 1/4" in diameter and may be obtained in the values listed below.

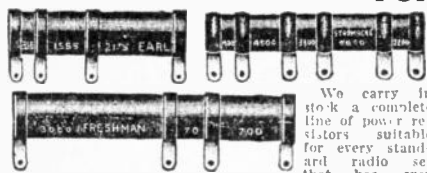
Ohms	Ohms	Ohms	Ohms	Ohms	Ohms
125	500	3,000	20,000	75,000	1.5 meg.
150	1,000	5,000	30,000	250,000	2 meg.
200	1,200	6,000	40,000	500,000	3 meg.
400	1,500	7,000	50,000	1 meg.	4 meg.
450	2,000	10,000	Shipping weight, 1 oz.		

No. 2225 Surplus Carbon Pigtail Resistors

YOUR PRICE, each **\$0.07 1/2**  
25 for \$1.75

RADIO TRADING COMPANY, 25 WEST BROADWAY, NEW YORK,

# "ACCURACY" Tapped Replacement Resistors FOR ALL POPULAR MAKE RECEIVERS



been manufactured.

These tapped voltage dividers are standard for every conceivable set and are ACCURATELY made for each particular set with the correct resistance tapped exactly as they are in the original set specifications.

We unhesitatingly stand behind every one of these resistors. Our resistors are wound on special refractory tubes with nichrome wire. The contact bands are plated with a compound which will not oxidize at normal temperatures, thereby retaining at all times a perfect contact. All resistances are coated with a special compound which is baked on at a temperature of not over 400 degrees Fahrenheit and is elastic in its characteristics which allows for a contraction and expansion of the tube and wire without injury to the wire. All resistor forms are made hollow to effect a maximum radiation of heat.

In addition to this, each tapped section is plainly marked in ohms, showing the exact resistance between any two points.

Do away with guess-work, burned-out tubes, and damaged transformers by using "ACCURACY" superior

resistances. THEY ARE RATED AT FROM 25 to 75 WATTS AND WILL NOT OVERHEAT.

Time and again servicemen have used cheap resistors with uncertain ohmages with the result that the sets so serviced were out of commission again in a short time. "ACCURACY" resistors cost more but are worth a lot more if you figure that they not only replace from 3 to 5 ordinary resistors, but that they save considerable time when you install them. Order by catalog number and name of set.

## IMPORTANT

Resistors of radio sets not listed below may be had on request. In such cases, however, it is necessary to either send the defective unit to us or else specify the number of taps, ohmages between taps and physical dimensions of same; otherwise we cannot replace them.

## SPECIFICATIONS

CAT. NO.	SET	APPROXIMATE RESISTANCE	LIST PRICE	YOUR PRICE	CAT. NO.	SET	APPROXIMATE RESISTANCE	LIST PRICE	YOUR PRICE
B200	ACME AC-7	2000-1200-2500	1.50	\$0.70	B285	GULBRANSEN 8	3100-9475-11,250-150	1.50	.75
B200a	AC-7	2000-290	1.00	.45	B286	" 9	780-3600-20,000	1.50	.75
B201	ATWATER-KENT 41	FILAMENT	1.40	.65	B287	HAMMARLUND HI-Q30	800-2000-1400-3000-2000	1.50	.70
B202	" 61	"	1.40	.65		KENNEDY, CCLIN B	"	"	"
B203	BALKEIT C	3600-770	1.00	.45	B245	" K-1	880-2000-3000	1.25	.56
B204	" F	4500-650	1.50	.70	B246	" K10	3000-1350-900	1.25	.56
B278	B7-B9	7700-12,000-4300	1.50	.70	B247	" 2 9	2000-1500-750	1.50	.70
B205	BOSCH 28	6000 OHMS	1.25	.56	B288	" 32	2600-1800-775	1.25	.56
B206	29-825	10,000-10,000	1.75	.70	B289	ROYAL 60	2000-1200-4000-4000	1.50	.70
B207	48	2000-1450-950	1.50	.70	B290	" 80	1800-250	1.00	.45
B208	58-60-61	2050-1950-180-950	1.50	.70	B290a	"	4000-4000-1200-2000	1.50	.70
B209	BRANDES B-15, 16	2500-45-410	1.25	.56	B291	KING 82	6000-10,000-80-1000-400	1.50	.70
B210	BREMER-TULLY 6-40	3000-560-6500-5000-1660	1.80	.85	B292	101	4000-4000	1.25	.56
B211	" 8-20	4000-5500-3000	1.50	.70	B248	KOLSTER 6J-6K	3000-3000-220-900	1.50	.70
B212	BRUNSWICK 14-21-31	4000 OHMS	1.00	.45	B249	" 6H	5000-5000-800	1.50	.70
B213	BUCKINGHAM 80	3000-3500-2500	1.00	.45	B214	K20-22-25-27-37	840-60-220-3000-3000	1.50	.70
B214	BUSH AND LANE 10	3000-1500	1.00	.45	B215	K21-23-24-28	90-125-900	1.50	.70
B215	COLUMBIA C-1, C-3	SEE KOLSTER K-20	1.50	.70	B293	K24 (210 Tube)	3400-3800-55-80-140-360	1.50	.70
B216	" C-2, C-4	" K-21	1.50	.70	B294	K42	840-140-2600	1.25	.56
B217	Substitute C-5	7200-60-90-700	1.50	.70	B250	K43	1600-1000-380	1.00	.45
B218	" C-6	3400-3800-55-80-140-360	1.85	.84	B251	K44	1450-650-200-350	1.50	.70
B219	930-300	FILAMENT	1.00	.45	B295	PEERLESS K-70	2650-8600-8600	1.50	.70
B219a	930	2000-140	1.00	.45	B252	PHILCO 65	2000	.85	.40
B220	931	410-1650	1.00	.45	B253	"	700	.85	.40
B221	902	6000-2200-135	1.40	.65	B254	" 77	300-700	.85	.40
B222	COLUMBIA 950	2100-120-430	1.25	.56	B255	" 511	2000-1500-1500	1.50	.70
B223	" 961	9000-3200-140-70-700	1.50	.70	B296	RCA-41	2450-3400-6000-12,000	1.50	.70
B224	" 980	7200-60-90-700	1.40	.65	B256	" Sterling	9000-20,000	1.00	.45
B225	" S.G.8	6000-55-100	1.20	.55	B257	" 41	900-450-4000	1.00	.45
B226	EARL 21-22	7500-10,000	1.20	.55	B258	" 33	12,300-8000-5000	1.50	.70
B228	" 31-32	15,000-25,000	1.50	.70	B259	" 17	1900-200-2500-4000-500	1.50	.70
B227	" 41	5000-4000	1.00	.45	B260	" 66	2000-500	1.50	.70
B227a	"	4000 OHMS	.85	.40	B261	" 28	1900-200-2500-4000-500	1.50	.70
B226	"	5000-750	1.00	.45	B262	" 28	4800	.85	.40
B228	EDISON R4-R5-C4	15,000-25,000	1.50	.70	B297	"	325-600	1.00	.45
B229	" R1-R2-C2	5,000-4,000	1.00	.45	B297a	"	2000	.85	.40
B230	"	10,000 OHMS	1.20	.55	B298	" 46	2800-900-3600-1100	1.50	.70
B231	"	12,500	1.30	.60	B299a	"	500-1460-540-80	1.25	.56
B232	FEDERAL D, E, F, G	25,000	1.40	.65	B299	SPARTON 110	25,000-2000-7000	1.50	.70
B233	" H	1300	.85	.40	B263	SONORA B30-B31	800-1000-1200-4000	1.25	.56
B234	"	3500-13,000	1.50	.70	B264	STEINITE 40A	1000-7000-9000-3000	1.50	.70
B235	FREED-EISEMAN 457-Nr57	2000-350	1.00	.45	B265	" 991	1000-1000-250-250	1.50	.70
B236	" 90S	25,000-4000	1.50	.70	B266	" 60	8000-5000-10,000-800	1.75	.70
B237	" 95	15,000-25,000	1.50	.70	B300	70A	2500-8500-12,000	1.50	.70
B238	" 470-Nr70	5000-4000	1.00	.45	B267	STEWART-WARNER 900	5500-10,000	1.50	.70
B239	" 485-Nr85	25,000-20,000	1.80	.85		STROMBERG-CARLSON	"	"	"
B226	" 55-56	25,000-15,000	1.50	.70	B268	641-642-652-654	7800-4500-3000-4000	1.50	.70
B239	"	2000-350	1.00	.45	B269	" 635	2500-3000-3000-770	1.50	.70
B240	FRESHMAN G	300-1250-4300-3000-2100	1.50	.70	B270	" 846	6000-3200	1.00	.45
B241	" G-60-S	1250-4300-3000	1.00	.45	B270a	"	4350-1700-33	1.25	.56
B242	2N60S-2N12-N11	1500-4500-3300-6600-2200	1.50	.70	B271	403AA-403B	2500-3000-3000-70-700	1.50	.70
B280	M-60-S	10,000-12,500	1.75	.70	B272	10-11	4760-3200-5900-100-780	1.60	.75
B281	GILFILLAN 100	4000-1500	1.00	.45	B273	TEMPLE 8-60, 8-80, 8-90	900-3000-2500-800	1.50	.70
B243	GREBE AC-6	750-2800-5900	1.00	.45		U. S. RADIO & TELEVISION CORPS	"	"	"
B244	"	6300-95-695	1.00	.45	B301	APEX-27	4700-8400-10,700	1.50	.70
B282	B & C, 671B	3600-8700-4100-85-950	1.50	.70	B302	" 28	7000-700-2200-70	1.50	.70
B283	AC-7	20,000-6000	1.25	.56	B274	VICTOR RE32-45-75	2000-1400-200-800	1.40	.65
B281	AH-1	3000-8500-8500	1.25	.56	B275	ZENITH ZE-10, 13	6000-7500-8500-2500	1.50	.70
					B303	ZENITH ZE11-14	3200-1200-1200-1600	1.50	.70
					B276	" ZE18	13,000-11,000-9500-1800	1.80	.85
					B304	" ZE6	325-175-310	1.00	.45
					B277	ZE50-51-60-61-70	800-2350-850	1.20	.60

## Polymet Wire Wound Enameled Resistors

10-20 Watts—With Mounting Brackets

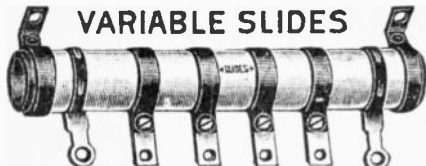


Polymet wire wound tubular resistors are made of the highest grade of resistance alloy wire wound upon refractory tubes and completely covered with heat-resisting, insulating enamel, which protects the wire from the effects of moisture, oxidation or mechanical injury. A tubular diameter of 9/16 inch is uniform for all values, but lengths vary, as tabulated below. Each resistor is furnished with mounting brackets. Shipping weight, 10 oz. ea.

REGULAR STOCK SIZES				20 Watts—3" Type			
No.	Ohms	List Price	YOUR PRICE				
3450	750	\$0.75	\$0.26	3467	750	.80	\$0.28
3451	1,000	.75	\$0.26	3468	1,000	.80	\$0.28
3452	1,500	.75	\$0.26	3469	1,500	.80	\$0.28
3453	2,000	.80	\$0.27	3470	2,000	.90	\$0.31
3454	2,500	.80	\$0.27	3471	2,500	.90	\$0.31
3455	3,000	.85	\$0.29	3472	3,000	.95	\$0.32
3456	3,500	.85	\$0.29	3473	3,500	.95	\$0.32
3457	5,000	.80	\$0.35	3474	5,000	1.05	\$0.38
3458	7,000	.90	\$0.35	3475	7,500	1.05	\$0.38
3459	8,000	.90	\$0.35	3476	8,000	1.05	\$0.38
3460	10,000	1.00	\$0.39	3477	10,000	1.25	\$0.42
3461	12,000	1.00	\$0.39	3478	12,000	1.25	\$0.42
3462	15,000	1.10	\$0.42	3479	15,000	1.35	\$0.45
3463	20,000	1.20	\$0.44	3480	20,000	1.50	\$0.48
3464	25,000	1.25	\$0.45	3481	25,000	1.75	\$0.54
3465	50,000	1.50	\$0.60	3482	50,000	2.00	\$0.69
3466	100,000	1.75	\$0.75	3483	100,000	2.25	\$0.83



## "Ri'e-Ohm" Adjustable Voltage Divider VARIABLE SLIDES



This excellent variable wire wound adjustable resistor has been designed for extra heavy duty. It can be used in any radio power operated set. It is especially useful in all radio set replacement work, used in converting battery sets into power sets.

The correct voltage is obtained by loosening screws of sliders and by moving the latter into the correct position. The screws are then tightened and the work is done. Voltage cannot vary due to the peculiar construction of the resistor and contact sliders. The electrical as well as physical characteristics of the resistance wire, as well as the sliders are such that no reaction can set in between the two, after the resistor has been in use. Oxidation, expansion, finally loose contacts are formed in similar, but inferior resistors. It won't happen with "RITE-OHM".

"RITE-OHMS" are RITE in price too as one of these dividers will take the place of from 2 to 6 ordinary resistances.

We recommend them especially for Freshman or Earl Sets. Shipping weight, 1/2 lb. List Price, \$1.50.

No. 2275 Divider 10,000 Ohms, 3 slides **\$0.75**

(4 1/2" long)

No. 2276 Divider 25,000 Ohms, 4 slides **\$0.75**

(5 1/2" long)

## Ex-Stat Pocket Resistor Kit FOR THE 100% SERVICE MAN

View Closed



View Opened

A pocket kit for service men which meets the demands of the majority of cases. A study of resistor replacement problems has shown that 24 fixed resistances values ranging from 100 ohms to 2 megohms will meet 85% of all service needs. These resistances are of the type used as original equipment in 72% of the broadcast receivers now being manufactured and are color-coded in accordance with the RMA specifications. A chart inside the hinged cover of the metal carrying case makes selection of the desired value easy. Plumbers have long been famed for "forgetfulness". The Radio Service man need no longer be placed in the same category as the owner of this pocket resistance kit need never return to the shop for the correct replacement unit. Values range from 100 ohms to 500,000 ohms. Also 1 and 2 megohm. Shipping weight, 2 lbs.

List Price \$7.50

No. 2220 Ex-stat Pocket Resistance Kit. **\$4.30**

## STANDARD R.M.A. CARBON REPLACEMENT RESISTORS FOR OWNERS OF EX-STAT RESISTOR KITS

We can supply you with replacement Ex-Stat resistors in any of the values contained in your kit. Sold in minimum lots of 3 resistors at one time and in any assorted values you desire.

List Price \$0.45 each

No. 2223 Ex-Stat Replacement Resistors **\$0.18**

YOUR PRICE, per resistor

## Kroblak Midget Resistors

5 Watts

Designed especially for midget, portable and auto receivers where space is at a premium. These pigmy resistors possess the same fine characteristics of construction, precision and operation as the larger Kroblak resistors listed elsewhere. Their power rating does not indicate their maximum capacity but rather the amount of wattage which can be dissipated without the units getting warm. Will safely stand up under an overload

of 100%

Heartily recommended as replacements for all carbon resistors. Compact, accurate, dependable. Resistors up to 15,000 ohms measure 1" long x 9/16" diameter. Resistances up to 25,000 ohms measure 1 1/4" x 9/16". Shipping wt. 1/2 lb.

No.	Ohms	No.	Ohms	No.	Ohms
3381	1	3389	20	3397	750
3382	2	3390	25	3398	850
3383	2.5	3391	50	3399	1000
3384	3	3392	75	3401	1250
3385	5	3393	100	3402	2000
3386	7.5	3394	200	3403	2500
3387	10	3395	300	3404	3000
3388	15	3396	500	3405	5000
				3406	5000

We can furnish any size resistor up to 25,000 ohms not listed above.

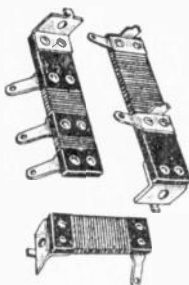
List Price \$0.95

Kroblak Midget Resistors, Your Price, ea **35c**

No. 3416 Kit of 12 assorted resistors. **\$3.85**

YOUR CHOICE

## Wire Wound Strip Resistors



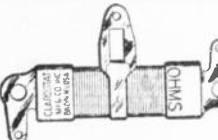
Ideal resistors for grid biasing, grid suppressing and any other light duty purpose. Made of high grade resistance wire, wound on insulating fibre and covered with protective paper which is color coded. Have provisions for mounting in every conceivable position. Available in four different sizes. Shipping weight, 3 oz.

List Price, \$0.20

No.	Color	Ohms
3688	Red	1000
3689	Green	1000
3690	Dark Blue	700
3691	Light Blue	1400

YOUR PRICE **\$0.10**

## Clarostat Fixed Center Tap Resistors



Center tap resistors for use in A.C. filament circuits. Obtainable in all resistance values from 6 to 500 ohms. Shipping weight, 1/4 lb.

List Price \$ .50

No. 2236 Clarostat Fixed Center Tap Resistance **\$0.30**

YOUR PRICE

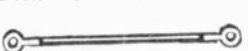
## "ACCURACY" Center Tapped Resistances



These resistors are wound on fireproof base and are precision wound. No shorts. Permanent resistance under all circumstances. The superior resistance at a reasonable price. Available in following sizes.

No.	Size	YOUR PRICE
W-1891	15 ohms total	\$0.15
W-1892	30 ohms total	\$0.15
W-1893	50 ohms total	\$0.15
W-1894	100 ohms total	\$0.15

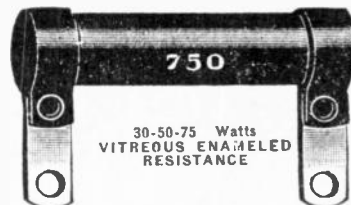
## Flexible Wire Wound Grid Suppressors



We carry in stock 11 sizes which have been found to be the ones required most frequently.

No.	Ohms	List Price	YOUR PRICE
W-1852	1	\$0.25	\$0.15
W-1853	25	.25	.15
W-1854	50	.25	.15
W-1855	100	.25	.15
W-1856	250	.30	.16
W-1857	500	.30	.16
W-1858	750	.30	.16
W-1859	1000	.30	.16
W-1860	1500	.40	.18
W-1861	2000	.40	.18
W-1862	2500	.40	.18
W-1863	3000	.40	.18
W-1864	4000	.50	.20
W-1865	5000	.50	.20

## Kroblak Wire-Wound Enameled Resistors



30-50-75 Watts  
VITREOUS ENAMELED  
RESISTANCE

Kroblak resistors should not be confused with ordinary wire-wound resistors for they are a far superior in principle, design, accuracy and workmanship. The resistance wire, porcelain form and protective coating are so manufactured as to have closely related coefficients of expansion thereby insuring them against cracking and injury when in operation. The inherent resistivity of the resistance wire is such that its ohmage remains practically constant under all operating conditions. These units are RATED ACCORDING TO THEIR CONTINUOUS DUTY WATTAGE which fact insures the protection of both the resistor itself and the surrounding apparatus from damage caused by excessive heat. Shipping weight, 1 lb.

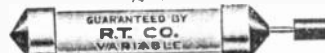
## REGULAR STOCK SIZES

35 Watts 4"x15/16"		50 Watts 6"x15/16"		75 Watts 8"x15/16"	
No.	Ohms	No.	Ohms	No.	Ohms
3300	100	3327	\$0.40	3354	\$0.50
3301	200	3328	.40	3355	.50
3302	250	3329	.40	3356	.50
3303	300	3330	.40	3357	.50
3304	400	3331	.40	3358	.50
3305	500	3332	.40	3359	.50
3306	750	3333	.40	3360	.50
3307	850	3334	.58	3361	.65
3308	1,000	3335	.58	3362	.65
3309	1,250	3336	.58	3363	.65
3310	1,500	3337	.58	3364	.65
3311	2,000	3338	.58	3365	.65
3312	2,500	3339	.58	3366	.65
3313	3,000	3340	.58	3367	.65
3314	4,000	3341	.58	3368	.65
3315	5,000	3342	.58	3369	.65
3316	6,000	3343	.58	3370	.65
3317	7,000	3344	.58	3371	.65
3318	8,000	3345	.58	3372	.65
3319	8,500	3346	.58	3373	.65
3320	10,000	3347	.58	3374	.65
3321	12,500	3348	.70	3375	.85
3322	15,000	3349	.70	3376	.85
3323	20,000	3350	.70	3377	.85
3324	30,000	3351	.85	3378	1.00
3325	40,000	3352	.85	3379	1.00
3326	50,000	3353	.85	3380	1.10

If you do not see the value of resistance for your particular need in the above list, write for our prices on special resistors; made to order on short notice.

## Variable Grid Leaks

1/4 TO 20 MEGOHMS



A perfectly graduated grid leak that may be

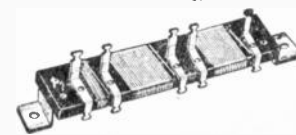
smoothly varied from 1/4 to 20 megohms. Increases the selectivity and sensitivity of any receiver by permitting critical detector grid biasing. Is unaffected by heat or cold and maintains accuracy of range and consistency of resistance. Ideal for resistance-coupled amplifiers, televisions and receivers where the tolerance of resistors is critical. Fits any standard mounting. Shipping weight, 4 oz.

List Price \$0.50

No. 3500 Variable Grid Leaks **\$0.28**

YOUR PRICE

## RCA Voltage Divider Strip



A wire wound strip resistor comprising 490, 1900 and 1000 ohm units. Used in Radiolas 18, 33 and 51. Part No. 2272. Shipping weight, 3 oz. Overall size, 1 1/2" x 1 1/2" x 1/2".

List Price, \$2.95.

No. 2277 RCA Strip Voltage Divider. **\$0.30**

YOUR PRICE

## El Menco High Watt Resistances

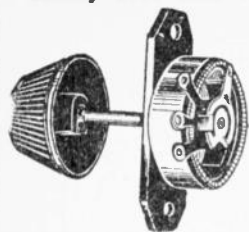


At this special price the 2600 and 190,000 ohm values alone are available due to an exceptional value obtained in a purchase from manufacturers surplus stock. Specify value desired when ordering. Shipping weight, 1/4 lb.

No. 2207 El Menco High Watt Resistances (2,600 or 190,000 ohms) **\$0.15**

YOUR PRICE

## Yaxley 2000 ohm Volume Control

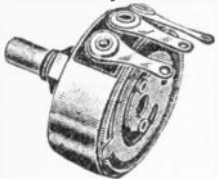


This 2,000 ohm potentiometer volume control is RCA replacement part No. 5091 for use in Radiolas 17, 18, 42 and 44 as well as other commercial receivers. Comes complete with insulating strip for use on metal panels which can be removed for single hole mounting. Knob included. Shipping weight, ½ lb.

List Price \$1.95  
YOUR PRICE **\$0.35**

## "Superior" Volume Control

2000 OHMS



A fine wire wound, air cooled positive contact potentiometer and volume control. Cannot get out of order due to superior construction. Excellent insulation throughout.

List Price, \$1.00.  
No. 2270 Potentiometer.  
YOUR PRICE **\$0.40**

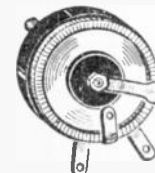
## Yaxley 3 ohm '27 Tube Control



A high current rheostat for use in controlling voltage at '27 heaters. A real rheostat all the way through. Shipping weight, ½ lb.

List Price \$1.00  
No. 1604 Yaxley 3 ohm '27 Tube Control  
YOUR PRICE **\$0.20**

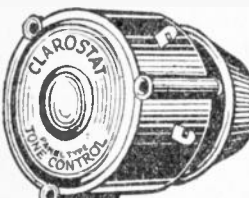
## Carter 8 ohm Rheostat



A sturdy unit which can be used in a thousand and one different ways by all enthusiasts and experimenters. Shipping weight, ½ lb.

List Price \$1.00  
No. 1605 Carter 8 ohm Rheostat  
YOUR PRICE **\$0.20**

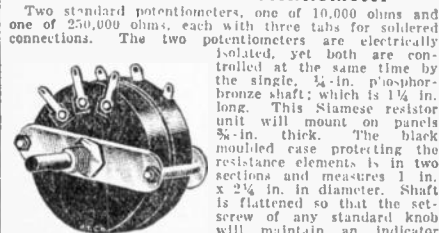
## Clarostat Tone Control (Panel Type)



The Clarostat tone control unit is also furnished for panel mounting on existing or new receivers. Single hole mounting arrangement permits of installation by the drilling of a single 5/16" hole. Completely enclosed in bakelite housing. Installation instructions included. Shipping weight, ¼ lb.

List Price \$1.80  
No. 2232 Clarostat Panel Type Tone Control  
YOUR PRICE **\$1.08**

## Centralab Twin Potentiometer



Two standard potentiometers, one of 10,000 ohms and one of 250,000 ohms, each with three tabs for soldered connections. The two potentiometers are electrically isolated, yet both are controlled at the same time by the single, ¼-in. phosphor-bronze shaft, which is 1 1/4 in. long. This Siamese resistor unit will mount on panels 3/8-in. thick. The black moulded case protecting the resistance elements, is in two sections and measures 1 in. x 2 1/4 in. in diameter. Shaft is flattened so that the set-screw of any standard knob will maintain an indicator line on the knob at the same relative position at all times. May be connected as a volume control, selectivity control, sensitivity control, or tone quality; and in any one of a number of different places in standard circuits. A very handy unit for the Serviceman to have as it may be set for any one of a number of different values, and left in position, as an emergency repair until a fixed unit of correct value can be substituted. A useful item around the laboratory. Shipping weight, ½ lb.

List Price, \$3.50.  
No. 1600 Centralab Twin Pot.  
YOUR PRICE **\$0.50**

## Volume Control Clarostat



A practical variable resistance for all radio applications where a resistance within its range is required. Adjustable over a range of from zero to 500,000 ohms. Small and neat. Shipping weight, ¼ lb.

List Price \$1.50  
No. 2234 Volume Control Clarostat  
YOUR PRICE **\$0.90**

## Pacent Hum Control



A 20 ohm center-tapping resistance for use in A.C. filament circuits. May also be used in all circuits where a 20 ohm potentiometer or rheostat is needed. Shipping weight, ½ lb.

List Price \$1.50  
No. 1603 Pacent Hum Control  
YOUR PRICE **\$0.20**

## Stromberg Carlson Bakelite Rheostat



A sturdy rheostat for battery type receivers or for general use around the service shop or laboratory. Requires three holes for mounting. Furnished without control knob in the following values: 20, 30 or 250 ohms. Shipping weight, 3 oz. Overall Size, 1 1/2 x 2 1/4 x 2 1/4".

No. 2240 Stromberg Carlson Bakelite Rheostat  
YOUR PRICE **\$0.20**

## Non-Inductive Volume Controls



These are the Polymet metal shell carbon volume controls which are accurate, dependable, smooth-running and non-inductive. They are conservatively rated at 2 watts at full resistance. Have three terminals and may therefore be used as either rheostat or potentiometers. Shipping weight ½ lb.

No.	Resistance	List Price \$2.00
VC-1900	25,000 ohms	YOUR PRICE <b>\$0.90</b> less knob
VC-1901	50,000 ohms	
VC-1903	100,000 ohms	
VC-1905	250,000 ohms	
VC-1907	500,000 ohms	
VC-1909	1,000,000 ohms	

## Centralab Volume Control



A 3,000 ohm unit made by Centralab. May be used for replacement purposes in many commercial receivers. Shipping weight, ½ lb.

List Price \$2.00  
No. 1608 Centralab 3,000 ohm Volume Control  
YOUR PRICE **\$0.30**

## Centralab Dual Volume Control

This 20—50,000 ohm dual unit is for replacement in all Earl and Freed receivers but makes an excellent volume control for special receivers using screen grid tubes. Shipping weight, ½ lb.

List Price \$2.00  
No. 1609 Centralab Dual Volume Control.  
YOUR PRICE **\$0.39**

## Super Power Clarostat

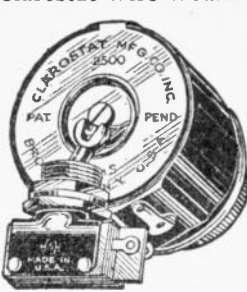


A heavy duty variable resistance for use in radio power circuits. Line voltage control, plate and filament supply control, in radio transmitters, motor speed control, and field regulation in generators. In three types all rated at 250 watts:

A—Filament Control ¼ to 10 ohms. B—Low Range 25 to 100 ohms; C—High Range 200 to 100,000 ohms. State range desired. Shipping weight, 1 lb.

No. 2236 Super Power Clarostat.  
YOUR PRICE **\$3.60**

## Clarostat Wire Wound Volume Controls



Made with or without 110 volt switch.

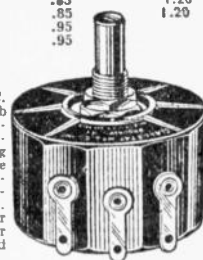
Potentiometer type—bakelite cased, metal end plate. One hole mount. Can be utilized for many valuable purposes in all receivers.

YOUR PRICE

Cat. No.	Ohms	Potentiometer	Tapered
2280	100	.65	.90
2281	20	.65	.90
2282	300	.65	.90
2283	400	.65	.90
2284	500	.65	.90
2285	1,000	.65	.90
2286	2,000	.65	.90
2287	3,000	.65	.90
2288	5,000	.75	1.05
2289	10,000	.75	1.05
2290	15,000	.75	1.15
2291	20,000	.85	1.20
2292	25,000	.85	1.20
2293	40,000	.95	
2294	50,000	.95	

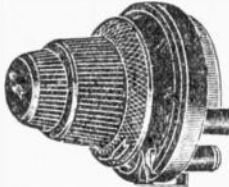
## NOTE

Add 30c for 110 volt A.C. switch, as illustrated. Knob included, 5c extra for insulating washers for metal panels. Add T.P. to catalog number to indicate you are ordering a tapered potentiometer—P. for plain potentiometer. Add S. to our Cat. No. to indicate potentiometer with switch. Add T.S. to our Cat. No. to indicate tapered potentiometer with switch.



## Amsco Rheostats and Potentiometers

Dual and Single Types—Vernier Action



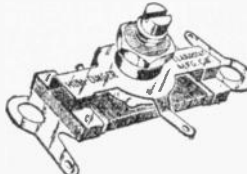
Ruggedly constructed rheostats for safeguarding the life of radio tubes. The bases are of genuine condense. All contacts are phosphor bronze, highly nickel-plated. The resistance elements are of the highest grade nichrome wire and are wound by a special method, making them everlasting. All the

single type rheostats are of the vernier action type, affording the most critical adjustment of filament or other voltages.

The dual rheostats make it possible to control two tubes individually, yet with the same unit. This is effected by having two resistance elements, one inside the other, controlled by two telescoping knobs. All units are mounted through two holes with screws provided. Ideal where space is at a premium. Shipping weight, ½ lb.

No.	List Price \$0.75	
No. 2243 Amsco 6 ohm Vernier Rheostat		<b>\$0.20</b>
YOUR PRICE	List Price \$0.85	
No. 2244 Amsco 20 ohm Vernier Rheostat		<b>\$0.25</b>
YOUR PRICE	List Price \$0.85	
No. 2245 Amsco 30 ohm Vernier Rheostat		<b>\$0.25</b>
YOUR PRICE	List Price \$1.50	
No. 2246 Amsco Double 20 ohm Rheostat		<b>\$0.35</b>
YOUR PRICE	List Price \$1.75	
No. 2247 Amsco 2000 ohm Potentiometer		<b>\$0.45</b>
YOUR PRICE		

## Clarostat Hum-Dinger



A strip resistor with an ingenious movable center contact. Single hole mounting with screw driver adjustment. An improved center tapping resistance for obtaining an accurate hum balance in A.C. receivers. May be used wherever a resistance requiring occasional adjustment is needed.

Supplied in all resistances from 5 to 400 ohms. State resistance wanted. Shipping weight, 2 oz.  
List Price \$ .75  
No. 2295 Clarostat Hum-Dinger  
YOUR PRICE **\$0.45**



# Bargains In Battery Sets

We have listed here the greatest radio battery bargains that have ever been offered.

The radio sets, which you will find listed in the following pages, are all standard sets made by the greatest and best known radio set manufacturers in America.

All of these sets are battery sets; but this is only one reason why they are sold at such ridiculously low prices.

The other reason is that these sets are mostly demonstration and display models from New York's largest radio and department stores.

We have been able to make connections with a number of houses in New York City, and we constantly stock these fine sets at remarkable prices. Due to these circumstances, we are enabled to sell the sets to you at only a fraction of their original cost.

Even if you do not need any one of these fine sets, here is a tremendous opportunity to get valuable radio parts at prices next to nothing.

Every one of these sets contains, in addition to the

valuable cabinet, a goodly quantity of radio parts, such as condensers, transformers, sockets, tuning dials, coils, etc.

There is not a single set that does not contain anywhere from \$15.00 to \$50.00 worth of radio parts, if you had to buy them separately. In many cases, it will pay you to rip a set apart in order to get these valuable parts at unheard of prices. So, even if you do not need a set, the tremendous value in the separate parts will recompense you for the small outlay.

Most of the sets can readily be electrified by means of eliminators, or by making small structural changes, which anyone handy with tools and understanding radio can readily do. Most of the parts needed are listed in this catalog.

A number of our customers have made as much as \$25.00 and \$30.00 on each one of these sets by installing them, incidentally making a profit on tubes, loud speakers, eliminators, etc.

Remember, we do not sell you these sets as brand new. They all have been somewhat handled, but they are all in excellent condition, and, by going over the cabinets with some furniture polish, or otherwise renovating them, they will make a first class appearance and, in most instances, you will not be able to tell the set apart from a new one.

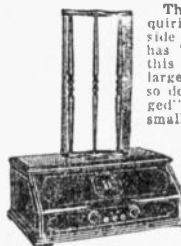
## IMPORTANT!

Prices are for complete sets, as illustrated, including cabinets (Radiola 25 complete with loop). Prices include no accessories, such as tubes, loud speakers, etc. On this special sale, we cannot exchange nor accept returns on them for credit.

We have a good supply of these sets on hand, and, in most cases, can ship without delay.

Due to the exceedingly low prices, we cannot accept C. O. D. or part C. O. D. terms on these sets. Full amount must accompany every order.

## Radiola 25 Superheterodyne



The "25" is a loop-operated set requiring 6 "X-100" tubes. No outside aerial is needed. The receiver has "10-K C." selectivity. Tuning of this receiver is accomplished through large "thumb-operated" tuning drums, so designed that stations may be "logged" directly on the drums. The small center knob controls a multiple contact switch which changes the circuit to include one or two stages of A.F. A two tone mahogany veneer cabinet of original pattern houses the chassis and batteries. Comes complete with loop aerial. Its overall dimensions are 24x19x12 inches high. Shipping weight, 55 lbs.

List Price \$265.00

No. 2109 Radiola 25.  
YOUR SPECIAL PRICE

**\$7.65**

## Atwater Kent Model 35



One of the most compact receivers ever offered to the public. 3 stages R.F. 3 variable condensers are used. Overall dimensions are: 17x24x8 1/2 in. The chassis is housed in a brown crackle-finish pressed metal cabinet. This is a "one-dial control" receiver. Incorporated in this set is a 6-wire cable, each wire of which is rubber insulated and "color coded." This shielded receiver has very high "gain" and may be used with antennas of any length, without in the least affecting the tuning. The variable condensers are of the "single bearing rotor" type. This set likes the following tubes: 5 type 201A and one type 112A or 117A tubes. Shipping weight, 16 lbs.

List Price \$65.00

No. 2104 A.K. Model 35.  
YOUR SPECIAL PRICE

**\$11.75**

## Radiola Superheterodyne AR-812



One of the most famous radio sets in America. This set is placed on a table, the battery switch turned to "on", and music will be heard—without an outdoor antenna; it works with a loop aerial built inside the cabinet. The set is super-sensitive and, in certain localities, it is set on a east coast, to hear west coast stations. The cabinet holds all the batteries for the six "dry-cell" tubes required. Some experimenters tune in short wave stations and use the AR 812 as the INTERMEDIATE FREQUENCY AMPLIFIER. In that way the tremendous amplification obtainable from this receiver is used to the fullest extent. A push-all switch (center) turns the set on and off; another (lower left) cuts in either one or two stages of A.F. amplification. Although the cabinet is 35 inches long, 11 1/2 deep and 11 1/2 high, the panel of the receiver is only 19 inches long and 9 inches high. The difference lies in the two end compartments for "A" and "B" batteries. Six type UV198 tubes are required for this receiver. Drycell power tubes, type "20", may be used in this set if a Naid or similar adapter is used. Shipping weight, 45 lbs.

List Price is \$220.00

No. 2103 Radiola AR-812  
YOUR PRICE

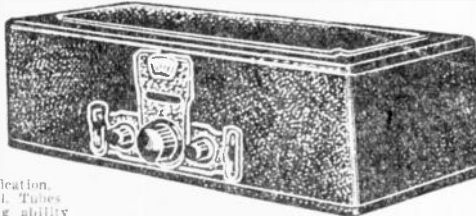
**\$8.75**

## Crosley Band Box—Model 601

Now is your chance to get the finest battery radio on the market at a price that will enable you to close every sale and make BIG PROFITS. Every prospect in your territory knows Crosley. There are very few good battery sets available. Crosley is one of the best. These receivers are in perfect working order having been used only as demonstration sets for short periods of time.

### SPECIFICATIONS

The Crosley Band Box is a neutrodyne radio employing a two . . . tube radio frequency and the balance are for detector and audio amplification. It has a single station selector with illuminated dial. Tubes used: 5 201 A, 1 112A. Excellent distance getting ability, and fine selectivity with true tone qualities. The cabinet has frosted brown crystalline finish and may be easily removed so that the set can be installed in a console. Shipping weight, 21 lbs.



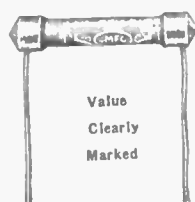
No. 2112 Crosley Bandbox.  
List Price \$55.00

YOUR PRICE

**\$13.95**

## Lynch Metallized Pigtail Resistors

Guaranteed to Maintain their Ohmage



Value  
Clearly  
Marked

careful check for ACCURACY THROUGHOUT THE ENTIRE LENGTH OF THE RESISTANCE element in making. Subsequent to its inclusion "flashing" at double the rated wattage of the unit and additional tests for accuracy before shipment.

IT IS A LONG ESTABLISHED FACT THAT METALLIZED RESISTORS ARE FAR MORE ACCURATE AND DEPENDABLE THAN CARBON RESISTORS. The only objection to the use of metallized resistors in place of carbon resistors in the past has been their comparatively high price. Now, however this deterrent has been completely eliminated. PRICES HAVE BEEN CUT TO THE SAME LEVEL AS THOSE OF CARBON RESISTORS.

The special ceramic casing of Lynch Resistors is of sturdy construction and maximum heat dissipation. It will withstand more than average shocks and jitters as well as minimize possibility of damage by crushing.

Many advances have been made in the design of resistance units since their early use, but a most outstanding improvement is the molded end-cap which is a feature of LYNCH RESISTORS.

THESE CAST METAL END CAPS INSURE POSITIVE ELECTRICAL AND MECHANICAL CONNECTIONS. They cannot loosen since they are actually integral with the resistance element and its protective tubing. The cap is off is tapered for insertion in standard cartridge type mountings where interchangeability is desired. TINNED COPPER PIGTAILS ARE MOLDED INTO THE CAPS, and are not soldered or strapped thereto. By this method a clean, sure 100% contact between resistance element, cap and pigtail is made certain. Available in 1/2, 1, 2, and 3 watt.

Power ratings:

### MOST POPULAR SIZED

Ohms	Ohms	Ohms	Ohms	Ohms
500	8,000	65,000	500,000	5 meg
750	9,000	75,000	750,000	6 meg
1,000	10,000	90,000	1 meg	7 meg
2,000	12,000	100,000	1 1/2 meg	8 meg
3,000	15,000	125,000	2 meg	9 meg
4,000	25,000	150,000	2 1/2 meg	10 meg
5,000	30,000	200,000	3 meg	
6,000	40,000	250,000	3 1/2 meg	
7,000	50,000	300,000	4 meg	

The 1/2 watt size may be had in from 500 ohms to 5 megohms; the 1 watt size, 500 ohms to 10 megohms; 2 watt size, 250 ohms to 250,000 ohms; and the 3 watt size from 500 ohms to 250,000 ohms. Values of resistors not listed above may be had on request.

List Price \$0.50  
No. 3905 Lynch 1/2 Watt Resistors

**\$0.18**

List Price \$0.50  
No. 3906 Lynch 1 Watt Resistors

**\$0.18**

List Price \$0.75  
No. 3927 Lynch 2 Watt Resistors

**\$0.24**

List Price \$0.90  
No. 3908 Lynch 3 Watt Resistors

**\$0.30**

YOUR PRICE

## Kurz-Kasch Vernier Dial



The dial attaches to the shaft of the instrument to be tuned by the famous Kurz-Kasch Split Button method. Friction action employed with a spring ever ready to compensate for wear. Vernier ratio 11 to 1.

Excellent For Short Waves

Short wave stations tune in very clearly and reliably. A high ratio vernier dial is used to rotate the tuning condensers.

may be entirely pressed by unnoticed. With the Kurz-Kasch Vernier Dial the

knob must be rotated 14 times before the calibrated scale revolves once, thus insuring extremely fine tuning results.

The outside of the dial is handsomely chased in a very decorative effect. Shipping weight, 1 lb.

List Price \$2.00

No. 1580 Kurz-Kasch Vernier Dial  
YOUR PRICE

**\$0.75**

RADIO TRADING COMPANY, 25 WEST BROADWAY, NEW YORK, N. Y.

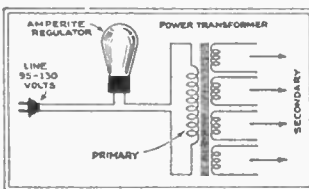


## Amperite Voltage Regulator

Automatically Stabilizes Fluctuating Voltages

No radio set, operating on the house electric current can perform at its best without provision for automatic regulation of line voltage fluctuations.

To make the reason for this clear let us compare, for example, your house lighting current supply with your water supply. You know that when a great deal of water is being drawn from one faucet the pressure in the main supply pipes is reduced to such an extent that less, or perhaps no water can be obtained from other faucets. Just so with your electric current supply and radio when electrical apparatus is used. Volume is reduced and the quality is poorer because the tubes are not working at their correct voltage.



Now reverse the picture and see what happens when these various electrical devices are shut off. There is a resulting rush of current far beyond the needs of your

radio. The tubes and power units in your receiver are overloaded. They may even blow out from the sudden strain. In any event, the quality of reception is spoiled.

Until AMPERITE was perfected, radio manufacturers, experimenters and service men had no practical means of controlling these annoying and expensive voltage fluctuations in the receivers. Now they have the AMPERITE Self-Adjusting Line Voltage Control which can be provided for very easily and which renders an enormously valuable service to the users of their receivers—in the saving of tubes and improving reception.

AMPERITE is a special tube containing a resistance element, which accurately and instantaneously responds to line voltage fluctuations and permits only the proper amount of current to pass. It has a base with two prongs which instantly fit into a standard radio tube socket. Connect the socket in series with the primary of the power transformer, insert the Amperite regulator, and the job is done.

No.	Output Tubes	In Set	No. Tubes	Use
3485	2-45's (or Pent)	7 to 10	9-A-5	
3486	1-45	5 to 8	7-A-5	
3487	1-45	3 and 4	6-A-5	
3488	1 or 2 12A (71A)	6 to 9	7-A-5	
3489	1 210	5 to 8	6-A-5	
3490	2 250	7 to 10	9-A-5 (use 2)	

When operating the AMPERITE will get warm. It should not operate above a very dull red glow. If the AMPERITE burns higher than a dull red glow—use the next larger size e.g. if 7-A-5 is too bright, use 8-A-5, etc. Shipping weight 1 lb.

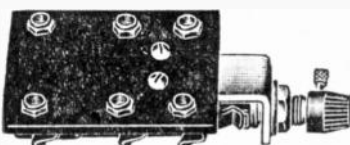
Amperite Voltage Regulator all types, state which

YOUR PRICE **\$1.62**

No. 3491 Amperite Mounting Socket.

YOUR PRICE **\$0.21**

## Two-Speaker Relay Switch



A cleverly designed speaker relay switch which permits two speakers to be played either simultaneously or separately. A turn of the knob to the right connects one speaker, to the left the other. When left in a neutral position both speakers will operate together. Ideal for installing additional speakers in ballrooms, homes, auditoriums and for paging systems in hotels and restaurants.

Equipped with phone tip jacks which makes its installation a matter of several minutes. Merely plug the tips of the two speakers in the provided tip jacks and then bring two leads from the speaker posts of the set to the two remaining jacks. May be mounted in any convenient place through a 3/4" hole on any panel up to 1/2" thick. Comes complete with beautiful sure-grip knob and directional set screw. Shipping weight, 1 lb.

List Price \$2.50  
No. 1962 Two Speaker Relay Switch  
YOUR PRICE **\$0.75**

## Yaxley Single-Circuit Switch



A single contact, rapid-fire action rotary snap switch that effectively opens and closes any circuit in which it is employed. Can be used as a filament switch, phono-radio switch, shorting switch and in many other ways. Contact springs are made of non-corrosive, highly tempered metal and are activated by a heavy insulating fibre disc mounted on the shaft. Comes equipped with "On-Off" polished name plate, beautiful brown bakelite knob with sure-grip friction tip and oxidized shank nut for panel mounting. Shipping weight, 1/2 lb.

List Price \$0.50  
No. 1961 Yaxley Single-Circuit Switch  
YOUR PRICE **\$0.20**

12 for \$2.25

## Stewart Warner Rotary Snap Switch



This is a fine, high-grade electric switch, approved by the Board of Fire Underwriters. Has a knurled bakelite marble finish knob 1 1/2 inch in diameter. Bushing nut has a gunmetal finish. Long 16-inch leads. 5 amp. 125 v. ts. Shipping weight, 4 oz.

List Price \$0.75  
No. 1963 Stewart Warner Rotary Snap Switch.  
YOUR PRICE **\$0.18**

10 for **\$1.60**

## Pilot Lights



A standard replacement pilot light for all receivers. Made with either 2.5 or 6 v. filament. Specify which when ordering. Shipping weight, 1/2 lb. Only sold in 10 lot.

No. 1651 Pilot Lamp  
YOUR PRICE **\$0.55** for 10

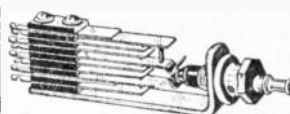
## H and H Rotary Snap Switch



A 3 amp., 250 volt A.C. power switch with a rotary snap-action control. Has an extra long shank that will engage practically all radio panels. A ruggedly built, completely shielded, dependable switch that will make and break any circuit using up to 3 amps. without sparking. Approved by Underwriters' Laboratories. Shipping weight, 4 oz.

List Price \$0.50  
No. 1960 H and H Rotary Snap Switch  
YOUR PRICE **\$0.24**

## Freed 8 Point Snap Switch



An 8 point anti-capacity switch with a push-pull action used for phono-radio changeover in Freed combination sets. May be used for the original purpose or in many circuits of differing character as for example in motor switching circuits for set testers. Shipping weight, 2 oz. Overall size, 1 1/2 x 1 1/2 x 3/4".

No. 1644 Freed 8 Point Snap Switch.  
YOUR PRICE **\$0.20**

## Amsco Resistors



These well known resistances are offered in the following sizes: 2500; 15,000; 25,000; 100,000; 250,000; 500,000; 1,000,000 ohms. These are non-inductive, power type resistances with metal end caps to fit in standard grid leak mountings. State resistance desired.

List Price 50c  
No. 2230 Amsco Resistor  
YOUR PRICE **\$0.20**

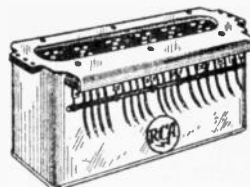
## Clarostat Strip Resistors



Resistance strips with patented soldering lugs are obtainable in the following values for use as biasing resistances, grid suppressors, etc. Be sure to state resistance wanted.

No.	Resistance	List Price	YOUR PRICE
2297A	1 to 75 ohms	\$0.15	\$0.10
2297B	100 to 500 ohms	0.25	0.15
2297C	600 to 900 ohms	0.30	0.18

## Radiola "25" and "28" Catacombs



These catacombs, the "hearts" of these well-made sets, are replacements for defective units. Thus, the wide-awake Service Man can, in about 10 minutes, make a very nice profit by repairing these Radiola superheterodynes. In addition, these foundation units are used to construct portable receivers for service work, camping

(etc.) short-wave sets, automobile radio sets, interference detectors, demonstration sets, phonograph-radio combinations, built in sets, and comparison or stand-by shop receivers. (Much data on these models has appeared in the following issues of RADIO GRAPH: April, 1930, containing the "25" circuit; June, 1930, the All-212 "Sound-Portable" circuit; March, 1931, the "28" circuit; November, 1930, "Radiola '28' at 80 Meters"; May, 1931, "Operating the '28' with 2-Volt Tubes"; August, 1931, "Modernizing the '812' and '25'".

These catacombs are completely wired. Each assembly is provided with signal leads.

The "25" uses six Type UX-199 tubes; and the "28", seven UX-199's and a Type UX 120. Hundreds of thousands of these Radiola catacombs have been sold in Brunswick, Radiola, and Victor phonograph-radio and radio sets. Many of them, now out of service, require only the replacement of the catacomb to put the set into use once more; this is the most simple manner of effecting a repair necessitated by burnt-out A.F. or I.F. transformers, circuit oscillation, broken leads, shorted by-pass condensers, open grid lead, and other shorts or opens in this assembly. In favorable localities, these sets will go wonders when properly equipped with the new 2-volt general-purpose, screen-grid, and pentode tubes.

Shipping weight is 6 lbs.

List Price of No. 25 and No. 28 is \$68.00.

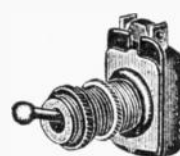
No. 9441 Radiola 25 Catacomb.

YOUR PRICE **\$5.10**

No. 9042 Radiola 28 Catacomb.

YOUR PRICE **\$6.95**

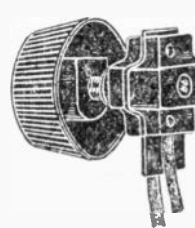
## Cutler-Hammer Toggle Switch



This switch carrying the famous "C" trade-mark is of the "long neck" type and may be used to break circuit, carrying 3 amps. at 125 V. (or 1 amp. at 250 V.). Its black oxidized finish blends with nearly every kind of finish, whether wood or metal. Just the thing for use on transmitter panels, laboratory equipment, service instruments, home-built radio sets, public address power amplifier racks, and wherever a positive off-on switch of toggle type is required. Lugs for soldered connections are provided. Will fit on panels 1/4 in. thick. Moving parts encased in moulded bakelite shell. Passed by Underwriters' Laboratories. Body of switch is only 1/2 in. deep; length 1 1/4 in.; width, 3/4 in. Every Serviceman should carry at least one. Shipping weight, 4 oz.

List Price 75 cents  
No. 1601 Cutler-Hammer Switch.  
YOUR PRICE **\$0.25**

## G.E. Filament Switch

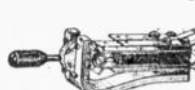


A husky power switch made by General Electric and designed to break 3 amperes at 110 v. or 1 ampere at 250 v. Furnished complete with knob and 8" leads. Approved by the Underwriters' Laboratories. Shipping weight, 1/2 lb.

No. 1612 G. E. Filament Switch.

YOUR PRICE **\$0.20**

## Anti-Capacity Switch

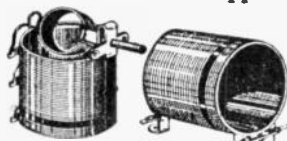


This is a positive contact switching device which exhibits many advantages over the usual type of anti-capacity switch. Equivalent to a four pole double throw switch or may be wired for various combinations. Excellent for use as a Phono-Radio changeover switch or in the construction of test equipment. Switches of this type are becoming harder and harder to obtain. Has definite "off" position at center with all contacts open. Nickel plated parts with real bakelite insulation. Shipping weight, 3/4 lb. Overall dimensions, 2 1/2 x 1 1/2".

List Price \$2.50  
No. 1627 Anti-Capacity Switch  
YOUR PRICE **\$1.25**



## Genwin Self Supporting Coils



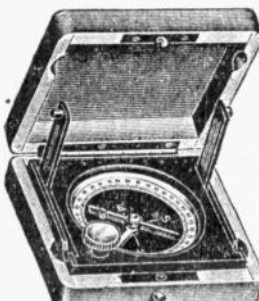
These coils cover the band from 200 to 550 meters when used with .0005 condensers. They are ideal for use in the following: Drake, Universal and similar circuits calling for regeneration in the detector stage. Wound on circular forms with cellulose binder leaving no dielectric within the field of the coil. These may be used to advantage in the construction of battery operated and portable receivers requiring a high sensitivity with few tubes. Both coils have handy soldering lugs. Shipping weight, 1 lb.

No. 1682 Genwin Two Circuit Antenna Coil. **\$0.55**  
YOUR PRICE

No. 1683 Genwin Detector and Ticker Coil—Three Circuit. **\$0.95**  
YOUR PRICE

Overall size, 2 1/2 x 2 1/2 x 3 1/2".

## Stoppani Jewelled Compass



A genuine Belgian Stoppani Compass; solid bronze, Parkerized; graduated in 1/10; Ruby Jewelled. Has surveyor's elevated sight; set screw in corner to hold needle rigid when not in use. Said to have cost U. S. Government \$29.00. Sportsmen can never hope to equal this wonderful value. Very highly calibrated for direction and extremely accurate. Size: 3 1/2 x 3 1/2 in mahogany case.

### LENDs SELF TO MANY RADIO USES

The Stoppani Compass, being a precision instrument, lends itself admirably for use in the Radio experimenters test laboratory. It affords an ideal means of determining the polarity of magnets, electro-magnets and solenoids carrying current. Since the compass needle is itself a magnet having a North-Seeking (really the South) and South-Seeking (really the North) pole; and since as we all know, like poles attract each other and unlike poles repel each other. It is not necessary to bring the compass in the vicinity of the magnet under test. The North pole of the compass needle will then point to the North pole of the magnet under test or the South pole of the needle will point to the South pole of the magnet depending of course, upon their relative positions.

**MAY BE USED AS A GALVANOMETER**  
Because of its uniform magnetic property, high sensitivity, and delicate frictionless bearings, the Stoppani compass may be utilized to advantage as a galvanometer for detecting electric currents in experimental or conventional radio circuits. The compass is easily and readily converted into said galvanometer by merely winding several turns of ordinary radio wire completely around the face of the compass, leaving small spaces between turns to observe the movements of the needle. The ends of the wire are brought out as test leads to be inserted in series in circuits under test. A deflection of the compass needle in either direction indicates the presence of an electric current. Incidentally the intensity of the current may be closely approximated since the force with which the needle grades is proportional to the strength of the current.

Excellent for the automobilist, camper, tourist, Radio service man, experimenter, etc., and will make a good item for you to sell at a nice profit.

List Price, \$50.00

No. 1637 Stoppani Compass. **\$4.50**  
YOUR PRICE

## Sealing Compound



Service filling, sealing and insulating compound. Can be used for condenser dipping, transformer sealing or any service need that requires a compound that flows easily at normal heat. All repaired condenser blocks should be covered with this pitch which protects them from moisture. Just place the pall on an electric or gas stove and it is ready to pour. This item is indispensable to the service man, and will pay for itself in no time. Put up in two sizes. Shipping weights 8 1/2 lbs. and 1 lb. respectively.

No. Size List Price YOUR PRICE

1691 1 gallon can \$2.00 **\$0.90**

1692 1 quart can .90 **\$0.35**

## Drive Drum Cable and Belts

Replacement Bands, Belts and Cords For All Popular Make Sets

These cables bands and cords are made the exact duplicate of the original supplied with the set even to the quality of the wire cable or eyelet.



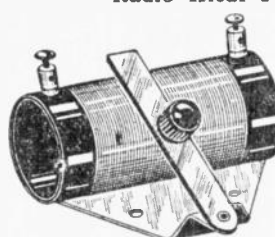
No.	Make	Model	List Price	YOUR PRICE
2180	Majestic	70, 71, 72	\$0.15	\$0.25
2181	Bosch	48A, 58A	.40	\$0.25
2082	R. C. A.	17, 60	.40	\$0.25
2083	Crosley	40S, 60S	.40	\$0.25
2084	Balkett			
	Freshman	First National	.45	\$0.30

No.	Make	Model	List Price	YOUR PRICE
2085	Atwater Kent	(Left & Right)	37	.45
2086	Crosley	600, 601	.45	\$0.30
2087	Colonial	31, 32	.45	\$0.30
2088	Fred Elsemann	NI160	.45	\$0.30

No.	Make	Model	List Price	YOUR PRICE
2089	R. C. A.	33	.25	\$0.10
2090	Brunswick			
	Bremer-Tully	14, 21	.30	\$0.15

Give catalog number and model of set when ordering. Shipping weight, 1/4 lb.

## Radio Klear-Tuner



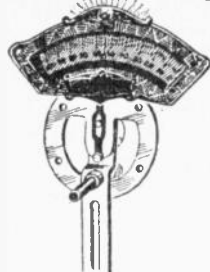
A simple but effective wave trap for minimizing interference. Consists of a fixed condenser together with an inductance varied by means of a slider. A readily adaptable article for the service man in congested districts.

Shipping Weight, 1 lb.

List Price \$1.00

No. 1634 Radio Klear-Tuner. **\$0.60**  
YOUR PRICE

## Full-Vision Dial Set

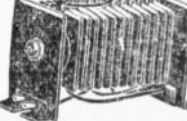


Differs from all other types of illuminated dials in that the pointer itself sweeps across the face of the walnut-colored celluloid scale which remains stationary. Has universal mounting provisions and will engage both 3/4" and 7/8" shafts. Comes complete with Euxetron plate and pilot light socket. Shipping weight, 1 lb.

List Price \$3.50

No. S1684 Full Vision Dial Set. **\$1.05**  
YOUR PRICE

## Kodel Dry Rectifier (NEW TYPE)



This efficient dry rectifier unit may be used not only as a supply unit for dynamic reproducers designed to operate at 6 volts but also as a rectifier unit in a trickle charger. Its rated output at 7 1/2 v. is 1.5 amperes. When used as a rectifier in a dynamic reproducer field coil current supply unit it is necessary to remove a slight A.C. ripple from the output. This is done by connecting one of our large size electrolytic condensers across the rectifier output as shown in the figure. Experimenters may purchase one or more of these rectifiers to use in the construction of "A" eliminators. Each unit may be depended upon to light four "DIA's" or similar 5 v. 25 amp. tubes or a greater number of the new two voltors. For detailed data on rectifiers of this type and their use in field coil and "A" supply units reference should be made to the OFFICIAL RADIO SERVICE MANUAL, the RADIO SERVICE MAN'S HANDBOOK or past issues of RADIO-CHART. Shipping weight, 1 lb. Overall Size, 2 1/2 x 3 1/2 x 3 1/2" high.

Provided with two input and two output lugs for soldered connections.

No. 1665 Kodel Dry Rectifier (New Type) **\$1.60**  
YOUR PRICE

## Peerless Screen Grid R.F. Coils



A set of four matched tuning coils of superlative excellence for use in Peerless receivers or in constructional work. An ideal transformer for use with the screen grid or new variable mu tube. Has two primary windings so designed as to increase sensitivity at low frequency end of tuning range. For use with .0035 tuning condensers. Four coils to the set. Complete with mounting bracket. Shipping weight, 1/2 lb. Each Coil, 1 1/2" x 3".

No. 1667 Peerless R.F. Tuning Coils. **\$0.90**  
(Set of 4) YOUR PRICE

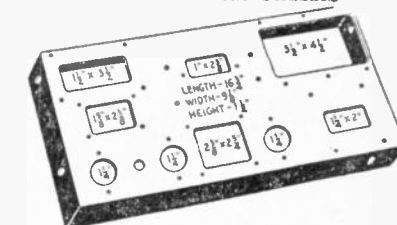
## Freshman T.R.F. Coils



These are the Diamond weave T.R.F. coils which made the Freshman nine famous. Designed for use in tuned radio frequency receivers with .00035 condensers. For replacement in Freshman Masterpiece receivers or in constructional work. Only sold 3 to a set. Shipping weight, 1 lb. Overall size, 3 1/2 x 3 1/2 x 3 1/2".

No. 1668 Freshman T.R.F. set of 3 Coils. **\$0.30**  
YOUR PRICE

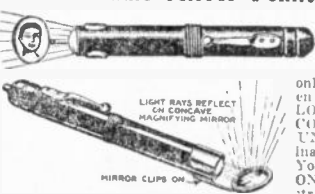
## Punched Metal Chassis



A handsome green enamelled metal chassis for amplifiers, power supplies, etc. Punched for three tube sockets and with six larger openings to permit sub panel wiring of transformers, condensers and chokes. Great for constructing your own set or power amplifier or power pack. Shipping weight, 6 lbs. Overall size, 8 1/2 x 11 1/2 x 1 1/2".

No. 1699 Punched Metal Chassis. **\$0.70**  
YOUR PRICE

## Brand New! Radio Mirror Penlite

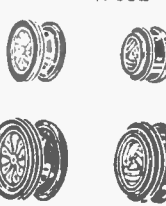


Latest and cleverest Tool for Radio Service men. The only device that enables you to look around corners or underneath hard-to-reach spots. Your vision is ONLY in a straight line, but

with the Mirror-Penlite you can look around a 45 degree angle. You can now look under the whole chassis and see every nut, every wire, every socket, behind condensers, transformers, etc. This is made possible by the powerful pocket flashlight to which is attached a GENUINE DENTAL MAGNIFYING MIRROR. Mirror clips on or off so flashlight can be used alone if desired. The cleverest device yet. Complete with battery and bulb. Shipping weight, 6 ozs.

List Price \$2.50  
No. 1695 Mirror-Penlite with Battery and Mirror. **\$0.85**  
YOUR PRICE

## Wood Tuning Knobs



Carved wooden Knobs for use on radio receiver tuning controls. Carved in tasteful designs and finished in dark oak. Complete with set screw. These knobs are obtainable singly or in sets of three.

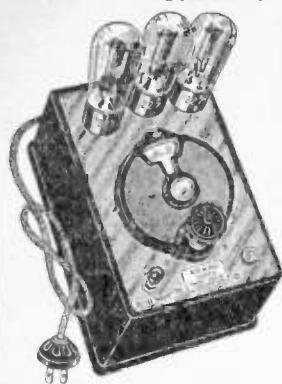
No. 1635 Wood Knobs **\$0.15 ea.**  
YOUR PRICE

No. 1636 Wood Knobs **\$0.40**  
SET OF THREE



# THE LATEST AND BEST IN SHORT WAVES

## Air King Superheterodyne Short-Wave Converter



The Air King converter is the most simple and inexpensive form of the world-renowned, superheterodyne circuit, and its use in this device enables "short-wave" stations between 20 and 115 meters to be heard on any standard "broadcast-wave" receiver.

**THIS ADAPTER TRANSFORMS ANY BROADCAST RECEIVER INTO A SHORT-WAVE SUPER HETERO-DYNE.**

Do you know that during most of the summer — when King Static rides the broadcast band from 200 to 515 meters — stations are heard without static interference on the waves below 160 meters? One demonstration of the clear reception of the short-wave transmitter of a well-known broadcast station, such as WEAF, WJLB, WJLB, or KDKA, makes a sale and a friend. Many owners report loud speaker volume of music from England, Holland, France, Germany, Mexico, Canada and South America.

Three type '27 tubes are required. A snap-switch-controlled filament transformer, which connects to the 110-volt light line by means of a 4-ft. cable with plug, supplies their "A" current; while the "B" potential is supplied by the radio broadcast set.

Tuning is single dial control; and without "hand capacity." **NO PLUG-IN COILS;** a 2-way switch being used for wave-changing. Well made (good soldered joints); pre-tested parts; high-grade components; accurate units; special R.F. (choke), each adapter is tested before shipment. It presents a neat appearance with its variable ratio vernier variable condenser dial for easy tuning; engraved, gold lettered, bakelite panel; numbered, insulated binding posts; aluminum finished power switch; and brown-finished wooden cabinet.

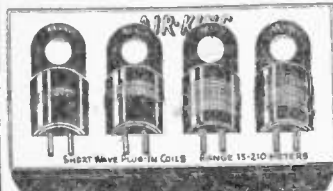
Installed by connecting your aerial to the adapter; and its four binding posts to antenna, ground, and "B" supply on your set. Now insert tubes and plug the power line connection into the light line. Turn on the power switch, tune the broadcast set to its highest wave silent point, with the volume control opened wide, and "go to it!"

Adapter measures 7x10x5 1/2 in. high, overall. Full directions come with it. Shipping weight, 8 lbs.

List Price, \$25.00.

No. 1614 Air King Super-het Converter. **\$14.70**  
YOUR PRICE (without tubes)

## Air King Plug-in Short Wave Coils

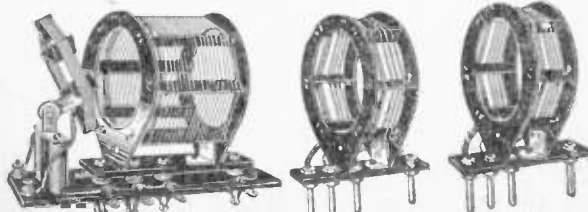


These coils employ regular four pin U.S. tube socket for mounting. Ring function may be identified plainly with coil identification make wave band change — over simple. Four coils in set cover the bands between 15 and 210 meters with a .0001 condenser. Full directions, hook-ups, etc., with set. Shipping weight, 2 lbs.

List Price, \$3.75.

No. 1628 Air King Plug-in Short Wave Coils. **\$1.50**  
YOUR PRICE

## Air King Precision Short Wave Coils

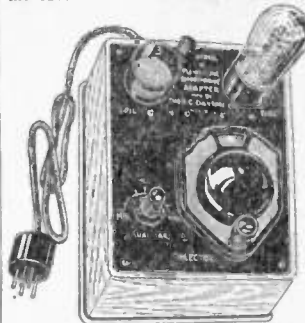


No. 1629 Air King Precision Short Wave Coil Kit.

YOUR PRICE

## Flewelling-Dayton Short-Wave Adapter

This wonderful instrument connects to any A.C. radio set through the simple process of putting into an electric radio receiver tube socket in place of the tube (which must be a type '27, or "heater" tube) the plug which is on the end of its 2-ft. cable; and putting the tube into the tube-socket on the adapter.



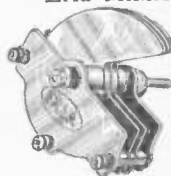
The aerial is to be removed from the broadcast set and connected to the antenna post on the adapter. The two controls are lettered in silver, on the bakelite panel, "Selector," and "Auxiliary." Special plug-in coil No. 1 covers a wavelength band of 17 to 20 meters; coil No. 2, 27-48 meters; coil No. 3, 47-84 meters. (A set of these plug-coil inductions comes with the adapter.) Within this tuning range are over 300 'phone stations (as shown in the "List of Short-Wave Stations" in any issue of SHORT WAVE CRAFT magazine). Stations from every part of the globe received with ease.

This adapter, encased in a neat brown wooden box, 5 1/2 x 7 1/2 x 4 1/2 in. high, overall. Shipping weight, 4 lbs.

List Price, \$15.00.

No. 1613 Dayton Flewelling Short-Wave Adapter. **\$4.95**  
YOUR PRICE (without tube)

## Erla Miniloss S.W. Condenser



A low loss .0001 mfd. variable condenser for use in short wave receivers. A grounded rotor condenser with SFL plates. Single hole mounting. An efficient short wave condenser for the experimenter. Completely nickel plated. Shipping Weight, 1 lb.

List Price \$2.00

No. 1741 Erla S.W. Condenser **\$0.50**  
YOUR PRICE

## New Style Short Wave Plug-In Coils



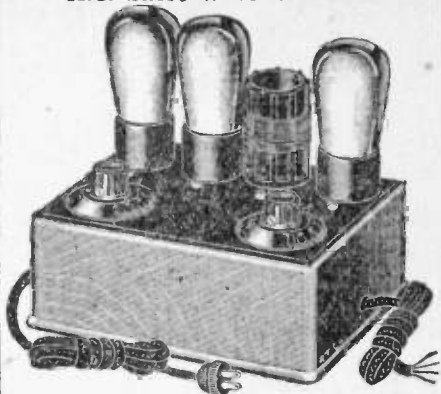
These new style coils are moulded in genuine bakelite to fit U.S. tube sockets. Coil windings come in different colors as indicated in illustration, for quick identification. Smallest and most efficient coils produced in U.S. Wound with special wire to avoid all possible losses.

Set includes four coils to cover range from 15 to 210 meters when used with a .0001 midgap condenser. Just plug coil into U.S. socket. 2 1/2 in. overall by 1 1/4 in. Coil dimension, 2 1/2 x 1 1/4 in. Shipping weight, 1 lb.

List Price \$3.75 Set of Four

No. 1616 Plug-in Coils. **\$1.85**  
YOUR PRICE

## A.C. Short Wave Converter



The thrill of tuning in short waves is yours, almost for the asking, because you can connect this short-wave converter to your broadcast receiver, no matter what type receiver you have, even if it is a Superheterodyne. Tunes from 10 to 200 meters, using only two plug-in coils. These coils, already wound, are supplied with outfit.

This short-wave converter has a built-in filament transformer to heat the three 227 tubes used. All you need obtain from your receiver is a positive "B" voltage, anything from 45 to 180 volts. This voltage is not critical. No molestation of the receiver.

Not only can you tune in short waves, but you can do so more easily than with other systems; since there is no tricky regeneration control, only a single, smooth-operating dial to manipulate. There are no squeaks, no grunting, no body capacity. There is only one tuning control.

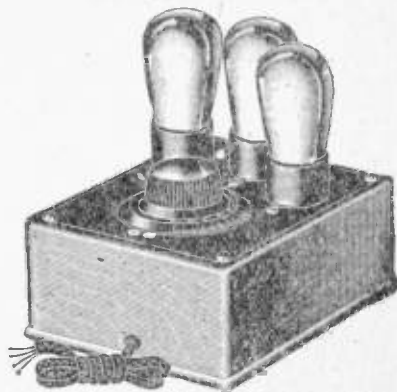
No. 1617—All parts for three-tube short-wave converter, including cabinet of walnut finish, with filament transformer and complete instructions and pictorial diagram (less three 227 tubes). **\$9.50**

YOUR PRICE

No. 1618—Same as above, less filament transformer, operates from 6-volt storage battery and 45 to 180 volts of B battery. All parts, with complete instructions and pictorial diagram (less tubes). **\$7.00**

YOUR PRICE

## Short-Wave Converter



Those desiring to build a short-wave converter at the lowest price on record, but with which excellent results are obtainable nevertheless, may select this model. The culture for the above 227 tubes used may be obtained from an external filament transformer or from a secondary winding of 2 1/2 volts in a power pack where there is enough current to spare. This model has excellent sensitivity; its wavelength ranges from 30 to 110 meters. No plug-in coils are used, but instead a coil switch is used to cover the stated band.

Single dial tuning, no grunting, no body capacity, no squeaks. Leak-condenser detection.

No. 1619—Converter consisting of all parts (less filament transformer) including cabinet panel, pictorial diagram and four-page instruction sheet, pages 1619 (less tubes). List Price, \$7.50. **\$4.85**

YOUR PRICE

No. 1615—Battery model, equivalent in performance to the A.C. model, and of the same external appearance, uses the three 227 tubes with heaters in series across a 6-volt storage battery. All parts (less tubes). List Price, \$7.50. **\$4.85**

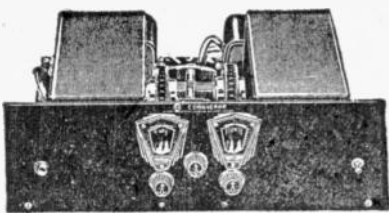
YOUR PRICE

We can supply these converters completely wired, ready to use, at \$2.00 extra.



## I.C.A. Conqueror

An All-Wave Super-Sensitive Receiver  
A.C. and Battery Models



The I. C. A. Conqueror is in every sense of the word, a highly efficient, super-sensitive ALL-WAVE RECEIVER—designed to take the utmost advantage of short wave and broadcast wave lengths.

The highly specialized circuit which makes the above features possible, is one of the tuned R.F. amplifier-tuned regenerative detector type with three stages of mathematically correct and scientifically designed high gain A.F. amplification. Employs no special tubes; 3-27's, 2-24's and 1-45's.

### SIZE AND TYPE ANTENNA NOT CRITICAL

The antenna circuit which is inductively coupled to the first R.F. stage is capacitatively shielded from same, thus preventing the loading effects of the antenna from affecting the efficiency of the tuned R.F. amplifier. This arrangement permits the use of any type or size of antenna as a means of pick-up.

Regeneration in the detector circuit is easily and smoothly controlled by means of a variable condenser, feed-back being accomplished with a minimum effect on the detector tuning and resonance being practically the same whether oscillation is taking place or not.

The audio channel is of the transformer, resistance, transformer coupled type with a self-contained resistance-capacity filter network for the prevention of audio oscillation and so-called "fringe howl". The last audio stage is a single power output with sufficient power to operate either a magnetic or dynamic speaker.

### RANGE 14 TO 600 METERS

The set of 8 plug-in coils furnished with the receiver covers the Short Wave range of 14 to 157 meters. Additional coils our No. 1301 can be supplied, which are designed to cover the Broadcast range of from 110 to 600 meters thus making the receiver a truly universal one.

### ONLY SCREW DRIVER NEEDED TO ASSEMBLE RECEIVER

The construction of the unit is so arranged that the set is partly wired and can easily and quickly be assembled by anyone without technical knowledge. It requires no tools excepting screw driver for the assembly of the receiver. No soldering is necessary.

A set of blueprints, hook-up diagrams, assembly chart, etc., are supplied with each Kit, arranged in a very simple manner so that even a novice who has never assembled a set before in his life can easily and correctly assemble the I. C. A. Conqueror Short Wave Receiver.

### OPERATING REQUIREMENTS

The Battery Model requires 180 volts of B battery, 40 volts of C battery and 6 volts of A battery. This model uses one 171A power tube, two 112A, one 222, and one 201A tubes.

The power supply for the A.C. Model is furnished separately as a specially designed power pack. Specify which model is desired when ordering.

Complete with set of Short Wave Coils. Shipping weight 25 lbs.

No. 1300 I. C. A. Conqueror A. C. Model.  
List Price \$65.00

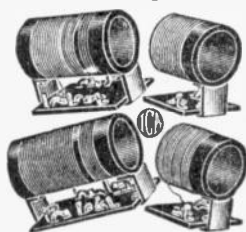
YOUR PRICE **\$35.00**

No. 1302 I. C. A. Conqueror Battery Model.  
List Price \$59.50.

YOUR PRICE **\$35.00**

### I.C.A. Conqueror Broadcast Band Coils

Range 140 to 600 Meters



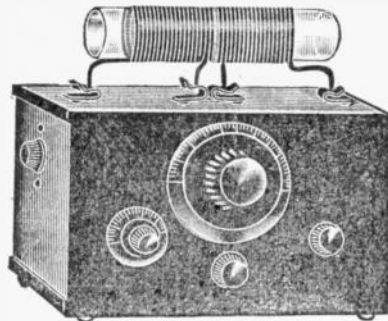
These coils are designed to be used in conjunction with the I. C. A. Conqueror to cover the broadcast band from 140 to 600 meters. They can be employed with any other short wave receiver to increase its wave length range. Are of the plug-in type, wound on 2" diameter heavy wall insulating tubing and are accurately grooved and spaced. Every coil is marked with the wave length range on it.

The set consists of 4 coils; 2 coils for 140 to 300 meters and 2 coils for 300 to 600 meters. Shipping weight 2 lbs.

List Price \$17.50  
No. 1301 I. C. A. Broadcast Band Coils.  
YOUR PRICE **\$6.00**

## World Wide Short Wave Receiver

A One Tube Go-Getter With an Exceptional DX Record.



Here is a remarkably efficient short wave receiver that indiscriminately tunes to wave lengths both below and above the broadcast band as well as those of the broadcast band. It employs a regenerative detector and has unique provisions for controlling plate-grid feed back with a minimum effect upon tuning.

About 15,000 stations may be received, with very little static, from all over the world. By using honeycomb or bank wound coils, this set can be used for tuning up to as high as 20,000 meters.

### RANGE 14 TO 550 METERS

The World Wide short wave receiver is so'd complete with 6 plug-in coils which have an overall tuning range of 14 to 550 meters. Signals come in sharply and with surprising volume and clarity. An efficient, compact, easily operated receiver.

The World Wide receiver is a completely assembled job in an attractive cabinet. Comes equipped with a 1X socket and is suitable for operation with either a 1X-200A, 1X-201A or 1X-112A tube, using 4 dry cells as an A battery. Or you may use a 1X-199 tube, with a 4 1/2 volt C battery; or the new type 230 tube using 2 dry cells as an A battery. This set also requires from 45 to 90 volts of B battery according to the tube used. Shipping weight 11 lbs.

List Price \$16.50

No. 1320 World Wide One Tube S. W. Receiver.  
YOUR PRICE **\$6.45**

The World Wide short wave receiver may also be had with 2 tubes. This model is identical with the one above except that 1 stage of A.F. amplification is added for loud speaker operation. Shipping weight, 12 lbs.

List Price \$21.50

No. 1321 World Wide Two Tube S. W. Receiver.  
YOUR PRICE **\$11.75**

## I.C.A. Conqueror Power Pack

For A. C. Operation



It is well known that the plate, filament and grid voltages necessary to operate a short wave receiver must be absolutely constant in value under all operating conditions. The I.C.A. Power Pack for the Conqueror A.C. receiver is so constructed as to take care of these conditions. This Power Pack uses a 280 Rectifier Tube and is very highly

recommended for the A.C. Conqueror receiver.

This Power Pack is supplied as a separate unit and can also be used with any receiver in which the total plate current is not more than 50 milliamperes. It will furnish plate and filament current for 3-227, 2-245 and 1-224.

The Power Pack is thoroughly filtered and will cause no hum in the loudspeaker. The parts of the I.C.A. Power Pack are mounted very compactly in a neat can finished in dark green crackle. The Rectifier Tube fits inside of the can with special arrangement for adequate ventilation having been provided.

There is a removable cover to the can which allows convenient access to the terminal plate and the Rectifier Tube. The Pack is small and convenient and can be placed inside of the cabinet.

Supplied for 110 volts, 50-60 cycles. Shipping weight, 13 lbs.

List Price \$34.50

No. 3070 I.C.A. Conqueror Power Pack  
YOUR PRICE **\$19.35**

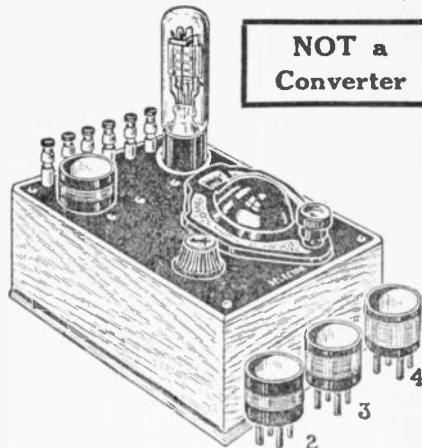
STEP DOWN TRANSFORMER FOR 220 VOLTS  
For 220 volts, 50-60 cycles, a special step down transformer for use in conjunction with I.C.A. Conqueror Power Pack to step the current down to 110 volts is supplied. Shipping weight, 10 lbs.

List Price \$10.00

No. 3071 I.C.A. Step Down Transformer  
YOUR PRICE **\$6.10**

## Around-the-World Short-Wave Set

NOT a  
Converter



A perfect radio short-wave receiver for use between 18 and 200 meters. To put into operation, connect antenna, ground, 45 volt "B" and 2 volt "A" dry cells, and headphones to the posts provided, plug in a type "30" tube, and tune in! The 230 tube was chosen because of its extremely low current consumption and economy of operation. An ingenious circuit makes possible a 4-coil single-winding plug-in design. Provides for a maximum amount of grid-plate feed back which is easily and smoothly controlled by a small variable condenser. A very stable arrangement inuring comparatively great volume.

### Outperforms Many Expensive Receivers.

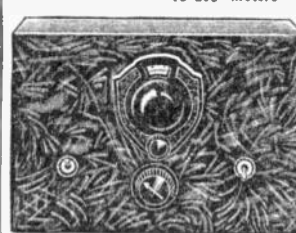
This little instrument has the same sensitivity as many big, shielded short-wave receivers costing ten times as much. A power amplifier may be added for any degree of volume. Complete with 4 plug-in coils. Fine Wood Cabinet. Bracket Panel. Has the vernier dial for precision tuning. Never has a first class short-wave set sold for so little money. This short-wave set measures 5 1/2 x 7 1/4 in. high over all. Shipping weight, 3 lbs.

List Price \$12.50

No. 1666 Around-the-World S. W. Set.  
YOUR PRICE (Less tube) **\$6.25**

## Aero "Super" Short Wave Converter

15-200 Meters



If you have a good broadcast receiver of modern design, the only parts needed to convert this into a short wave super-heterodyne receiver are a mixing tube and an oscillator. The addition of these two units to a good broadcast receiver would provide a short-wave receiving

set which will outperform most any four- or five-tube, tuned-radio-frequency, short-wave set. The average owner of a radio receiver would like to tune in foreign broadcast stations, provided that it could be done without purchasing an expensive short-wave set (which would duplicate in some parts his present receiver) and also without requiring the bothersome plug-in coils. The logical solution to this problem is the superheterodyne converter unit illustrated above which can be connected quickly to the average broadcast receiver and which will give splendid results. Is simple to tune and does not use plug-in coils.

### SIMPLIFIED TUNING—NO PLUG-IN COILS

There is but one tuning control on the entire unit, the other knob being that of the "shorting" switch; i.e. the switch which makes it possible to change the wave-length range without using plug-in coils. The elimination of plug-in coils is affected by tapping the oscillator coil and then shorting the various taps so that the oscillator will cover the necessary frequency range.

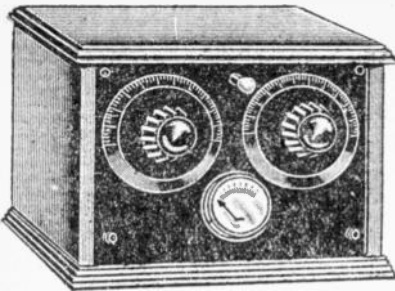
The Aero Converter contains its own filament supply. "B" voltage can easily be obtained from your regular set or you may use a single 45 volt "B" battery. Uses two UX 227 tubes, one as an oscillator and the other as a "mixer". Complete in beautiful two-tone cabinet and high-ratio vernier dial. Available in both A.C. and battery models. Shipping weight, 10 lbs.

List Price \$18.50

No. 1322 Aero Short Wave Converter—A.C. Model  
YOUR PRICE **\$12.50**

List Price \$17.50  
No. 1323 Aero Short Wave Converter—Battery Model  
YOUR PRICE **\$11.50**

## Short Wave Low Power Transmitter



A single tube low power transmitting outfit with a fairly large transmitting range; just the thing to get a station started with. The transmitter is constructed throughout with high quality, low loss parts and can be used for either coil or phone work. If greater power is desired later on, this transmitter can be used as a master oscillator feeding into a stage of push-pull R.F. amplification. When used in conjunction with our No. 3080 A. B. C. Power Pack, a 171A or 112A tube as oscillator, a 226 as speech amplifier and a 215 as modulator, it becomes a low priced, practical radio-telephone outfit of comparatively large transmitting range.

**MAKES AN EXCELLENT SERVICE OSCILLATOR**  
Since the transmitter can be tuned to the broadcast frequencies (use the largest plug-in coil) the serviceman can use it quite advantageously as a service oscillator. It is light and compact enough to be portable. Furthermore, by means of a simple switching arrangement, the ingenious serviceman and experimenter can easily convert the transmitter into a **SHORT WAVE RECEIVER** without further cost. Here, then, are three excellent instruments, a transmitter, receiver, and oscillator, all built into one unit and all at a price within reach of all.

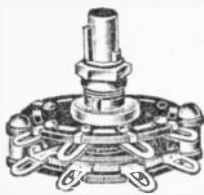
Transmitter comes completely assembled in a beautiful cabinet with a set of plug-in coils, a plate resistor and complete instructions. Shipping weight, 19 lbs.

List Price \$26.50

No. 1326 S. W. Low Power Transmitter.

**YOUR PRICE \$14.75**

## Best Sectional Rotary Switches



Are ruggedly and accurately constructed unit to give exacting service. They may be furnished with any number of sections with either non-shorting or shorting make contacts, or with break contacts; also any combination of these contacts with as many as 9 contacts to each section. All current-carrying parts are well insulated with Bakelite from the shaft, mounting bushing and each other. Made for mounting on any thickness panel and for switching any number of circuits desired. May be used as inductance switches, selector switches; speaker relay switches, and for many other purposes.

## ELIMINATES SHORT WAVE PLUG-IN COILS

One of these switches (the 4 or 5 polar non-shorting type with as many contacts as there are short wave coils) when properly connected will entirely eliminate the necessity and bother of plugging in different coils for different wavelength bands. Merely mount the coils permanently on the chassis, connect the circuit leads to the moving switch arms and the coil leads to their respective contacts, when at a turn of the single knob the various wavelength coils may be switched in and out of the circuit at will. Convenient, compact, efficient.

Switches may be constructed according to your own specifications for switching as many as 600 circuits.

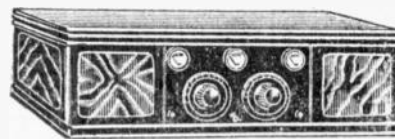
## MOST POPULAR SIZES

No.	No. of Poles	Type*	No. of Contacts	List Price	YOUR PRICE
1964	1	N.S.	4	\$0.85	\$0.55
1965	1	N.S.	9	1.10	\$0.70
1966	1	S	4	.85	\$0.55
1967	1	S	9	1.10	\$0.70
1968	2	N.S.	4	1.45	\$0.90
1969	2	N.S.	9	1.95	\$1.20
1970	2	S	4	1.45	\$0.90
1971	2	S	9	1.95	\$1.20
1972	3	N.S.	4	2.30	\$1.41
1973	3	S	4	2.30	\$1.41

\*Note: N.S.—Non-Shorting; S—Shorting.

## Complete Phone and C. W. Transmitter

15 to 30 Watts



This transmitter is of the tuned plate-tuned grid oscillator type with provision for crystal control. It is wired for one or two 1X 210 tubes, one or two 250's as modulators and two stages of speech amplification. This circuit hook-up is much favored because of its stability of operation and all around efficiency. Has an approximate range of 1000 miles as a radiophone and 4000 miles as a continuous wave transmitter. A reasonably priced, medium powered, high frequency telephone and telegraph transmitting unit that will full meet the requirements of the average amateur.

**COMPLETE WITH A STROMBERG-CARLSON MICROPHONE**

Transmitter comes completely assembled and wired in a beautiful two tone walnut cabinet with a Stromberg-Carlson microphone and a set of eight coils, and can be placed anywhere including the living room. Shipping weight, 25 lbs.

List Price \$48.50

No. 1325 Complete Phone and C. W. Transmitter.

**YOUR PRICE \$39.50**

## Flexi-Unit Adapters



'01 Adapter Plug  
Provides for short wave adaptation and use of unit as R.F. pre-amplifier or booster with battery receivers or A.C. receivers employing a '26 type tube in 1st R.F. socket. Shipping weight, 1/2 lb.

List Price \$2.00

No. 1869 Flexi-Unit '01 Adapter Plug  
**YOUR PRICE \$1.30**

## '27 Detector Adapter Plug

Provides for short wave reception with A.C. receivers employing either '27 or '24 type tubes in detector socket. Shipping weight, 1/2 lb.

List Price \$2.50

No. 1870 Flexi-Unit '27 Detector Adapter Plug  
**YOUR PRICE \$1.60**

## '27 R.F. Adapter Plug

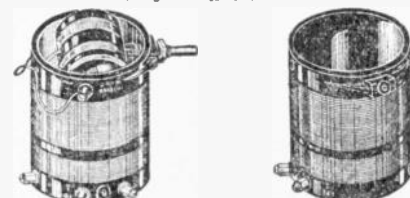
Provides for use of unit as R.F. pre-amplifier or booster with A.C. receivers employing a '27 type tube in 1st R.F. socket. Shipping weight, 1/2 lb.

List Price \$3.00

No. 1871 Flexi-Unit '27 R.F. Adapter Plug  
**YOUR PRICE \$1.92**

## All-Wave Coil Kit

Range 25 to 550 Meters



A newly developed all-wave coil kit comprising a 3 circuit tuner and an R.F. coil, both having tapped secondaries, which permits you to enjoy SHORT WAVE AND BROADCAST PROGRAMS. By means of a simple switching switch arrangement, a portion of the secondary coils may be cut out of the circuit thereby making it resonant to the higher frequencies i.e. lower wave lengths.

Wound on sturdy Bakelite forms provided with suitable soldering lugs. The tickler coil of the tuner revolves smoothly on its own Bakelite form, at a predetermined distance from the secondary, thereby permitting very fine regeneration control. Kit may be had for use with either .00035 or .0005 mfd. condenser. Specify which when ordering. Our No. 1970 Best Sectional Rotary Switch is excellently suited for use with this kit. Either of these units may be bought separately. Shipping weight, 2 lbs.

List Price \$10.00

No. 2075 All-Wave Coil Kit  
**YOUR PRICE \$1.50**

No. 2076 All-Wave 3 Circuit Tuner  
**YOUR PRICE \$0.90**

No. 2077 All-Wave R.F. Coil  
**YOUR PRICE \$0.75**

## G. W. Walker Flexi-Unit

The Unit of a Dozen Uses At the Price of One



The purpose of the Flexi-Unit is manifold. It is all that its name implies. The unit will function as a REGULAR RECEIVER and by changing the plug-in coil the SHORT WAVE STATIONS may be heard. Attaching the unit to your receiver as an extra stage of tuned circuit, the frequency will permit greater volume, distance and selectivity. This use is commonly referred to as a PRE-AMPLIFIER OR R.F. BOOSTER. When plugged in to a socket of your receiver, the audio amplifier is utilized and greater volume results. When tuning the short wave stations, its use as an OSCILLATOR will permit the radio service man to set up a signal when repairing a receiver to determine whether the set is in operating condition. Elusive stations can be tuned in by adjusting the Oscillator to the frequency of the broadcast station and by tuning the receiver to the signal set up by the Oscillator the station desired will be heard if within range of the receiver. As a WAVE METER its use will be quite valuable. By inserting a crystal and cat whisker at the terminals provided, a highly efficient crystal set will result.

## Not Restricted to any One Type of Tube

An exclusive feature of the Flexi-Unit is that most any standard type tube may be used. Some of the most popular types are A. C. 226, A. C. 237, 200-A, 201-A, 112-A, 171-A, 210, UX 199 and 222 D. C. Screen Grid. When using the unit for short wave tuning with an A.C. receiver, our No. 1870-27 Detector Plug will permit convenient and immediate connection of the Flexi-Unit to the receiver.

The fact that your present receiver may be broad in tuning, weak in volume on the far distant stations, harsh in tonal quality, or otherwise incapable of rendering general satisfaction, does not indicate that a new receiver need be purchased. While there have been many so-called "improvements" in the number and latest design of receivers, a close inspection will reveal there has been only another stage of radio frequency added and that the original circuit remains the same. To improve the performance of your receiver to compare with, or even excel, the "latest thing" you need only plug in the Flexi-Unit to one of the tube sockets.

The Flexi Unit is put up in a beautiful one piece metal shield box with gold colored stucco finish. Measures 5 1/2" x 8 3/4" x 3", light weight and compact. Sold with plug in coils to tune from 15 to 500 meters, and a complete set of detailed instructions. Shipping weight 8 lbs.

List Price \$16.00

No. 1310 G. W. Walker Flexi-Unit.  
**YOUR PRICE \$10.26**

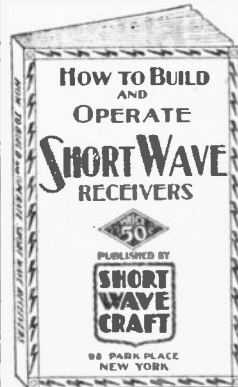
## AND NOW!

The greatest book of its kind ever published. **HOW TO BUILD AND OPERATE SHORT-WAVE RECEIVERS** is the largest and most up-to-date book on the subject ever put between two covers.

The book has been edited and prepared by the editor of **SHORT-WAVE CRAFT**, and contains a wealth of material on the building and operation, not only of typical SHORT-WAVE RECEIVERS, but **SHORT-WAVE CONVERTERS** as well.

Dozens of short wave sets will be found in this book, which contains hundreds of illustrations; actual photographs of sets built, hook-ups and diagrams galore.

**WE SAY — AND REPEAT IT — THAT EVERYONE SHOULD HAVE THIS BOOK.**



Nothing like this has ever been published before.

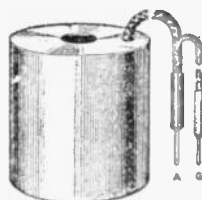
The book comes with a heavy colored cover, and is printed throughout on fine-class bound paper. No expense has been spared to make this the outstanding volume of its kind. The book measures 7 1/2 x 10 inches. Issued by the publishers of **SHORT-WAVE CRAFT Magazine**. This alone will be your guarantee that it is a really worthwhile publication.

No. 830 How to Build and Operate Short-Wave Receivers.  
**YOUR PRICE, PREPAID \$0.50**



## NEW Service Men's Trouble-Shooting Coil

Localizes All Receiver Defects



Designed for the serviceman to use in localizing R.F. troubles. The preferred use is in conjunction with an oscillator for supplying a signal to the coil which is induced into the grid of the tube when the exploring coil is placed around the tube. The process of localizing R.F. tuner faults with the exploring coil is extremely simple and reduces time to a minimum. Trouble is traced to the part of the circuit by eliminating other parts of the circuit where it is found that the induced signal from the exploring coil is satisfactory.

In use, the exploring coil is connected to the oscillator by means of the shielded wire, using the shielding of the wire for the oscillator ground connection. Signal will be heard in the set speaker or noted on output meter.

### TROUBLE SHOOTING PROCEDURE

Place exploring coil over the first R.F. tube. If no signal is noted the source of trouble is not to be found in the aerial and ground, or the secondary winding of the first R.F. transformer. Proceed to the next R.F. stage. If no signal results here the tuning trouble will not be located in the circuit preceding, or the grid circuit of the second R.F. stage.

If in the third R.F. stage a signal is noted the trouble will be found in the grid circuit of that tube, or in the plate circuit of the second R.F. tube. This procedure is followed through the different R.F. tubes until a signal localizes trouble in the grid circuit of the tube on which test is made, or in the plate circuit of preceding tube which may be a band pass. Voltage tests should be made with a ret. tester. Without correct voltages as determined from servicing manuals R.F. troubles cannot be overcome to give the right tuning qualities to the set.

### FOR PEAKING INTERMEDIATES OF SUPERHETS

For peaking or flat topping the intermediates of super-heterodyne circuits the exploring coil may be used in the same manner as for R.F. circuits by inducing a signal into the stages preceding the tube to which the exploring coil is applied.

The exploring coil may be used in connection with an output meter for determining the amount of gain and bringing to resonance parts of R.F. circuits. This method will localize trimming condenser trouble with a minimum of labor involved. Other uses will readily suggest themselves to the experimenter in applying the exploring coil for diagnosing R.F. circuit and tube troubles.

Both coil and connecting wire are completely shielded. A thoroughly useful, and dependable device no serviceman can afford to be without. Shipping weight, 1 lb.

List Price \$3.50

No. 1875 Service Men's Trouble Shooting Coil

YOUR PRICE **\$2.05**

## Improved Neutralizing and Compensating Tools

The main purpose of this handy set of tools is to accurately adjust trimmer or neutralizing condensers without being hindered by troublesome body capacity. The highly sensitive modern receivers of today are so critically balanced that the comparatively minute capacity of .00001 mfd. is sufficient to cause them to squeal and oscillate. Now when you take into consideration the fact that body capacity (which always results through the use of ordinary screw drivers and wrenches) is at times twice and even three times this value, you immediately realize how essential these tools really are.

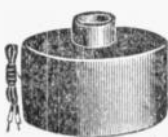
This set of improved tools consists of a small, special screw driver, a 3/4" nut wrench and a key slot all on one piece of insulated tubing. This unit screws into a second unit which is again equipped with a 5/16" nut wrench and a holding clip. All in all, the entire set has the appearance and compactness of an ordinary fountain pen and may be carried around as such. Measures 6 1/2" long by 7/16" in diameter. Shipping weight, 4 oz.

List Price \$2.50

No. 1880 Improved Neutralizing and Compensating Tools

YOUR PRICE **\$0.85**

## Baldwin RIVAL Speaker Unit



A loud speaker unit bearing the world famous Baldwin mark. Designed for use with horn type speakers or with old style phonographs. A sturdy unit with many uses. Complete with cord. Shipping weight, 1 lb. POSITIVELY LOWEST PRICE THIS UNIT HAS EVER BEEN SOLD.

No. 1524 Baldwin "Rival" Unit.

YOUR PRICE **\$0.50**

## Eiseman Headsets



A highly popular head set with tone-matched, adjustable, units. Constructed of light aluminum alloy with double magnets and double poles. Good for DX work. Complete with 6 ft. cord. Shipping weight, 2 lbs.

List Price \$4.00

No. 1679 Eiseman Headsets  
YOUR PRICE **\$1.05**

## Genuine Brandes Matched Headset



An accurately matched set of head phones, each unit consisting of high flux magnets surrounded by field windings of 2000 ohms resistance. Ruggedly constructed of light weight metal and highly polished imitation Bakelite ear caps. Can be worn for hours at a time without fatigue. Excellently suited for DX work. Complete with 6 ft. cord. Shipping weight 2 lbs.

List Price \$6.50

No. 1678 Brandes Matched Headset

YOUR PRICE **\$1.58**

## Little Gem Midget Cone Speaker



Primarily designed to be used as an advertising novelty and as a decorative addition to a regular speaker; this Little Gem works surprisingly well for one of its size. It has all the features of regular cone speakers; adjustability of armature, flexibility of paper cone and universality of mounting bracket. Measures barely five inches in diameter and 1 1/2 inches in depth. A beautifully antique-finished cone useful and pleasing ornament to have around. It will afford you a considerable source of amusement and satisfaction. Shipping weight, 2 lb.

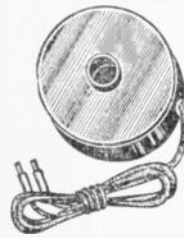
List Price \$2.00

No. 1552 Little Gem Midget Cone Speaker. **\$0.95**

YOUR PRICE

## Nathaniel Baldwin Units

*Nathaniel*  
**BALDWIN**  
RADIO PHONES



This is the world famous standard for use with horn type speakers or phonograph sound chamber. All units completely enclosed in metallic shell. No better units made. Shipping weight, 1 lb. Overall dimensions, 3x3x2".

No. 1521 Baldwin H-1 Unit. List Price \$5.00.

YOUR PRICE **\$0.75**

No. 1522 Baldwin Lyric Unit. List Price, \$6.00.

YOUR PRICE **\$1.40**

No. 1523 Baldwin Standard Unit. List Price, \$6.00.

YOUR PRICE **\$1.20**

No. 1524 Standard Phono-Speaker Unit with felt bottomed metal base.

YOUR PRICE **\$1.00**

## Wave Trap and Selectifier

NO TUBES REQUIRED



An extremely important development in radio accessories is this highly efficient device. It comprises a doubly tuned band pass filter with 10 kc. band width and primarily enables cutting out an interfering station. It is thus particularly important to those who live near a broadcasting station. It kills off the interferer mercilessly! Besides this rejection feature, it also has an acceptance characteristic, a few dial degrees to the right, permitting you to build up the volume of weak stations, and bring in far greater distance, than you ever thought possible with your set. Many persons own sets excellent in every respect, except for insufficient selectivity. Why not capitalize on the heavy investment already made, by installing a selectifier, and rid yourself forever of interference from other stations, due either to crosstalk or cross-modulation?

There are only three connections to make (1) Remove the aerial from the antenna post of your receiver and connect it instead to the (left) antenna wire of the selectifier; (2) Connect a wire from the ground of your set to the ground wire (center) of the selectifier; (3) Connect to the output wire of the selectifier (right) with a wire to the vacated antenna post of your set.

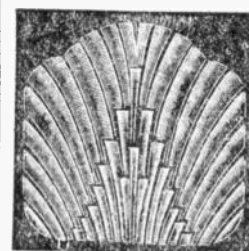
Sold completely wired, ready to use in an attractive 7"x10" walnut-finished cabinet. Shipping weight, 6 lbs.

List Price \$15.00

No. 1494 Wave Trap and Selectifier. **\$9.50**

YOUR PRICE

## Speaker Grill Cloth



Exceptionally well woven metallic fabric cloth 10 1/2" square for gracing speaker grill openings of both regular and midget type consoles and cabinets. One set in place it will neither sag nor stretch but will retain its same fine appearance throughout the life of the console. An attractive futuristic design is permanently woven into the fabric with silver-colored silk thread. Lends beauty and charm to any cabinet and room in which it may be utilized.

List Price \$0.50

No. 1569 Speaker Grill Cloth.

YOUR PRICE **\$0.20**

## Exponential Trumpets

3 1/2 Ft. Trumpet

These trumpets when used in conjunction with loud speaker or phonograph units, especially those of the magnetic motor-drive type (as our Baldwin Rival Unit No. 1520) make excellent directional, power speakers of exceptional tone quality. Bell 2 1/2 in. diameter, 42 in. long. Acoustically correct. Shipping weight, 8 lbs.

List Price \$20.00

No. 1543 3 1/2 ft. Exponential Trumpet **\$11.75**

YOUR PRICE

List Price \$25.00

No. 1544 Bent and Water-proof Model **\$14.70**

YOUR PRICE

## 6 FT. EXPONENTIAL TRUMPET

For indoor or outdoor application. Will carry for a distance of about 2,000 ft. Mounting rings included.

List Price \$58.00

No. 1545 6 Ft. Exponential Trumpet **\$29.35**

YOUR PRICE

List Price \$62.00

No. 1546 Bent and Water-Proof Model **\$33.75**

YOUR PRICE

# TELEGRAPH KEYS

## Junior Key

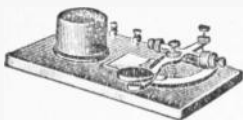


A low-power sending key constructed on a heavy black enamel base. Has coin silver contact and nickel plated lever. Key is set on a laquered mahogany base board provided with two brass binding posts. Shipping weight, 2 lbs.

List Price \$2.25  
**YOUR PRICE \$1.50**

No. 2375 Junior Key  
**YOUR PRICE**

## Code Practice Set



A simple wireless code practice set for beginners. Just the instrument to get started with. Equipped with a high buzzer which emits a note exactly similar to real wireless signals. Requires only a 3 volt battery for operation. The code is printed on a little brass plate fastened to the base. Key is made of solid brass and is mounted on a beautifully finished base board together with the buzzer and three brass binding posts for battery and ear phone connections. Shipping weight, 2 lb.

List Price \$3.40  
**YOUR PRICE \$1.95**

No. 2377 Signal Practice Set  
**YOUR PRICE**

## Standard Wireless Keys



The most popular key for amateur transmitting stations. Designed for larger capacity radio work. The arm, base, and supporting posts are constructed of heavy cast laquered brass. Contact points are of coin silver and will not arc. Are available in three different sizes of contact points. Shipping weight 1 1/2 lbs.

No.	Size of Contacts	List Price	YOUR PRICE
2371	3/16"	\$3.50	<b>\$2.00</b>
2372	1/4"	3.70	<b>\$2.50</b>
2373	3/8"	3.90	<b>\$2.60</b>

## Dual Contact Key



Has two additional back stop contacts which make this key invaluable for break-in systems where the auxiliary contacts can be used to operate the break-in relay. Ideal for transmitters where it is necessary to open, instead of close, the keying circuit in order to key the transmitter. In this case only the back-stop contacts are used. Shipping weight, 1 1/2 lbs.

List Price \$4.00  
**YOUR PRICE \$2.70**

No. 2374 Dual Contact Key  
**YOUR PRICE**

## Sematic Key



This is a professional key of latest design with a minimum number of adjustments. Can be used as a double action or semi-automatic key. Pressure on one side of the lever produces an even unbroken train of dots; on the other, the dashes. Code transmitted with this instrument is legible at much greater speeds, since the characters are perfectly formed. Eliminates fatigue and telegraphers paralysis. Contact points are heavy enough to use in most radio circuits without relay, although one should be used if current to be interrupted is very high.

Made of nickel plated brass parts on a heavy, black cast base. Is easily mastered by anyone in a short time. No trouble to put in circuit in place of the old style key. Shipping weight, 3 lbs.

List Price \$18.00  
**YOUR PRICE \$12.15**

No. 2376 Sematic Key  
**YOUR PRICE**

## Legless Key



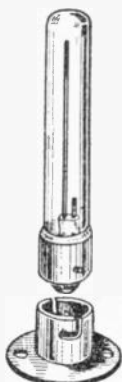
Polished and laquered brass base, nickel-plated lever, coin silver contacts. Has also make and break switch. This type of key is used exclusively by Western Union.

List Price \$3.00  
**YOUR PRICE \$1.98**

No. 2370 Legless Key  
**YOUR PRICE**

## NEW!

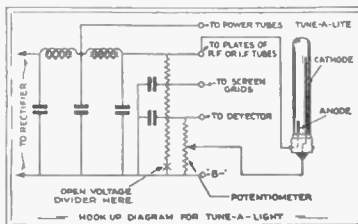
Glow Brilliantly When Set is EXACTLY Tuned to Desired Station



The heart of this unique tuning device is a specially designed neon tube resonator which is energized by the incoming broadcast signal. As the dial is turned, approaching a signal, a rising column of red neon light reaches its brightest point just as that station is "tuned in on the button." This unique, visual method of tuning insures absolute resonance at all station frequencies. ENTIRELY INDEPENDENT OF VOLUME CONTROL and audio channel of receiver. Even with the volume control turned to its minimum setting the automatic Tune-A-Light works just the same.

### WORKS AUTOMATICALLY—EASILY INSTALLED

The Tune-A-Light, once installed does not have to be adjusted, or regulated in any way whatsoever—works entirely automatically—may be connected to all types of receivers in any of a variety of ways, the simplest and most efficient of which is pointed here. Merely open the last section of the power pack voltage divider at "B" end, shunt a potentiometer of equal value across the opened terminals and connect the Tune-A-Light cathode to the moving arm of the potentiometer. Then connect the anode to the R.F. or I.F. voltage tap and the Tune-A-Light is ready for operation. Adjust the potentiometer for best results.



### EXCELLENT OPPORTUNITY FOR SERVICE MEN

The Tune-A-Light makes a pleasing, novel adjunct to any modern radio receiver; this of course, aside from its material advantages outlined above. Service men can make a pretty penny installing this unique development on receivers which do not already have them. The operation is simple. Merely cut a longitudinal slit in the front panel, cover with a strip of transparent material (oiled paper will do) from the inside and then mount the neon tube directly behind the slit and paper. Now, at the exact moment when the receiver is accurately tuned to a station the Tune-A-Light will flare up and inform you of that fact. Or you may use the Tune-A-Light in place of the ordinary pilot light in which case the tuning dial will light up only when a station is accurately and critically tuned in. The call numbers of the various stations may then be logged directly on the tuning dial thus doing away forever with the strain of remembering "kilocycles" and "wave lengths". When the light flashes—there's your station.

A BOON TO SHORT WAVE RECEPTION

Many short wave fans, experimenters and amateurs have already recognized this clever device as an invaluable aid in tuning. Short wave stations tune in very sharply and unless a high ratio vernier dial is employed may be entirely passed by unnoticed. With Tune-A-Light however, the flash of the light, each time a station is accidentally by-passed, no matter how slight or how momentarily is easily discernible. Measures 3 1/2" long x 1/2" in diameter. Made only to engage bayonet type sockets. Shipping weight, 1/2 lb.

List Price \$5.00  
**YOUR PRICE \$2.50**

No. 645 Tune-A-Light Resonance Tube  
**YOUR PRICE**

List Price \$0.50  
No. 1858 Bayonet Socket for Above  
**YOUR PRICE \$0.30**

## NEW TELEVISION CRATERTRONS HOT CATHODE TYPE

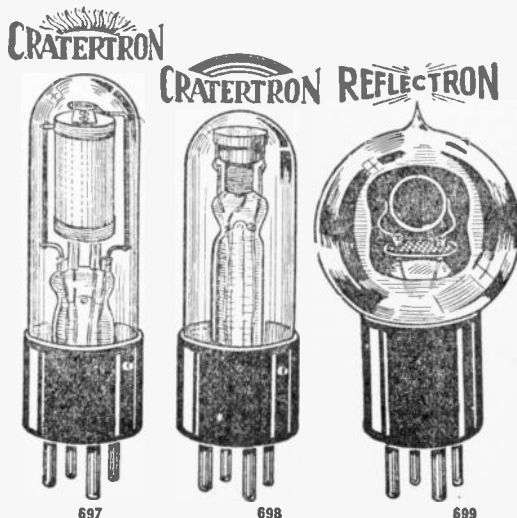
The new sensational Crater television tube has been chosen from hundreds of experimental tubes and we offer it as the most efficient television light source obtainable at the present time. The cathode is indirectly heated allowing A.C. heating current from the power transformer. Wherever practical the heater voltage is 2.5 volts to conform to standard. In each case the cathode surface area has been chosen to adequately maintain the required arc current without deterioration. Maximum heat dissipation is obtained by the use of large radiating surfaces. The arc path is shortened to a minimum to assist efficient modulation.

These lamps can be supplied with crater size ranging from .020" to .250". The arc currents range from .050 amp. to 1.0 amp. Larger lamps can be supplied on special order.

The hot cathode type lamp possesses an extremely low impedance—about 50 ohms, so, unless satisfactory output tubes or step down transformers can be obtained, we suggest the use of a separate source of exciting energy. In this way the amplifier output can be used only for modulation and satisfactory coupling can be designed. The heater voltage depends on the arc current desired. It is rated at about 50 watts per ampere.

List Price \$7.50  
No. 697 Television Cratertrons, Hot Cathode Type  
**YOUR PRICE \$5.65**

## Latest Developments in Television Tubes—Hot from the Laboratory



### COLD CATHODE TYPE

This type can be supplied with any size crater from .010" to .250". Great care has been exercised to confine the glow to the useful emitting area. The design has been chosen to obtain maximum light under the most convenient conditions of voltage, current, impedance, modulation, etc. The gas pressure is optimum for each crater size. We recommend this type for images up to 8" square. These lamps operate satisfactorily in the output of 245's and will stand up to 50 milli average current. When ordering state size of crater desired and output power contemplated.

List Price \$5.00  
No. 698 Television Cratertrons, Cold Cathode Type  
**YOUR PRICE \$3.75**

### NEW "REFLECTRON" RECEIVING TUBE

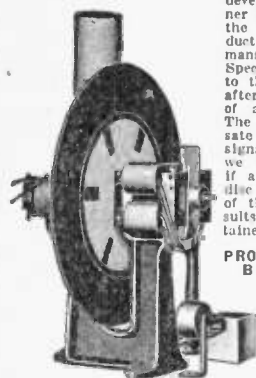
This is an improved type of receiving lamp for small image reproduction. The Spherical tube is coated inside completely with an alkali metal which functions as the cathode. A 1" square window is provided. Since the anode is centrally located, the electrical field is symmetrical assuring equal current density distribution over the entire cathode. Due to the spherical shape **USE CAN BE MADE OF THE REFLECTED LIGHT WITHOUT INTRODUCING DISTORTION.** The effective cathode area is many times that of the usual plate type allowing the use of higher currents; 50-60 milli can be used successfully on this type. The modulation is excellent. The impedance is comparatively low—about 600 ohms. This type has the highest frequency response of any so far developed. Special lamps of this kind can be supplied with windows up to 3".

List Price \$3.50  
No. 699 Reflectron Neon Tube  
**YOUR PRICE \$2.65**



# THE LATEST AND BEST IN TELEVISION

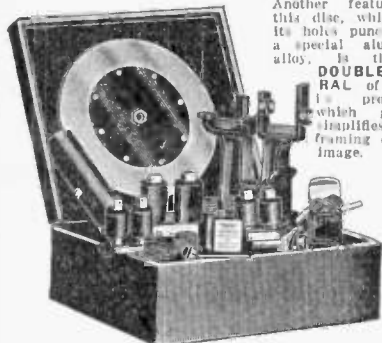
## "See All" Television Scanner Kit



One of the most highly developed television scanner kits recently placed on the radio market. A product of unexcelled workmanship and engineering. Special care has been given to the scanning disc which after all is, the real heart of any television receiver. The neon lamp will pulsate with the television signal currents, that we know beforehand, but if a poorly made scanning disc is revolved in front of the neon tube, poor results will naturally be obtained.

### PRODUCES EXCELLENT BRILLIANT IMAGES

One of the reasons for these extra fine images is that the holes in the disc are **SQUARE**, not round, thus providing a far greater illumination. Another feature of this disc, which has its holes punched in a special aluminum alloy, is that a **DOUBLE SPIRAL** of holes is provided, which greatly simplifies the framing of the image.



### COMPRISES "PHONIC" AND EDDY CURRENT MOTORS

The "See-All" scanning disc is both dynamically and statically balanced; the scanning holes measure .0085 inch on a side. The "See-All" scanner kit comprises a particularly fine disc, 12 inches in diameter, and which also comprises the six-toothed laminated iron "phonic motor" wheel and copper disc for the eddy current and phonic wheel motors.

### VISUAL SYNCHRONIZING CONTROL

A stroboscope disc, containing equally spaced black marks on it is furnished, and when viewed in the light from a 110 volt 60 cycle incandescent lamp, the black marks appear stationary when the disc is rotating at 1,200 r.p.m.

The above illustration shows the "See-All" scanner assembled from the kit. Kit comes complete with all iron cores and windings for both driving and phonic wheel motors, scanning disc shaft with self-aligning bearings, speed regulating rheostat, by-pass condenser, neon tube socket, support and shield, stroboscope disc, instruction book and assembly blueprints, together with scanning disc and phonic wheel. Instruction book and blue prints, showing just how to assemble the scanner and giving data on a short wave television receiver as well as furnished with the kit.

List Price \$19.75

No. 2400 "See All" Television Scanner Kit

YOUR PRICE

**\$12.95**

## Benjamin Cle-ra-Tone Radio Sockets



Shock absorbing, non-microphonic — gives longer life and protects the tube from sudden impacts which would otherwise cause microphonic noises or "tube noises." No better socket made. Moulded in Bakelite. Last a lifetime. Size, 2x2x1 1/4". Shipping weight, 1/4 lb.

List Price, 75c.

No. 9040 With Mounting Base, 4 prong.

YOUR PRICE

**\$0.33**

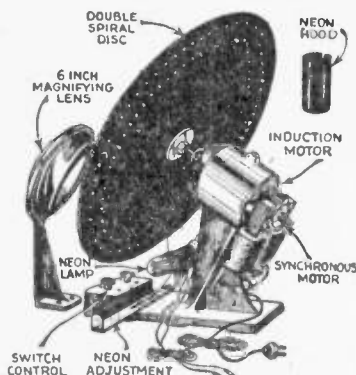
No. 9036 Type Y for 5 prong.

YOUR PRICE

**\$0.38**

## Pioneer "Square-Hole" Televisor

120 Scanning Holes in Double Spiral  
Fully Assembled — Ready to Use



This Televisor is of radically new design, employing motor operating on 110 volts, 60 cycle, for bringing the disc up to speed and after the disc is brought up to speed, a switching device cuts out the motor and throws in the synchronizing motor, which automatically keeps the disc in synchronism with the television signals. **THIS MOTOR IS NOT SUBJECT TO LINE FLUCTUATIONS WHEN IN SYNCHRONISM, THUS ENABLING THE PICTURE TO BE HELD STEADILY IN THE FRAME** without the trouble experienced with the eddy current type motors. Extremely quiet in operation, runs with practically no vibration.

This machine employs a 16-inch diameter disc, with 120 holes, which makes possible a larger picture than ordinarily given by this type of apparatus. **THE HOLES ARE DOUBLE-LINED, MAKING THE APPARATUS SELF-FRAMING. SQUARE HOLES ARE USED TO BRING OUT THE SHARPER DEFINITION.**

### EMPLOYS 6" MAGNIFYING LENS

A large 6 inch magnifying lens is used, mounted in a suitable holder for enlarging the picture. This complete apparatus employing as it does a 6 inch lens **GIVES A PICTURE TWO TO THREE TIMES LARGER, WITH GREATER DETAIL THAN ANY OF THE TELEVISION UNITS NOW ON THE MARKET.**

The illustration shows that the scanning disc and the magnifying lens are both **PLACED AT AN ANGLE FROM THE VERTICAL, AND THE NEON LAMP IS VIEWED FROM THE LOWER PART OF THE DISC INSTEAD OF THE TOP.** This makes possible a **PERFECT VIEW OF THE PICTURE** without necessitating stooping and stretching as is the case with other makes of Televisors. It also allows a smaller and more compact structure.

The frames used for mounting are heavy castings, which help to do away with vibration, and they are so constructed as to make a very substantial outfit for use as illustrated or for mounting within a cabinet. This outfit gives bigger and better pictures with more light and clear definition.

Shipping weight, 15 lb.

List Price \$32.50

No. 3914 Pioneer Square-Hole Televisor. **\$17.60**

Neon Receiving Tube — \$1.95 extra  
6" Magnifying Lens — \$5.00 extra

## Moulded Bakelite Sockets

A well moulded bakelite socket for the set builder and service man. Arranged for sub panel wiring. Specify whether UX or UY (4 or 5 prong) socket is desired. Shipping weight, 1/4 lb.

List Price, 50c.

No. 1850 Moulded Bakelite Socket.

YOUR PRICE

**\$0.15**

## Na-Ald Wafer Sockets

The same type socket as is found in the finest commercial radio receivers. Color coded centering plates make for easy insertion of the tube and identification of the desired socket. They are obtainable in the following markings, 286, 227, 224, 245. Specify which when ordering. Shipping weight, 1 oz.

No. 1851 Na-Ald Wafer Sockets.

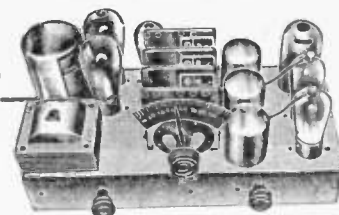
YOUR PRICE

**\$0.06**

## "See-All" Screen-Grid Hy-Mu Television Receiver

Fully Assembled  
— Ready to Use.

Guaranteed for Efficiency



Here is a low priced, compact, efficient receiver which is available to the technician as well as the amateur and is **PRIMARILY DESIGNED FOR RECEPTION OF TELEVISION.** Not a make shift; not an "all-wave" receiver with only fair efficiency in the television band, but **A PERFECTED SIX TUBE INSTRUMENT OF UP TO THE MINUTE CONSTRUCTION, INCLUDING PLATE DETECTION AND VARIABLE MULTITUDES.**

The most important characteristic required of a receiver designed for television operation is **ADEQUATE POWER OUTPUT TO COVER THE ENTIRE BAND OF TELEVISION FREQUENCIES.** This factor is achieved in the new "See-All" television receiver through the use of **PLATE DETECTION WHICH DEFINITELY ELIMINATES AN EXTRA STAGE OF AUDIO AMPLIFICATION WITH ITS INHERENT DEGREE OF DISTORTION.**

Numerous tests indicate this design to be particularly efficient. For instance, this receiver, located in the heart of New York City daily reproduced image transmissions from Passaic, Boston, Camden, Washington, D. C. and other points.

### A COMPLETE TELEVISION RECEIVING OUTFIT

This television receiver when used in conjunction with the **PIONEER TELEVISOR** makes up this complete and **COMPLETE AND HIGHLY EFFICIENT OUTFIT FOR THE RECEPTION OF TELEVISION IMAGES**—an inexpensive outfit with which to get started in the television field. Dimensions 9 x 12 x 7 1/2" high. **EASILY INSTALLED IN ANY HANDY CABINET WHICH CONTAINS A BROADCAST RECEIVER.** Requires six tubes, 2-235, 1-245 and 1-280. Shipping weight 20 lbs.

List Price \$32.50

No. 3913 "See-All" High-Mu Television Receiver.

YOUR PRICE, less tubes

**\$24.75**

## Neotron Caesium Photo-Electric Cells

### Latest Development

The new Neotron Photo-Cell is a recent development in its field, employing a special caesium compound as the light-sensitive element. An absolutely stable, non-microphonic unit, which will operate continuously over a long period of time without voltage adjustments of any kind. Possesses high sensitivity, responding instantaneously to all light impulses. A decided advantage over the old potassium type cell.

Available in two different sizes. Shipping weight, 1 lb. The bases are of standard UX type.

List Price \$10.00

No. 640 Neotron Caesium photo-cell, 2-1/16" diam.

YOUR PRICE

**\$3.75**

No. 641 Neotron Caesium photo-cell, 2-5/16" diam.

YOUR PRICE

**\$4.50**

## Latest Television Scanning Lens Disc

60 Lenses—12 3/4" Disc  
Here is a low scanning disc which is engaging the attention of all television enthusiasts and experimenters — a disc which affords an image of approximately 8" square when used in conjunction with one of the new Neotron tubes. Each lens is accurately ground to 7/16 of an inch and is optically focused by a special device to .0002. The disc itself is of non-corroding duralumin and is 12 3/4" in diameter. An excellent unit around which to construct an ultra-efficient, up-to-the-minute television-scanning projector, enabling the entire family to "look in" at the same time. Each unit is guaranteed against all mechanical defects. Shipping weight 10 lbs.

List Price \$20.00

No. P3999 60 Lens Scanning Disc.

YOUR PRICE

**\$16.80**

RADIO TRADING COMPANY, 25 WEST BROADWAY, NEW YORK, N. Y.

57

A black and white photograph of a spool of RTCO Insulated Cable. The spool is made of many turns of thin wire. A magnifying glass is positioned to the right, focusing on a section of the cable where the insulation has been stripped back, revealing the bare metal conductors inside.

No.	Size	YOUR PRICE	No.	Size	YOUR PRICE
2018	18	\$0.40	2518	18	\$0.45
2020	20	.45	2520	20	.55
2022	22	.55	2522	22	.70
2024	24	.60	2524	24	.75
2026	26	.70	2526	26	.85
2028	28	.75	2528	28	1.10

2318	18	\$0.75	2818	18	\$0.85
2320	20	.80	2820	20	1.00
2322	22	.90	2822	22	1.15
2324	24	1.00	2824	24	1.30
2326	26	1.10	2826	26	1.45
2328	28	1.20	2828	28	1.70

A diagram of a fibre-optic cable assembly. It shows a circular fibre ring with a central core. A fanhstock clip is attached to the ring. Labels include: SOLID BRASS, SOLID COPPER, FIBRE RING, and FANHSTOCK CLIP.

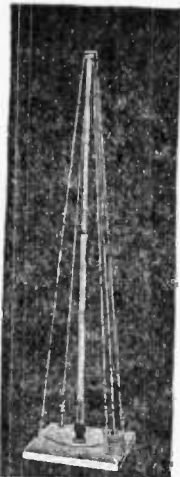
Your catalog has met with approval around here, and it is a hard thing to keep hold of; have had three different service men stick it in their pocket and try to walk away with it. The information in it is valuable to the service man and saves time. I would rather buy from a house that puts out this information.

Clare Turnbull, 553 2nd Street, N. E., Mason City, Ia.

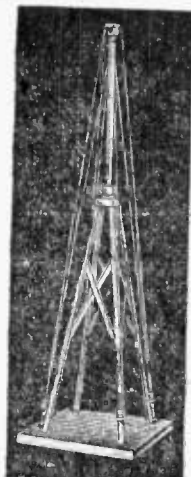


## Morris Umbrella Antennas

The Ultimate in Radio Reception



2151



2152

It is a well established physical fact that in order to absorb a maximum amount of energy from passing electro-magnetic radio waves, a conductor (aerial) must be absolutely perpendicular to the wave front. The smaller the angle of incidence with respect to the wave front i.e. the further the antenna is brought away from the perpendicular, the smaller is the amount of current induced in it.

The nearest approach to the ideal vertical antenna are the Morris Umbrella Aerials as illustrated above. These consist of either a single mast or a tower, supported by four well insulated guy wires which constitute the antennas.

**INCREASES SELECTIVITY—SENSITIVITY—RANGE**  
Antennas such as these are absolutely non-directional. Improve reception, increase selectivity, treble distance range and reduce static interference. Easily and quickly mounted in a minimum of space. Constructed of the finest material available in two different types.

No. 2151 MORRIS UMBRELLA MAST, complete with wires, insulators, roof bracket for pipe, etc., approximately 6 ft. high; mast is adjustable. Shipping weight, 6 lbs.

**YOUR PRICE** List Price \$3.00 **\$1.92**

No. 2152 MORRIS UMBRELLA TOWER, complete with tower, extension pipe, insulators, pick-up wires and lead-in wires. Can be extended any length by adding section of 1/2" pipe. Shipped in collapsible form. Shipping weight, 7 lbs.

**YOUR PRICE** List Price \$4.00 **\$2.65**



### Copper Aerial Wire

100 Ft. Coils

Seven stranded, highly tensile copper antenna wire. Manufactured to withstand safely all conditions of antenna strain. Sold only in 100 ft. rolls. Shipping wt. 2 1/2 lbs.

No.	Description	List Price	YOUR PRICE
1950	7/25, 7 strand, bare	\$0.35	<b>\$0.20</b>
1951	7/24, 7 strand, bare	.45	<b>\$0.30</b>
1952	7/22, 7 strand, bare	.55	<b>\$0.38</b>
1953	7/22, 7 strand, enameled	.60	<b>\$0.42</b>
1954	7/22, 7 strand, tinned	.60	<b>\$0.42</b>

### Window Lead-in Strip



A soft copper lead-in strip, heavily insulated with flexible weatherproof sheathing. Easily bent into any size or shape window sash. Will not interfere with the closing of windows. Equipped with two Falmestock binding posts for making easy connections. Absolutely essential for noise-free reception. Shipping wt., 2 oz.

No.	Size	List Price	YOUR PRICE
2153	12"x3"	\$0.25	<b>\$0.04</b>
2154	15"x3"	.30	<b>\$0.06</b>

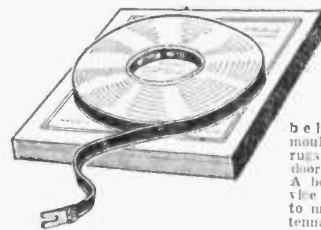
## Standard Aerial Kit



A complete antenna kit packed in a strong two piece box. Contains the following items: 50 ft. solid copper, rubber covered lead in wire; 100 ft. 7 strand copper antenna wire; 2 Porcelain Nail Knobs; 2 Porcelain Insulators; 1 Lightning Arrester; 1 9-inch copper ground clamp; 1 12-inch window strip lead-in. Shipping weight, 3 lbs.

List Price \$1.00  
No. 1633 Aerial Kit  
**YOUR PRICE** **\$0.65**

## Indoor Aerial Ribbon

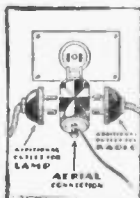


Superior Grade  
We do not sell a second, and cheaper grade.

A woven metallic tape for stringing behind picture moulding or under rugs in making indoor installations. A boon to the service man who has to make indoor antenna installations. In 100 ft. rolls.

Shipping weight, 1 lb.  
No. 1632 Indoor Aerial Ribbon.  
**YOUR PRICE** List Price, \$1.00. **\$0.38**

## Dumont Socketenna

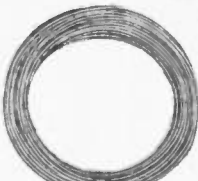


This device is equipped for either plug or screw connection to the electric light line and has two receptacles for the radio receiver and such other equipment as must be connected to the line. Utilizes the radio frequency energy picked up in the power supply line and does away with the usual outside antenna. Does away with a portion of the static interference so annoying in some localities. May be used on A.C. or D.C. circuits. Shipping weight, 1/2 lb.

List Price \$1.25

No. 1647 Dumont Socketenna  
**YOUR PRICE** **\$0.73**

## Hook-Up Wire



Hook up wire of the same kind that is used in all manufactured receivers. Push-Bank feature eliminates the necessity for stripping and definitely speeds up work in wiring receivers or amplifiers. Core of No. 18 tinned copper wire for easy soldering covered with two layers of impregnated fabric which will not unravel. Shipping weight, 1 lb.

No. 1660 Hook-Up Wire. 25 foot coil. **\$0.18**  
No. 1661 Hook-Up Wire. 50 foot coil. **\$0.30**

## Rubber-Covered Hook-Up Wire

For ordinary and high voltage work. Stranded copper wire (tinned for easy soldering) covered with flexible rubber insulation which will not become brittle and crack under any conditions of surrounding heat or weather. Recommended for 250, pentode and transmitter construction and repair work. Shipping weight, 1 1/2 lbs.

List Price \$5.50

No. 1663 Rubber-Covered Hook-Up Wire 25 ft. Coil. **\$0.17**

**YOUR PRICE** List Price \$1.00  
No. 1664 Rubber-Covered Hook-Up Wire 50 ft. Coil. **\$0.30**

**YOUR PRICE** **\$0.30**

## Pipe Ground Clamp



This clamp is, without reservation, the truly ultimate in ground clamps. The most handy, most efficient, most popular and most easily mounted ground clamp that has ever been produced. Affords a solid, positive electrical connection right through paint, dust, oil or grit. Is provided with a screw binding post for making easy connections. Shipping weight, 4 oz.

No. 2161 Pipe Ground Clamp  
**YOUR PRICE** List Price \$0.10  
**\$0.06**  
10 for \$0.55

## I.C.A. Insultenna-Aerial Eliminator

NO MORE OUTDOOR AERIAL



Here is an amazing development, the result of painstaking and indefatigable engineering research, which completely eliminates the necessity for either outdoor or indoor antennas.

The principle of the Insultenna is as unique and novel as it is radical. Hidden inside its neat, compact case is a new type filtered aerial wire and several condensers all of which give it the capacity of 75 feet of ordinary antenna wire. Here is an item which every serviceman should carry in his kit and demonstrate to his clients.

It requires no sales ability or explanations. Merely hook it up and it's sold. No more hazardous adventures on the roof, installing aerials, no more blown down or snapped antennas; install an Insultenna and then forget about it. It requires no attention or servicing.

### NOT A LIGHT-SOCKET ANTENNA

Insultenna is not a light-socket antenna and has no connection whatsoever with the electric light current line, hence eliminating any possibility of A. C. hum. It is quite free from interference and man-made static; a 100% efficient, fool-proof modern aerial substitute. Small (5"x2 1/2"x1 1/2"), neat, compact. Shipping weight, 2 lbs.

List Price \$2.50

No. 2150 I.C.A. Insultenna  
**YOUR PRICE** **\$1.45**

## Aerial Insulators

Made of extremely tensile porcelain compound. Will not snap under any conditions of antenna strain. Sheds water easily, and therefore will not short of 10. Shipping weight, 3 lbs. for 10.

No.	Description	List Price per 10	YOUR PRICE per 10
2155	Porcelain Insulators 2 1/2"	\$0.50	<b>\$0.20</b>
2156	Glass Insulators 3 1/2"	.65	<b>\$0.38</b>
2157	Nailit Knobs Insulators	.40	<b>\$0.20</b>

## Approved Lightning Arrester

An accurately built, highly efficient lightning arrester, permanently sealed in a high grade heat-resisting enameled porcelain cast. Equipped with antenna and ground binding posts and two mounting holes. Approved by Underwriters Laboratories. Each arrester is individually boxed. Shipping weight, 1 lb.

List Price \$0.25

No. 2159 Approved Lightning Arrester  
**YOUR PRICE** **\$0.12**  
12 for \$1.00

## Antenna Tension Spring

Keeps Aerial Always Taut

Antennas expand in warm weather and contract in cold. Unless proper precautions are taken they will either grow too taut and snap or else grow too long and sag. The antenna tension spring is the easiest, most effective and most economical cure for such troubles. These springs are given the proper value of elasticity to permit them to yield readily to shrink antennas and at the same time maintain a constant pulling force to take care of any possible slack. Shipping weight, 1 lb.

List Price \$0.30

No. 2160 Antenna Tension Spring  
**YOUR PRICE** **\$0.12**

## Porcelain Screw Eyes

For insulating or "standing off" lead-in wires, antennas, communication wires, etc., from buildings, trees, and other grounded objects. Helps eliminate static and other objectionable noises. Sold only in 25 lots. Shipping weight, 4 lbs.

No.	Description	List Price per 25	YOUR PRICE per 25
2162	Screw Eyes, porcelain 3"	\$0.95	<b>\$0.66</b>
2163	Screw Eyes, porcelain 6"	1.20	<b>\$0.90</b>

# New! Official Radio Service Kit New!

Originated and Guaranteed by  
**RADIO TRADING CO.**

**IMPORTANT**

Several months ago we sent out a questionnaire to 2,000 radio service men and asked them what their ideas were on a radio service kit. 865 answered us, and their ideas are now embodied in the Official Radio Service Kit which we herewith present to you.

This kit is a marvel in compactness, a marvel in price, a marvel in time saving. For the first time you are offered a comprehensive kit that contains **EVERYTHING** that the service man requires in making calls.

## ARE YOU A 50 PER CENT SERVICE MAN?

Too often so-called service men go on a job with an analyzer and a pair of pliers. Nine times out of ten they have to run back to the shop to get tools, and thus their usefulness is cut down as a rule, 50% and over. Why not take along, on every job, a complete, neat-appearing service kit that looks just as business-like as your analyzer?

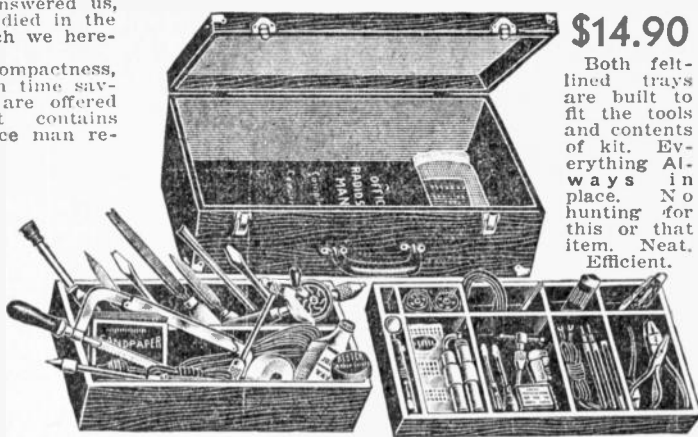
When you call upon a prospect and you arrive with this fine-looking kit, your prospect knows that you mean business. It gives you a professional appearance that every service man requires more than anything else today.

## AND YOU CAN COMMAND MORE MONEY ON YOUR SERVICE CALLS WITH THIS KIT

because the prospect will look upon you as a professional, and not as a tinkerer. When you visit a medical specialist today, you are impressed by his instruments for which you pay. An ordinary doctor commands no such fees. It should be clear to you that if you are a professional, you can get professional prices today too. Even in the face of the "Doc-A-Service-Call" chain organizations that have come into being recently. That is why this marvelous kit will pay for itself inside of three months or less.

Herewith, are the Official Radio Service Kit specifications: Size, small and compact, not larger than a good analyzer; 17 in. long, 6 1/2 in. wide and 10 in. high. Construction, wood veneer throughout, entirely covered with black leatherette, all nickel trimmings, giving outfit a beautiful professional appearance.

There are two trays which fit out. See list of items in center column.



**\$14.90**

Both felt-lined trays are built to fit the tools and contents of kit. Everything Always in place. No hunting for this or that item. Neat. Efficient.

There is sufficient room in the bottom of the kit to place the Official Radio Service Manual, as well as other data sheets (but at the price quoted manual is not included).

The construction of the case and removable trays is such that when the case is being carried not a single screw or lug can fall out of their respective compartments.

Both trays, as well as inside cover, are lined with blue felt, giving kit a beautiful appearance.

Nothing similar has ever been offered before. Only by buying the various materials in tremendous quantities are we enabled to sell this kit at such an extremely low price.

If you were to buy all of the articles separately, in the open market, you would have to pay between \$30.00 and \$35.00 for them.

Due to the present depression, we are enabled to buy quantities of these materials at exceedingly low prices. For that reason, our production cost is exceedingly low, but there is no question that this price will have to be increased later.

Size, 17 in. long, 6 1/2 in. wide and 10 in. high; net weight, 16 lbs.; shipping weight, 18 lbs.

No. 1000—Official Radio Service Kit. **YOUR PRICE ... \$14.90**

### TOP TRAY CONTAINS:

- 1 Pen Flashlight, complete with magnifying dentist's mirror (to look underneath chassis, etc.).
- 1 Automatic alcohol blow torch.
- 1 Box containing 300 assorted screws, nuts, washers, lugs, etc.
- 1 Nickel Bicycle wrench
- 1 Tap holder with one 6/32 tap and one 8-32 tap.
- 1 Set of Test prods with 6 ft. cord.
- 1 Telephone type pliers.
- 1 Diagonal pliers.
- 1 Insulated (5,000 volt insulated handle) heavy pliers.
- 1 Electrician's knife.
- 1 Set of 8 drill points.
- 10 Ft. of Phosphor bronze drum dial cable.
- 1 Neutralizing socket.
- 1 Pack extra size condenser cleaners.
- 3 Small screw drivers.

### LOWER TRAY CONTAINS:

- 1 Complete Neutralizing kit with insulated screw driver and five socket wrenches.
- 1 Electric soldering iron, with 1 extra tip.
- 1 Large and 1 Medium imported screw drivers.
- 2 Small files with handles.
- 1 Large file with handle.
- 1 1/4 in. Star drill, 11 1/2 in. long.
- 1 Electrician's metal hammer.
- 1 Hand drill, 1/4 in. chuck, 10 in. long.
- 1 Hack saw and blade.
- 1 Package Sand papers and emery papers.
- 1 Roll 50 ft. solid push back wire.
- 1 Can genuine Kester radio solder.
- 1/4 lb. of 3/4 in. electrician's tape.
- 1 Bottle Furniture polish.
- 1 Package Furniture cheese-cloth.
- 1 Bottle Nujol (for lubricating purposes).
- 1 Tube special cement (to mend cones, etc.).
- 1 Socket tool to straighten socket prongs.

### WHAT THEY SAY

Gentlemen:—The Service Kit has arrived and I AM WELL PLEASED WITH IT. The Kit contains practically everything a service man would require.

Looking forward to further dealings with your concern and trusting that future service will be as excellent as the value I have received from you in this Service Kit. I remain,

O. H. Schussler  
Box 1016,  
North Warren, Pa.

Dear Sir:—

Today I received the Official Radio Service Kit, WITH WHICH I AM VERY PLEASED, because it contains everything that there is in need for a service man. I will do my best to sell a few kits, because I know IT IS WORTH THE MONEY I PAID FOR IT.

Gottfried Hartman  
420 West Jefferson  
Ann Arbor, Mich.

### CARRYING CASE For Official Radio Service Kit

We are prepared to furnish you with the Official Radio Service Case only, without contents, as described above, just the case and the two empty trays, size 17 in. long 6 1/2 in. wide and 10 in. high.

This case is made entirely of light veneered wood, nickel trimmings, covered entirely with leatherette, inside of case covered in blue felt.

No. 1001—Official Radio Service Carrying Case only.

This case is just the thing to build in a radio set, as a portable.

Service men who wish to build their own analyzers will find this case just the one they have been looking for. There is room enough for the analyzer as well as tools.

Net weight, 4 lbs. Shipping weight, 5 lbs.



View of kit, closed

**YOUR PRICE \$4.20**

### WHAT THEY THINK

Dear Sir:—

I wish to acknowledge receipt of your Service Man's Kit.

The Kit and the tools are just as you described them, and as I think the tools and the carrying case are MIGHTY FINE. THERE IS BUT ONE WORD TO DESCRIBE MY FEELINGS, AND THAT IS, "SATISFIED."

Otto W. Machamer  
410 W. 15th St.,  
Davenport, Ia.

Gentlemen:—

I received the Radio Service Kit and was more than pleased with it. In fact IT FAR EXCEEDED MY EXPECTATIONS.

I shall be glad to send you orders at any time that I may be able to secure them.

Arthur Morgan  
Daytona Beach, Fla.

### PARTS OF THE OFFICIAL RADIO SERVICE KIT — ALL ARTICLES CAN BE BOUGHT SEPARATELY

No. 1695 PEN FLASHLIGHT with batteries for trouble shooting in dark recesses of radio chassis and cabinets.

List Price \$1.25

**\$0.60**

**YOUR PRICE**

No. K1005 DENTIST'S MAGNIFYING MIRROR with clip for attaching to the Pen Flashlight. Enables one to look under inaccessible radio chassis and around corners.

List Price \$0.75

**\$0.30**

**YOUR PRICE**

No. K1006 AUTOMATIC BLOW TORCH for heavy duty soldering and many other purposes (e.g. melting impregnating compound in power repair work, etc.)

List Price \$1.50

**\$0.65**

**YOUR PRICE**



No. K1007 GENEROUS SCREW ASSORTMENT every size screw nut, washer, insulating washers, lock-washers, etc. ever used in radio work.

List Price \$1.25 **\$0.36**

YOUR PRICE

No. K1008 BICYCLE WRENCH a sturdy monkey wrench that will engage every type nut encountered in radio work.

List Price \$0.35 **\$0.18**

YOUR PRICE

No. K1009 TAP WRENCH handy tool made of die-cast steel with 21-tempered jaws that will engage any size tap up to 1/4 inch.

List Price \$0.50 **\$0.20**

YOUR PRICE

No. K1010 6/32" TAP BIT for use with tap wrench above.

List Price \$0.45 **\$0.15**

YOUR PRICE

No. K1011 8/32" TAP BIT for use with tap wrench above.

List Price \$0.45 **\$0.15**

YOUR PRICE

No. 1626 TEST LEADS our catalogue No. 1626 listed elsewhere. Five foot flexible, coded leads with insulator—handled, solderless tips.

List Price \$1.00 **\$0.40**

YOUR PRICE

No. K1012 TELEPHONE PLIERS 5 1/2" long. Made of fine carbon steel. Has long tapered nose and wire cutting edges. Serves a variety of radio repair purposes.

List Price \$1.25 **\$0.48**

YOUR PRICE

No. K1013 DIAGONAL PLIERS 5 1/2" long. Made of fine carbon steel. Will cut both fine and heavy wire.

List Price \$1.50 **\$0.57**

YOUR PRICE

No. K1014 INSULATED PLIERS, handles are insulated to withstand 5000 volts. Constructed of carbon steel with heavy gripping jaws and wire cutter.

List Price \$1.75 **\$0.58**

YOUR PRICE

No. K1015 ELECTRICIAN'S KNIFE sturdily built, steel bladed knife with a multiplicity of uses. Wire stripper and cutter, wood and fibre cutter, screw driver, etc. A real handy tool to have around.

List Price \$1.25 **\$0.50**

YOUR PRICE

No. K1016 SET OF 8 DRILL POINTS contains all the popular sized drills used in radio construction and repair work. Made of highly-tempered carbon steel.

List Price \$0.50 **\$0.20**

YOUR PRICE

No. K1017-18 NEUTRALIZING ADAPTERS listed elsewhere. For balancing oscillating receivers, etc. Set of two, UX and UY.

List Price \$1.00 ea. **\$1.36**

YOUR PRICE

No. K1019 CONDENSER CLEANERS for getting the dust and grit from between the plates of variable condensers.

Package contains 25 cleaners. List Price \$0.25 **\$0.12**

YOUR PRICE

No. K1020 10" SCREW DRIVER, heavy steel screw driver ruggedly constructed of one piece throughout. Handle comfortably rounded with hard wood.

List Price \$0.50 **\$0.25**

YOUR PRICE

No. K1021 6" SCREW DRIVER, same as above but of medium size and duty.

List Price \$0.35 **\$0.15**

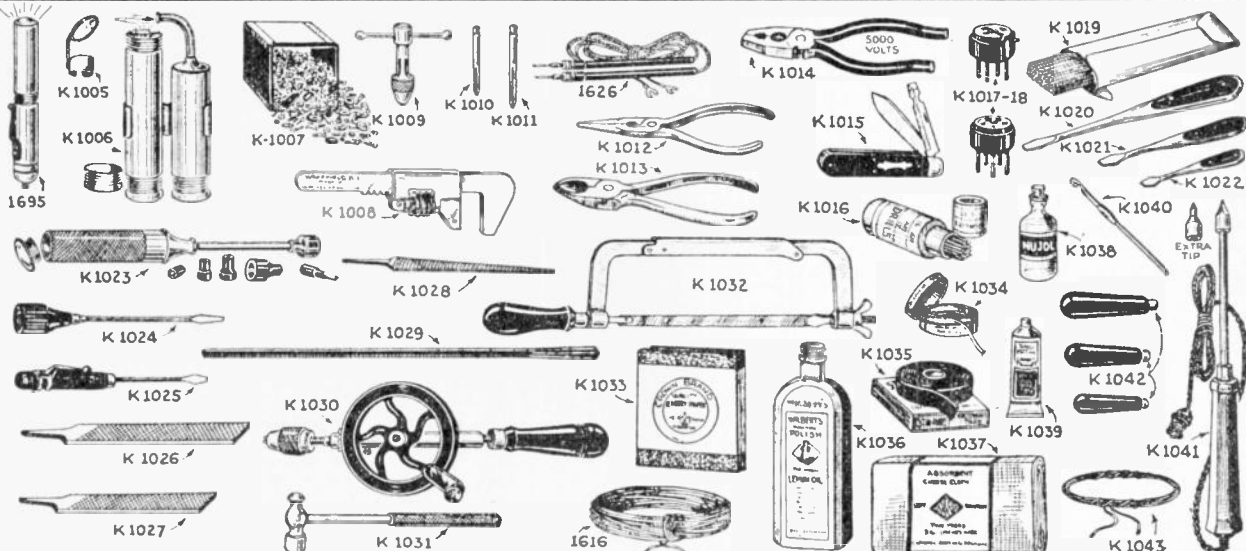
YOUR PRICE

No. K1022 4" SCREW DRIVER, same as above but of small size and light duty.

List Price \$0.25 **\$0.10**

YOUR PRICE

## PARTS OF THE OFFICIAL RADIO SERVICE KIT



No. K1023 SOCKET WRENCH KIT, complete set of socket wrenches made of high grade steel with case-hardened sockets. Will fit all size nuts.

List Price \$1.25 **\$0.48**

YOUR PRICE

No. K1024 LARGE THIN SCREW DRIVER for light duty work. Made especially for set screws of dials and knobs.

List Price \$0.15 **\$0.08**

YOUR PRICE

No. K1025 POCKET SCREW DRIVER for use on set screws and other light duty work. Provided with a pen clip.

List Price \$0.20 **\$0.12**

YOUR PRICE

No. K1026 LARGE FILE, 7" bastard file constructed of highly tempered steel for use on either metal or wood.

List Price \$0.50 **\$0.20**

YOUR PRICE

No. K1027 MEDIUM FILE, same as above except smaller.

List Price \$0.45 **\$0.15**

YOUR PRICE

No. K1028 HALF-ROUND FILE, 4" half round bastard file constructed of same material as above.

List Price \$0.40 **\$0.10**

YOUR PRICE

No. K1029 1/4" STAR DRILL an 8" drill for hammering or drilling 1/4" holes in brick or stone.

List Price \$0.50 **\$0.26**

YOUR PRICE

No. K1030 HAND DRILL, 10" long all-steel drill that will engage all size bits up to 1/4" diameter. Collapsible model.

List Price \$1.50 **\$0.90**

YOUR PRICE

No. K1031 METAL HAMMER, all steel, ball top hammer for all purposes. Takes nails without denting.

List Price \$0.50 **\$0.20**

YOUR PRICE

No. K1032 HACK SAW complete with saw blade. An all-steel, well made tool with sure-grip wooden handle. Adjustable frame.

List Price \$0.75 **\$0.30**

YOUR PRICE

No. K1033 SAND PAPER, medium sized sand paper firmly embedded in tough cloth material. For cleaning radio chassis and other work.

List Price \$0.25 **\$0.10**

YOUR PRICE

No. 1616 HOOK-UP WIRE, roll of 50 feet push-back wire for radio construction and repair purposes.

List Price \$0.50 **\$0.30**

YOUR PRICE

No. K1034 FLUX-CORE SOLDER listed elsewhere. Requires no acids or resins, merely heat.

List Price \$0.50 **\$0.25**

YOUR PRICE

No. K1035 FRICTION TAPE, a 1/4 lb. roll best electric friction tape for insulating exposed or spliced wires and for many other purposes.

List Price \$0.25 **\$0.12**

YOUR PRICE

No. K1036 FURNITURE POLISH, 8 oz. bottle lemon oil-furniture polish for touching up scratches or other accidental abuses to furniture while on servicing jobs.

List Price \$0.35 **\$0.15**

YOUR PRICE

No. K1037 WASTE CLOTH, package cheese cloth as waste in conjunction with the furniture polish above and for many other purposes.

List Price \$0.20 **\$0.15**

YOUR PRICE

No. K1038 RADIO LUBRICANT, bottle of special Nujol lubricating oil for lubricating radio parts.

List Price \$0.15 **\$0.10**

YOUR PRICE

No. K1039 MENDING CEMENT, an approved cement for mending speaker cones, chipped furniture, etc.

List Price \$0.50 **\$0.15**

YOUR PRICE

No. K1040 SOCKET TOOL, a heavy-tipped crochet needle adapted to radio use. Handy for bending socket springs into shape.

List Price \$0.25 **\$0.15**

YOUR PRICE

No. K1041 SOLDERING IRON sturdily constructed, quick heating iron with heat insulated wooden handle. Complete with heat resisting cord, two-piece plug and extra soldering tip.

List Price \$1.50 **\$0.85**

YOUR PRICE

No. 1001 CARRYING CASE listed elsewhere. Sturdily built with two removable trays.

List Price \$8.00 **\$4.20**

YOUR PRICE

No. K1042 FILE HANDLES, set of 3 handles to be used in conjunction with the 3 files above or with any similar tool.

List Price \$0.35 **\$0.15**

YOUR PRICE

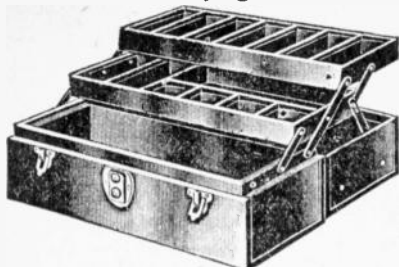
No. K1043 DRUM DIAL CABLE, roll of 10 feet phosphor bronze cable; extremely strong and tensile.

List Price \$0.35 **\$0.20**

YOUR PRICE

RADIO TRADING COMPANY, 25 WEST BROADWAY, NEW YORK, N. Y.

## Radio Carrying Cases



The cases here shown are a new development. They are made in metal throughout with baked olive green enamel finish. These cases are beautifully and strongly made, and will give you a professional appearance. Lock and side locks are of burnished brass.

Smaller illustration shows dimensions and closed view



of the cases. As you open the cover, two trays automatically fold out in position, as shown. As you tilt the cover back, the trays fold automatically into the case. The trays are provided with a number of compartments for tools and all other radio appliances that you may wish to carry. The large box accommodates about eight radio tubes in the bottom compartment. The smaller case accommodates about four tubes.

Cases are strong and rugged, and when closed, nothing can spill. They are marvels of ingenuity, and will pay for themselves many times over.

Large size measures 21 1/2" long, 7 1/4" high and 7" wide. Net weight 8 lbs. Shipping weight 10 lbs.

List Price \$8.50

No. 1002 Carrying Case. **YOUR PRICE \$4.50**

## Small Carrying Case

This case is in all respects the same as the one described above, except that the dimensions are less, otherwise the same in all respects.

Size 12 1/2" long, 7 1/4" high and 7" wide. Net weight, 5 lbs; shipping weight, 6 lbs.

List Price \$6.50

No. 1003 Carrying Case. **YOUR PRICE \$3.35**

## Easy Soldering Phone Tips



Here is a neat, time-saving phone tip that requires but one drop of solder to be attached. Merely insert bare wire and drop solder in the side hole; a clean business-like, and permanent job. Can be used on all ear phones, loud speaker, battery cables, etc. Made of polished non-corrosive metal. Will fit all standard tip jacks and plugs. Shipping weight, 1/4 lb.

List Price \$0.25 per envelope of 10

No. 1597 Easy Soldering Phone Tips **YOUR PRICE, per envelope \$1.00**

12 for

## Phone Tip Jacks

A reliable tip jack with a heavily constructed contact spring, designed to hold the phone tip firmly and insure a good electrical contact. Will take any standard type phone tip or No. 14 gauge wire. Lends dignity to any test bench or panel, amplifier, transmitter or receiver. Neat, compact, efficient. Come two to a card. Shipping weight, 1/4 lb.

List Price \$0.13 per card

No. 1598 Phone Tip Jacks **YOUR PRICE, per card \$0.06**

12 for \$0.80

## Battery Clips



Sure-grip battery clips with non-corrosive properly tensioned set springs. Ideal for battery cables, test cords, test panel leads, as screen-grid caps, transmitting coil caps and for many other purposes. The handiest, most useful clips in manufacturing.

tured. Are available in two sizes, medium and large. Shipping weight, 2 oz.

No.	Description	List Price	YOUR PRICE
2060	Battery Clips medium size	\$0.15	<b>\$0.06</b>
2061	Battery Clips large size	.25	<b>\$0.10</b>

## "Handy-Man" Carrying Case

For the Radio Service Man



An all-steel carrying case that all but says, "Here it is." Contains two sturdily built removable trays with sufficient compartments to accommodate all the screws, lugs, drills, resistors, condensers and other necessary paraphernalia of the service man. The main box will easily house a complete servicing tool kit including large drill and soldering iron. The Handy-Man carrying case will save you time and money by keeping your tools where you can find them and by keeping them in good condition. Neither heat nor moisture can penetrate the case. Built of steel throughout with brown or Gohelium blue baked enamel finish. Main and side locks are of burnished brass. A neat, compact, business-like carrying case. Measures 14" x 6" x 8 1/2" high. Shipping weight, 9 lbs.

List Price \$2.00

No. 1004 Handy-Man Carrying Case. **YOUR PRICE \$0.85**

## Hexagon Nuts, Knurled Nuts and Washers



2850



2854



2856

No.	Size	Quantity	per envelope
2850	6/32x1/4"	20 Hexagon nuts	per envelope
2851	8/32x1/4"	20 Hexagon nuts	per envelope
2852	6/32x5/16"	15 Hexagon nuts	per envelope
2853	8/32x5/16"	15 Hexagon nuts	per envelope
2854	6/32x3/8"	6 Knurled nuts	per envelope
2855	No. 6 Washers	20 Washers	per envelope
2856	No. 8 Washers	20 Washers	per envelope

Packed in brown kraft envelopes with illustrations of the products on the front side; also the quantity. Shipping weight, 1/4 lb.

List Price \$0.15 per envelope

**YOUR PRICE, per envelope \$0.06**  
12 envelopes for **\$0.68**

## Brass and Copper Tinned Terminal Lugs



Essential for clean, solid electrical contacts. Take solder easily. Note: Lug No. 3 requires no solder. Merely insert wire in slotted groove and clamp shut with pliers.

Put up 24 to an envelope. Use lug and catalog numbers when ordering. Shipping weight, 1/4 lb.

List Price \$0.15 per envelope

No.	Terminal Lugs No.	per envelope
2871	Terminal Lugs No. 1	<b>\$0.05</b>
2872	Terminal Lugs No. 2	
2873	Terminal Lugs No. 3	
2874	Terminal Lugs No. 4	
2875	Terminal Lugs No. 5	<b>\$0.55</b>

12 envelopes for

## Aluminum Sub-Panel Brackets

Made of Non-Magnetic Aluminum

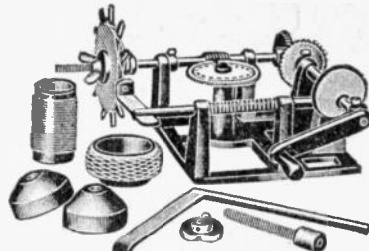


These sub-panel brackets are designed to accommodate by-pass condensers, sockets, wiring, etc., beneath the sub-panel. Brackets will even accommodate R.F. transformers of the midjet type and their shields. Brackets are constructed of light, durable, non-magnetic aluminum and are perforated, and machine drilled ready for use. Shipping weight, 1 lb.

No.	Size	List Price	YOUR PRICE
2877	2 1/2 x 6 3/4"	\$0.40	<b>\$0.27</b>
2878	1 x 8 1/2"	.40	<b>\$0.27</b>
2879	2 x 9"	.60	<b>\$0.41</b>
2881	2 x 11"	.80	<b>\$0.54</b>

## Morris Universal Coil Winder

Winds All Type Coils



A practical, ruggedly constructed coil-winding machine that will wind all the various types R.F. coils used in radio construction and repair work; honey comb, spider web, solenoid, double layer coils, etc.; all of different widths and diameters. A practical and satisfactory machine for the radio service man, experimenter and custom set builder. Coils can be made as neat and as accurate as though they were factory built. Sold complete with all necessary accessories and special recorder with adjustable pointer for counting the number of turns of wire. Suitable for small factory production jobs, etc. Shipping weight, 4 lbs.

List Price \$2.50

No. 1051 Morris Universal Coil Winder. **YOUR PRICE \$4.80**

## Service Men's Screw Assortment

Biggest Value Ever Offered



A generous screw assortment comprising several hundred sized machine screws, nuts, insulating washers both bakelite and fiber, set screws, mica washers, special screws with both round and flat heads,—in short, every conceivable piece of hardware ever used in radio construction and repair work. It is the answer to a Service Man's hardware prayers. Fully one pound of useful

hardware, a great asset to every service kit. Shipping weight, 1 1/4 lbs.

List Price \$0.75

No. K1007 Service Men's Screw Assortment **YOUR PRICE \$0.30**

## Fahnestock Spring Binding Posts



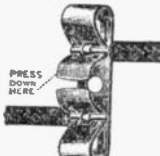
No. 2810 No. 2815



No. 2845



No. 2804



No. 2809C

No. 2815. Takes No. 10 B. and S. wire. Width 5/16" length 3/4". screw hole clears 6/32 screw.

PER DOZEN **\$0.20**

PER DOZEN **\$0.22**

PANEL POSTS

No. 2845. Can be mounted on panels. Stands upright. One of the handiest connectors made. Has threaded hole which takes an 8/32 screw. Furnished with post.

PER DOZEN **\$0.40**

No. 2804. Takes No. 10 wire. Length overall 1" width 3/8" screw hole threaded for 8/32 screw.

PER DOZEN **\$0.32**

DOUBLE CONNECTOR

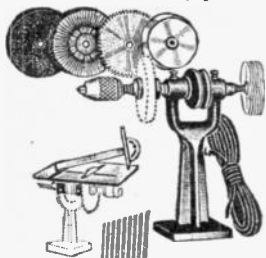
No. 2809C. Takes No. 10 B. and S. wire. Length overall 1 1/2", width 3/8", screw hole passes 8/32 screw. Extra long size—not to be confused with much shorter "similar" connectors.

PER DOZEN **\$0.35**



## Service Men's Complete Workshop Outfit

A Factory in Itself



A complete workshop outfit that performs all the operations of several different machines combined. It grinds, saws, polishes, buffs and drills. No service man's or experimenter's laboratory is really complete without it.

### COMPRISES 9 HIGH-GRADE UNITS

The units consists essentially of 9 high grade, well manufactured parts.

**MAIN STEM AND CHUCK** made as carefully as highest priced machine. Complete with two speed pulley taking up to 9/32" drill. **SAW TABLE AND GUIDE** are accurately constructed and clamp on to the main stem thereby making a complete cut off saw. **ROUND LEATHER BELT** of best grade leather, 5 feet long with connecting clip. **BUFFING WHEEL** 3" laminated cotton lard center. **POLISHING COMPOUND** for use in conjunction with buffing wheel. **CIRCULAR SAW** is 4" in diameter and is made of best high-carbon steel. **WIRE-SCRATCH BUFFER** 4" steel-wire wheel. **GRINDING WHEEL** of fine grade emery, 4 inches in diameter. **DRILL SET** consists of 9 high grade hardened steel drills for 1/16 to 3/16 inch holes. All that is necessary to complete the outfit is small motor. A 1/4 h.p. motor would be sufficient. Shipping weight, 25 lbs.

List Price \$9.00

No. 1075 Service Men's complete Workshop Outfit.

YOUR PRICE

**\$3.40**

## Motor Arbors

These arbors fit directly onto the shaft of any small motor in place of the pulley. Each is equipped with flange and locking nut to hold grinding wheels, circular saws, buffing wheels, etc., and with chuck having 3 hardened jaws capable of engaging all sized drills up to 9/32 inch. Make veritable machine shops out of motors. Shipping weight 4 lbs.



A



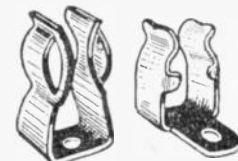
B

No.	Bore	List Price
1076A	3/8"	\$1.50
1077A	1/2"	1.50
1078B	3/4"	1.35
1079B	5/16"	1.35

No.	Bore	List Price
1076A	3/8"	\$0.70
1077A	1/2"	\$0.70
1078B	3/4"	\$0.60
1079B	5/16"	\$0.60

## Fuse and Panel Clips

The fuse clips are made of highly tempered phosphor-bronze alloy and will not tarnish or corrode under any circumstances. Aside from their conventional use as fuse mounts, they are admirably suited for and will tenaciously engage all grid leak type resistors. Most service men and experimenters prefer this type of resistor mounting.



2062 in resistor-coupled amplifiers, to that of the pigtail type since they make a neat, professional-like appearance.

The panel clips are made of tempered spring metal and are a bit smaller than the fuse mounts. In actual use, however, they serve the same purposes as the fuse clips. Shipping weight, 4 oz. Sold in envelope of 12 or larger quantities.

No.	Type	Envelope of 12
2062	Fuse Clips	<b>\$0.24</b>
2063	Panel Clips	<b>\$0.10</b>

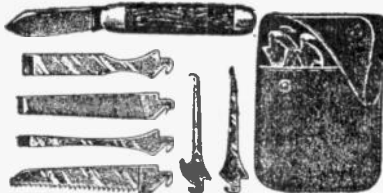
## Buss Fuses 2 Amp.--250 Volts

For use in all circuits where current in excess of 2 amp. would prove injurious or fatal to delicate instruments and other expensive electrical devices. Insert a generous supply of these "life protectors" in all strategic points of the circuit. They cost you but a few cents now but may save you real money later on. Sold complete with mounting clips in lots of 6 only. Shipping weight, 2 oz.

List Price \$0.75 per 6

No.	Type	YOUR PRICE
2064	Buss Fuses 2 Amp.-250 Volts	\$0.30
24 for		\$1.10

## Service Men's Pocket Tool Kit



### Handy, Pocket Size

Manufactured primarily for the use of radio mechanics, service men and experimenters as an auxiliary kit to their regular set of tools. Will perform as well as any larger group of similar units. Does away with the necessity of dragging a heavy mess of tools to small jobs which do not justify it.

### COMPRISES 9 ESSENTIAL RADIO TOOLS

Each of the nine parts comprising this kit is a real tool, made of the finest steel, properly tempered and nickel-plated to guard against rust. A strong, handled, **KEEN-EDGED KNIFE** with patented lock feature provides for the insertion of any of the tools in a jiffy. A **DIE-HARDENED FILE** for use on either wood or metal is beveled down at its outer extremity and serves the purpose of A **HEAVY SCREW-DRIVER**. The **SAW** holds its edge and will not jam. Handy for cutting out corners of cabinets where radio chassis do not exactly fit. A **MEDIUM SIZED SCREW-DRIVER**, aside from the one on the end of the file, will engage the heads of all popular sized radio screws. A **CORRECTLY BEVELED AND HONED CHISEL** comes in handy for many occasions. **POINTED STEEL AWL** for punching holes in wood, fiber or other insulating materials, excellent for getting a wood screw started towards its destination in tight places. A **CORK PULLER** which is essentially an instrument with its end turned up a bit, very handy for pulling up socket prong, to insure proper contact with tubes. And finally A **BOTTLE CAP LIFTER** which may be utilized in any of a variety of ways.

### COMPLETE WITH LEATHER CASE

The kit is put up in an attractive leather case made of English tanned steerhide. Each tool has its own private compartment and is always at hand. Shipping weight, 1 lb.

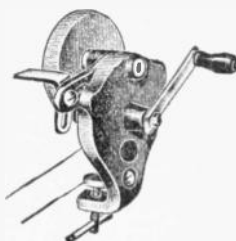
List Price \$3.50

No. 1050 Service Men's Auxiliary Tool Kit.

YOUR PRICE

**\$1.90**

## Service Bench Grinder High Ratio Gears



A ruggedly constructed bench grinder with high ratio all-steel gears carefully machine cut and properly meshed. Has a dirt-proof gear case with extra long bearings which assures gears being in alignment and wheel running true. Complete with 4 inch fine abrasive wheel and adjustable tool rest. Clamps on any table or bench. Shipping weight, 8 lbs.

No. 1052 Service Bench Grinder.

YOUR PRICE

List Price \$3.00

**\$1.00**

## Kester Radio Solder

Resin-Flux Core



A self-fluxing wire solder for radio and electrical soldering work. Requires only heat to use. A highly approved and popular solder that contains the only non-corrosive, non-conductive flux-resin in its heat and most active form. Sold in an attractive metal box which may be used for keeping screw, lugs, etc., when empty. Shipping weight, 1 lb.

List Price \$0.40

No. K1034 Kester Radio Solder.

YOUR PRICE

**\$0.15**

## SCREW HOLDING-SCREW DRIVER

Something New!



This patented screw-driver is good for service men, automobile and airplane mechanics, electricians, carpenters, typewriter repair men and everybody who handles tools—gets into places where it is impossible to get with the

fingers. Will hold nuts, machine and wood screws, lock washers, etc. Blade of the finest tempered steel. Holding device consists of four finger-like prongs of spring steel which hold the screw head to vice-like grip. The tool is highly nickel plated. 8 inches long. Shipping weight, 1 lb.

List Price \$3.50

No. 1066 Screw Holding-Screw Driver

YOUR PRICE

**\$0.90**

## Automatic Alcohol Blow Torches

Pressure Barrel—No Mouth Blowing

These improved, **ENTIRELY AUTOMATIC**, alcohol blow torches are absolutely indispensable to the really up-to-date service man and experimenter. Used for heavy duty soldering, aluminum soldering, tempering of friction springs and for many other radio purposes. Affords an excellent means of melting away sealing compound for repair work on condenser banks, power packs, etc. Available in 3 popular models.

### Model 124 Blow Torch

Flame 1400° Fahrenheit



A new, improved model with a self blowing-strong blast flame. Made of nickel-plated brass, highly polished.

Presents the following improved features: Cleaning wire with each torch for orifice (A). Two spring U clamps (B) riveted together, hold the barrels securely in proper position and permit easy adjustment. Heavy machined filler plug (C) on pressure barrel with machined seat is guaranteed to be leak-proof. Solid brass machined top (D) prevents loosening from breaking or bending and is leak-proof. Screw cap supplied to cover orifice and secured by strong safety chain.

The No. 124 is made to work with ordinary Ball wick. It can be easily re-packed by anyone. Measures 5 1/2" x 1 3/4" over all. Shipping weight, 1 lb.

List Price \$1.50

No. 1060 Model 124 Blow Torch

YOUR PRICE

**\$0.75**

### Model 675 Blow Torch

Heavy Duty—4 Inch Flame



New, heavy duty automatic torch with 4 inch, intense yellow flame of

more than 2000° Fahrenheit. Has a separate lamp flame for priming—which takes only about a minute. Aside from the air already under pressure in the barrel, additional air is mixed with the alcohol vapors through the perforated flame nozzle, thereby forming an extremely combustible mixture. Used for soldering extra large joints or connections and for smelting soft metals. Made of brass throughout, nickel-plated and polished. Shipping weight, 1 lb.

List Price \$2.00

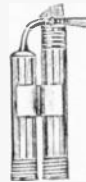
No. 1061 Model 675 Blow Torch

YOUR PRICE

**\$1.15**

### Model 75 Blow Torch

Heat Intensity Over 1200° Fahr.



Made to meet that demand in the trade where price is the main factor. Constructed of brass throughout, nickel plated and polished. Simple and practical construction. All threads are rolled over at right angles with the pitch line of the threads thus insuring proper seating against the gaskets and leakproof construction. Top of pressure barrel made from solid brass, prevents goose-neck bending. Actual size overall, 5 1/2" x 1 3/4". Each torch packed in individual box. Shipping weight, 1 lb.

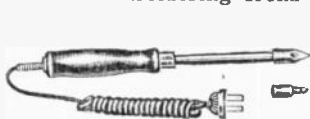
List Price \$1.00

No. K1006 Model 75 Blow Torch

YOUR PRICE

**\$0.60**

## Soldering Irons



Here are exceptional values in soldering irons! Fast heating soldering irons that rise rapidly to

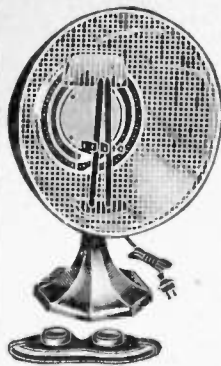
the proper temperature and then remain there until the current is shut off. Constructed of the finest material available; rapid heating element, excellent heat-conducting tip, metal shaft and wooden handle. Sold complete with asbestos-covered, heat-resisting cord and two piece plug. Each iron is individually packed in factory boxes. Shipping weight, 2 1/2 lbs.

No.	Description	List Price	YOUR PRICE
K1041A	Soldering Iron Tu-Tips	\$2.00	<b>\$1.12</b>
K1041	Soldering Iron heavy duty	\$1.50	<b>\$0.75</b>



## Improved Sun Lamps

Radiate Ultra-Violet and Infra Red Rays  
Fully Guaranteed



GOGGLES

### PRODUCES REAL SUN TAN

A genuine SUN TAN can easily and quickly be secured with the new "HEALTH" lamp. A few minutes a day spent bathing in the rays of this lamp will give you the same kind of tan you would get spending a month at the beaches. At the same time you are freeing your skin from pimples and blemishes. Your body is building resistance to sickness, and your entire system is being invigorated.

### SAFE AND SIMPLE TO OPERATE

Designated substantially to give perfect service for many years and is so easily and safely operated that a child may have it working in a minute's time. Uses 6 mm. 6" carbons broken in half to operate the lamp thereby eliminating the necessity of placing heavy fuses in the house lighting circuit. The resistance coil is of the very best nickel chrome wire and operates with a wide margin of safety. Sold complete with goggles, carbons, and instructions. Shipping weight 5 lbs.

List Price \$12.00

No. 1975 Improved Sun Lamps.

YOUR PRICE

No. 1976 Extra Goggles.

YOUR PRICE

No. 1977 Box of 10, 6 mm 6" Replacement Carbons.

YOUR PRICE

\$5.45

\$0.21

\$1.10

## Nickel Plated Hot Plate Stove



A sturdily built, heavy duty electric hot plate which lends itself readily to a variety of uses. Do not compare with cheaper grade enamel style. Made of heavy steel with genuine nichrome wire element embedded in high-grade porcelain tracks. Service men find these electric stoves quite useful for melting pitch and other impregnating materials, softening hard rubber products for moulding purposes and for many other uses. Hot plates are 8 1/2" in diameter and 4 1/2" high and are equipped with 6 ft. of electric cord and a one piece attachment plug. Sealed in original factory carton. For 110-115 volts A.C. or D.C. Shipping weight, 3 lbs.

List Price \$3.50

No. 1978 Nickel Plated Hot Plate Stove.

YOUR PRICE

\$1.10

## Electric Grill Stove



A superior grade electric grill stove for 110-115 volts A.C. or D.C. Has a genuine nichrome heating element firmly attached to an asbestos bed. Complete with cord and plug. Shipping Weight, 2 lbs.

List Price \$2.50

No. 1979 Electric Grill Stove.

YOUR PRICE

\$0.65

## Replacement Cone Glowcoils

Genuine nichrome replacement elements for electric bowl heaters, porcelain supporting structure with standard Edison screw base. Shipping weight, 1/2 lb.

List Price \$0.35

No. 3902 Replacement Glow Coils.

YOUR PRICE

\$0.21

## Hydro-Electric Water Heater



Fully Guaranteed  
Running hot water direct from your cold water faucet - instantly - continuously. Requires no rewiring or extra work of any kind. Merely slip one on any faucet, turn on the water and plug into nearest electric outlet. Seems paradoxical to you, just as it did to us, until we actually had it demonstrate! for us. It worked! Boiling hot water flowed from the nozzle just as soon as the current was turned on.

### ADDED MONEY FOR SERVICE MEN

Many wide awake service men are taking advantage of this astounding invention to make sales incidental to their service work. Requires no salesmanship. Sell on its own merits. Place one in your service kit. Demonstrate it on your next job. Every one is a sure seller.

### FITS ALL FAUCETS—WORKS ON A.C. OR D.C.

A neat compact unit of beautiful and original design keeping in line with the latest trend in household porcelain fixtures. Measures but 5" x 3" in diameter and weighs but 1 1/4 lbs. Comes complete, ready to use with 8 ft. rubber-insulated, asbestos-covered, heat-resisting cord and wall and socket plugs. Has a special wide-mouthed suction nozzle that engages practically any type faucet. Operates on 110-120 volts A.C. or D.C. Shipping weight, 2 1/2 lbs.

List Price, \$5.00

No. 1990 Hydro-Electric Water Heater.

YOUR PRICE

\$2.50

## Cigar Lighter Unit



A genuine cigar lighter replacement unit, the size and shape of a fuse but with a high grade nichrome heating element built in. Has a standard electric light screw base.

Screw one into any light socket, turn on the current and presto! you have a dull red glowing element ready to light any cigar or cigarette. Many Servicemen keep a supply of these units in their service kits and demonstrate them to their clients. Every lighter is a sure seller. Shipping weight, 1 oz.

List Price \$3.00

No. 1980 Cigar Lighter Unit.

YOUR PRICE

\$0.14

## Nichrome Heater-Wire



600 Watts.  
A replacement unit for all electrical appliances using nichrome or other resistance wire as the heating element. Service men can earn extra money by making incidental repairs on electric stoves, toasters and other heating appliances while working on a job. May also be used as regular resistance wire in radio and allied circuits. Will safely dissipate a tremendous amount of heat. Keep several units on hand in case of emergency. Put up one element to a card. Shipping weight, 1/2 lb.

List Price \$2.50

No. 1981 Nichrome Heater Wire.

YOUR PRICE, per card

\$0.18

## Socket Type Flasher



An ingenious device that makes and breaks electrical circuits regularly and automatically. Remove electric bulb from any socket, insert the flasher in its place and then recrew the bulb in the flasher receptacle. In a few seconds the bulb starts to flash, on and off at regular intervals. Ideal for flashing Christmas tree lights, display lights and electrical signs. Shipping weight, 1/2 lb.

No.	Type	List Price	YOUR PRICE
3001	110 volts	\$0.25	\$0.12
3002	120 volts	.40	\$0.16

Gentlemen:

In my former orders I have failed to express my thanks to you for your comprehensive testing of materials and the excellent descriptive matter relative to each item. I also appreciate the first few pages of service data. I think it a fine idea. Keep it up.

K. W. Griffith

2320 Maple Street

Little Rock, Ark.

## Universal Electric Clock

A Certified Instrument



The makers of Universal join us in certifying that WE GUARANTEE THIS PRECISION INSTRUMENT against all defects in materials and in electrical and mechanical operation FOR ONE FULL YEAR. Once they are started they can neither lose nor gain even a few seconds.

The only thing that can stop the operation of Universal is a temporary cutoff of your house current. If through some rare accident the power is interrupted at your central station, rather than tell a lie, Universal will stop operating and will signal the hand through its arrested second hand the visual means of determining whether the clock is operating.

### LYF-LONG LUBRICATION

A feature of this clock is its life-long lubrication system which provides a practically unlimited lubricating supply that will withstand the ravages of time and temperature. The constant filming of all frictional parts reduces wear to a negligible minimum and thus insures the smooth, efficient, noiseless and uninterrupted operation of Universal clocks. Complete in modernistic design, unbreakable Gothic case, in antique bronze finish; and satin finished dial face. Shipping weight, 5 lbs. For A.C. 60 cycle operation.

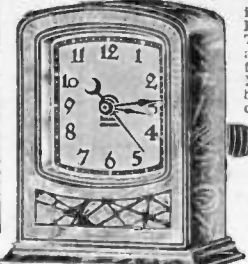
List Price \$9.95

No. 1687 Universal Electric Clock.

YOUR PRICE

\$2.50

## Empress Electric Squareklox



An electric clock using the famous EMPRESS SYNCHRONISTIC MOVEMENT. Naval observatory Time from your light socket! No spring to wind, no batteries. Never out of order. Lifetime used at the factory. In a metal shield modernistic design square case with antique grey-black satin finish. Measures 5 1/2 x 1 1/2 x 1 1/2". Has an old-gold dial face with embossed black enamel numbers. A full-sweep second hand revolves constantly when clock is in operation. For 110 volts 60 cycle A.C. only. Shipping weight, 4 lbs.

List Price \$5.50

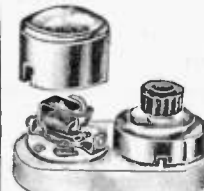
No. 1688 Empress Electric Squareklox

YOUR PRICE

\$2.25

## G. E. Remindo Switch-Buzzer

Works in series with 110 volt, A.C. line



An ingenious device, which when placed in series with any electrical instrument or equipment working directly from the 110 volt, A.C. line will emit a low, pleasant buzz while the switch is "on". Intended mainly for the purpose which its name "Remindo" suggests; that is, to remind one that some particular instrument or apparatus is still in operation. Recommended for soldering iron, regular buzzing system (in which capacity it entirely eliminates the usual stepdown transformer), etc.

The ingenious service man or experimenter will find many other uses for this little unit. The buzzer and rotary switch are mounted on a porcelain base and are fully shielded with nickel-plated metal jackets. Measures 3 1/2 x 2 1/2 x 1 1/2". Shipping weight, 1 lb.

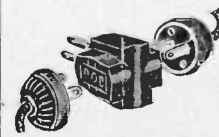
List Price \$1.50

No. 2070 G.E. Remindo Switch-Buzzer

YOUR PRICE

\$0.60

## Twin Flasher



Works on the same principle as the socket type Flasher with the exception that it engages two male plugs simultaneously. Made of genuine moulded Bakelite with two protruding prongs which fit all standard type female receptacles. Shipping weight, 1/2 lb.

List Price \$0.40

No. 3000 Twin Flasher

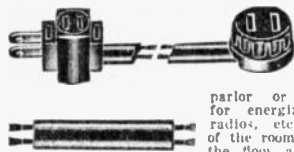
YOUR PRICE

\$0.21



# ELECTRICAL SPECIALTIES

## "Under-the-Rug" Cord Set



A specially manufactured, extremely thin, two-conductor cord, designed as an extension cord to run under the living-room rug for energizing floor lamps, radios, etc., in far corners of the room. Lies flush with the floor and is not noticeable through the rug, which there were nothing under it. Ideal for extension systems where it is necessary to tack the cord on the wall. Gives a neat, professional-like appearance. Sold in complete sets consisting of special flat two-conductor cord, Bakelite cube tap and Bakelite wall outlet. Both tap and wall outlet match the color of the cord. Packed one set to a box. Shipping weight, 4 lbs.

No.	Size	List Price	YOUR PRICE
3003	12 ft. length	\$1.50	<b>\$0.98</b>
3004	15 ft. length	1.65	<b>\$1.15</b>

## Attractive Chain Switch

3A-125 V. to 1A-250 V.



Convenient chain switch, ruggedly constructed and shielded throughout. Used for controlling electrical appliances and for breaking or making any other electrical or radio circuit carrying up to 3 amps. at 125 volts or 1 amp. at 250 volts. All moving parts are firmly pivoted on an insulated frame. Set upon a porcelain base and shielded with a brass jacket. For desk or panel mounting. Shipping weight 1/2 lb.

List Price \$0.45  
**YOUR PRICE \$0.25**

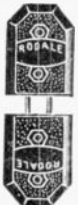
## Feed-Thru Bakelite Switch



A general utility toggle switch, made of genuine moulded Bakelite. Ideal for use on soldering irons, eliminators, power packs, receivers and all electrical appliances which do not already have built in on-off switches. Neatly engages all standard electrical feed cords. Shipping weight, 1/2 lb.

List Price \$0.35  
**YOUR PRICE \$0.20**

## Midget Cord Connector



A well-built, flat-terminal cord connector for light duty work. Recommended for light motors, machines, testing instruments, such as tube checkers, electric oscillators, portable electric sets, etc. Made of imitation dull-finished Bakelite with countersunk bolts and nuts. Shipping weight 4 oz.

List Price \$0.30  
**YOUR PRICE \$0.18**

Box of 10 \$1.65

## Bakelite Handle Plug



A genuine Bakelite male plug with a sure-grip handle feature. Contact prongs are made of highly tempered, non-corrosive brass which insures perfect electrical contact. Shipping weight, 1/4 lb.

List Price \$0.20  
**YOUR PRICE \$0.08**

Box of 10 — \$0.65

## One-Piece Attachment Plug



Male and female plugs combined into one unit. Will safely handle 660 watts without heating. Engages all standard Edison screw type receptacles and sockets. Shipping weight 1/4 lb.

List Price \$0.25  
**YOUR PRICE \$0.10**

## Bakelite Current Tap



A useful combination of electric taps which makes it possible to light an electric light bulb and make two external plug connections, all at the same time and from the same socket. Made of one piece genuine Bakelite construction and provided with a standard Edison screw base. Shipping weight, 1 lb.

List Price \$0.25

No. 3013 Bakelite Current Tap  
**YOUR PRICE \$0.14**

## Cube Tap Cord Set

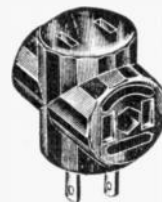


Here is a very convenient device for supplying current to one or more lamps, radio sets, ornament light, etc., without the bother of splicing wires, or attaching additional outlets to the walls. Comes complete with 6 ft. 2/18 silk parallel cord with inner braid, approved by Underwriters, and two piece male-female connection plug. Cube tap is made of moulded Bakelite and will engage any standard male plug. Shipping weight, 1/2 lb.

List Price \$0.75

No. 3014 Triple Outlet Cube Tap  
**YOUR PRICE \$0.26**

## Electric Cube Tap



A convenient three-way electric light outlet consisting of highly tempered contact springs firmly embedded in a genuine Bakelite housing. Will engage any standard female plug or wall receptacle. Shipping weight, 4 oz.

List Price \$0.15 ea.

No. 3015 Electric Cube Tap  
**YOUR PRICE \$0.10**

12 for \$0.68

## Heater Switch Plug



Heavy duty, heat-resisting heater plug with built-in on off switch conveniently located. Made of durable moulded imitation Bakelite. Complete with cord-protecting spring. Shipping weight, 1 lb.

List Price \$0.35

No. 3016 Heater Switch Plug  
**YOUR PRICE \$0.22**

Box of 10 — \$2.00

## Heater Plug



Heavy duty, heat-resisting plug, made of moulded imitation Bakelite. Contact jacks are of the highly tempered spring-action type which insure positive electrical contact. Complete with cord-protecting spring. Shipping weight, 1 lb.

List Price \$0.15

No. 3017 Heater Plug  
**YOUR PRICE \$0.08**

Box of 10 — \$0.75

## Switch Plug and Cord Set



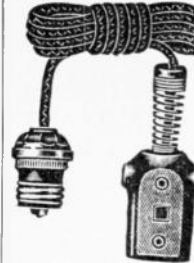
Six feet of asbestos covered, heat resisting, high current, electric cord with shut off switch built into the attachment plug, which is of armoured Bakelite. Complete with two piece male-female connection plug. Shipping weight 1/2 lb.

List Price, \$0.75

No. 3018 Switch Plug and Cord Set  
**YOUR PRICE \$0.32**

12 for \$3.60

## Heater Cord Set



Six feet of asbestos covered, heat resisting electric cord with polished, imitation Bakelite attachment plug and two piece male and female connection plug. The ingenious serviceman will find many other uses for this quality heater cord set other than for its application to electrical appliances; it can be used for example, for supplying current to dynamic speaker field coils and for many other purposes. Shipping weight 1/2 lb.

List Price \$0.60  
No. 3019 Heater Cord Set  
**YOUR PRICE \$0.25**

## G.E. Flush-Mount Electric Receptacle



A flush-mount electric light wall and panel outlet with a multiplicity of uses. Aside from its conventional use as a house current outlet it makes a convenient antenna-ground receptacle, speaker and earphone outlet and can easily be mounted on any chassis or sub panel to be used as a field supply socket for A.C. or D.C. dynamic speakers. Will perform safely in any circuit using up to 10 amps. at 250 volts or 15 amps. at 125 volts.

The contact springs are embedded in a moulded Bakelite form which in turn is surrounded entirely by a metal case acting as a shield. Two protruding lugs at the bottom of the unit make connection with the contact springs. A product of the General Electric Laboratories. Shipping weight, 4 oz.

List Price \$0.40

No. 3020 G.E. Flush-Mount Electric Receptacle  
**YOUR PRICE \$0.10**

12 for \$1.10

## Bakelite Electric Wall Outlet



A handsome, well-made, genuine brown Bakelite electric wall outlet. Excellent for use as speaker outlets where several speakers are used simultaneously in different rooms. Easily attached with one wood screw. Shipping weight, 1/4 lb.

List Price \$0.20  
No. 3021 Bakelite Electric Wall Outlet  
**YOUR PRICE \$0.11**

Carton of 20 — \$1.85

## Porcelain Double-Outlet



A popular, two-way electric tap made of high grade porcelain, properly grooved at the bottom to permit free passage of wires. Mounts to wall with single wood screw. Shipping weight, 1/4 lb.

List Price \$0.25

No. 3022 Porcelain Double-Outlet  
**YOUR PRICE \$0.15**

## Trouble-Finder Lamp Set



Very often service men are called upon to service receivers placed in dark or far corners of a room where light is meager or where the only available light tap is already engaged by the receiver itself. For such and similar predicaments the Trouble-Finder Lamp Set becomes of inestimable value. Made up with heavy, flexible rubber cord, all rubber easy-grip handle, sure-grip rubber plug, and metal guard and hook for a 60 watt lamp. The handle, guard and hook may be had separately. Shipping weight 3 and 4 and 2 lbs, respectively.

No.	Size	List Price	YOUR PRICE
3005	12 ft. length	\$1.50	<b>\$1.25</b>
3006	20 ft. length	1.85	<b>\$1.50</b>
3007	Handle, Guard and Hook	1.00	<b>\$0.68</b>

## VACUUM CLEANERS AT PRICES NEVER OFFERED BEFORE FULLY GUARANTEED

These machines are so thoroughly inspected, and rebuilt at the factory that we unhesitatingly place upon them an

### UNCONDITIONAL 6 MONTHS GUARANTEE

Should they prove defective during that period of time we shall cheerfully repair or if necessary, even replace them without extra charge.

When, a machine, a typewriter for instance, (which has an intricate maze of moving parts) is renovated in such a way as to have ALL MOVING PARTS REPLACED WITH NEW ONES it will naturally, and actually perform as smoothly and as easily as though it were new; for, practically speaking, IT IS A NEW MACHINE. The metal castings and other rigid parts need not be replaced since they are merely supporting structures which never "age" or wear. These "new" machines are re-sold to the public at a tremendously large saving. All this is true, and even more so, with vacuum cleaners which have considerably less moving parts than a typewriter.

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Our vacuum cleaners are thoroughly and carefully remanufactured. All component parts, no matter how slightly worn, are replaced with new ones; we supply new bags, cord brushes, hollis and other parts. Even the chassis itself is replated and polished. We carry 9 different models in stock.

No. 1991 WESTERN-ELECTRIC—Gear Shift in housing gives either straight suction or suction with motor-driven brush. Pistol grip handle. Switch in handle. Polished aluminum housing. 13 inch nozzle. Shipping weight, 17 lbs. List Price \$57.50.

**YOUR PRICE \$12.75**

No. 1992 UNIVERSAL—Straight suction. No brush. Pistol grip handle. Switch in handle. Polished aluminum housing. 13 inch nozzle. Shipping weight, 20 lbs. List Price \$59.50.

**YOUR PRICE \$12.75**



**\$12.75    \$15.00**

No. 1993 HAMILTON-BEACH—Motor driven brush. Pistol grip handle. Switch in handle. Polished aluminum housing. 12 inch nozzle. Shipping weight, 20 lbs. List Price \$39.50.

**YOUR PRICE \$13.50**

No. 1994 EUREKA—Straight suction. Fixed brush. Pistol grip handle. Switch in handle. Polished aluminum housing. 13 inch nozzle. Shipping weight, 20 lbs. List Price \$52.50.

**YOUR PRICE \$14.25**

No. 1995 HOOVER—Motor driven brush. Foot control switch. Black enameled steel motor housing. 13 inch nozzle. Shipping weight, 24 lbs. List Price \$63.50.

**YOUR PRICE \$14.25**

No. 1996 PREMIER DUPLEX—Motor driven brush. Pistol grip handle. Switch trigger in handle. Polished aluminum housing. 13 inch nozzle. Shipping weight, 20 lbs. List Price \$60.00.

**YOUR PRICE \$18.50**

No. 1997—BEE-VAC—Straight suction. Fixed brush. Pistol grip handle. Switch in handle. Polished aluminum housing. 12 inch nozzle. Shipping weight, 17 lbs. List Price \$39.50.

**YOUR PRICE \$9.75**

No. 1998 PREMIER—Straight suction. Fixed brush. Pistol grip handle. Switch in handle. Polished aluminum housing. 13 inch nozzle. Shipping weight, 17 lbs. List Price \$40.00.

**YOUR PRICE \$9.75**

No. 1999 ROYAL—Straight suction. Fixed brush. Pistol grip handle. Switch in handle. Polished aluminum housing. 14 inch nozzle. Shipping weight, 18 lbs. List Price \$55.00.

**YOUR PRICE \$12.75**

Attachment accessories comprising suction coupling unit, extension rod, extra-long suction hose, upholstery nozzle, upholstery brush, and radiator nozzle may be had at a small additional cost.

## R. T. C. POWER AND LIGHT PLANT

800 WATTS, 32-110 VOLTS D.C.

### CONVERTS GASOLINE TO ELECTRICITY

We firmly believe that this is the first opportunity ever given the radio service technician to CASH IN ON A REAL MARKET outside his own particular field of endeavor. Never before has there been a more important part in the general make-up of all earthly things, in the enlightenment of man's daily tasks, that it is hard to imagine how some people can possibly "get along" without it. Electric light is by far the safest, cleanest and brightest artificial light known, and today practically every home, business house, church, hall, etc. WITHIN THE ZONE OF A CENTRAL STATION, uses electricity, not only for lighting but for all needs in which electrically operated appliances, radios and electrical time and labor saving devices can be made to perform useful work. YET FARMS, CAMPS, STORES, GAS STATIONS, SUMMER HOMES AND MANY FOREIGN LOCATIONS OUTSIDE THE ZONE OF CENTRAL STATIONS HAVE NOT HAD THESE ADVANTAGES. HERE THEN LIES A RIPE FIELD FOR THE WIDE AWAKE RADIO SERVICE MAN, ELECTRICIAN OR EXPERIMENTER. ALL THESE PLACES ARE EXCELLENT PROSPECTS FOR THE R.T.C. POWER AND LIGHT PLANT.

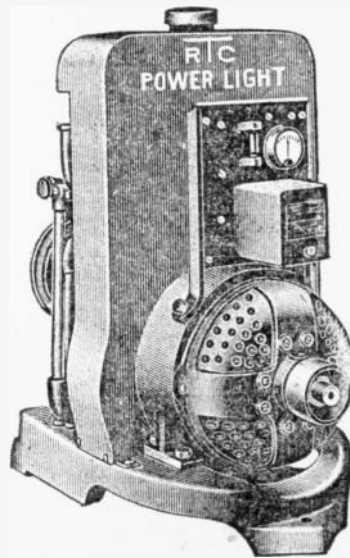
### SELLS ON ITS OWN MERITS

Many Radio Service Men have already taken advantage of this offer, by setting up demonstration outfits in their own homes or on small automobile trucks, thereby making handsome incomes aside from their regular incomes. It is an easy matter to convince prospective customers of the advantages—the conveniences of having an unfailing supply of electricity "on tap"—of making the home brighter—more cheerful; of making it possible to reap all the benefits of the latest developments in the radio and electrical fields. It will readily become apparent to them that electric light and power are no longer classed as luxuries but as absolute necessities. Until recently those people who lived out of reach of central line power stations could not obtain a practical and efficient generating plant without spending a large amount of money, and quite naturally, those who have limited means, had to continue using oil lamps and kerosene power—just as their grandfathers and great-grandfathers had done before them. WITH R.T.C. POWER LIGHT WE NOW MAKE IT POSSIBLE TO INSTALL ELECTRIC SERVICE BY FURNISHING R.T.C. POWER-LIGHT COMPLETE WITH 80 A.H. BATTERIES AS LOW AS \$284.00. This plant is capable of lighting 40 20-watt lamps for 5 hours or 24 such lamps continuously while the engine is running. With the engine quiet, however, the 80 ampere-hour bank of batteries will light 16 20-watt lamps for 5 hours or 10 such lamps for 8 hours. No one can afford to wait and continue to do without this necessity at this price. Oil lanterns are dangerous—they do not belong in the house. Get rid of the most serious fire menace on the farm or camp property—the kerosene lamp, by installing R.T.C. Power

Light. One fire will pay for a dozen such light plants.

### USED EXTENSIVELY IN FOREIGN COUNTRIES

R.T.C. Power-Light Plants, because of their ruggedness, dependability and economical operation have been exported to foreign countries for many years. People living in distant, or isolated points of the world where electricity is not as yet available have found that they can enjoy all the comforts and conveniences of great metropolitan areas by using our



power plant. Gasoline is cheap and is obtainable everywhere. Why not convert this cheap gasoline into electricity, the safest, cleanest and most economical way,—the R.T.C. way.

### R.T.C. POWER LIGHT SPECIFICATIONS

ENGINE: Water-cooled, Ford Ignition, speed 1200 R.P.M. one cylinder, 4-cycle stroke, 3-point sus-

pension, power pulley 3 inches diameter. COOLING: Thermos siphon water cooling system, copper radiator. GENERATOR: 32 or 110 volts (specify which) 4 pole, shunt wound, ball bearing, capacity 800 watts. SWITCH-BOARD: Starting switch, ammeter, automatic cut-out, fuse, etc. SHIPPING: Weight of plant only 250 lbs., with 80 ampere-hour battery bank 700 lbs., with 110 ampere-hour battery bank 850 lbs.

IMPORTANT: The batteries listed here with R.T.C. Power-Light plants are not an absolute necessity but are rather optional. They are, however, a great convenience, making it unnecessary to start up the generator when only small amounts of current is needed or when emergencies occur, requiring immediate electrical energy.

These Plants are designed for direct current. Get our price for A.C. plants.

R.T.C. Power Light will light the average farm, camp, summer home, etc., for one month for less than it costs to run an automobile fifty miles.

R.T.C. Power Light has a pulley by which several machines may be operated at one time. While these machines are running, the batteries are being charged for lights, etc., thus making the cost of operation practically nothing.

List Price \$255.00  
No. 4000 R.T.C. Power Light Plant for 800 Watts at 32 volts. Less batteries.

**YOUR PRICE \$203.00**

List Price \$265.00  
No. 4001 R.T.C. Power Light Plant for 800 Watts at 110 Volts. Less batteries.

**YOUR PRICE \$203.00**

List Price \$120.00  
No. 4002 R.T.C. Power Light Batteries Model J-80, 16 cells at 80 ampere hours capacity, 32 Volts; for use in conjunction with Power-plant No. 4000.

**YOUR PRICE \$31.00**

### Edwards High Frequency Buzzer



An excellent high frequency buzzer which can be employed in the construction of numerous radio testing devices, Capacitance Bridges, Ganging Oscillators, Neutralizing Oscillators, etc., to name but a few. Will operate on a single dry cell or on a 6 volt storage battery. Easily adjusted to give a pure high pitched note of excellent characteristics for use with radio circuits. Entirely nickel plated and polished. Shipping weight, 8 oz. Overall size, 2 1/2 x 2 1/2 x 3/4".

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No. 1670 High Frequency Buzzer.

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Complete Directory of All  
Commercial Wiring Diagrams

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- Modernizing old receivers
- Servicing obsolete sets
- Operating notes for Service Men
- Service Men's data
- Servicing automobile radio installations
- Curing man-made static
- Causes and cure of radio interference
- Notes on repairing "B" power units
- Constructional data on laboratory equipment

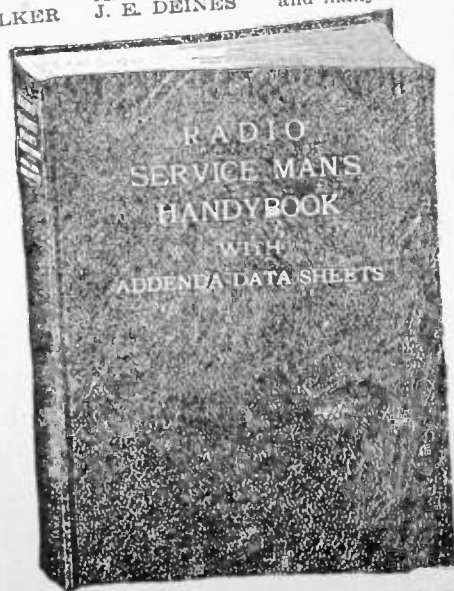
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- Servicing with the set analyzer
- What and how the Service Man should sell
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- All about vacuum tubes, and vacuum-tube data
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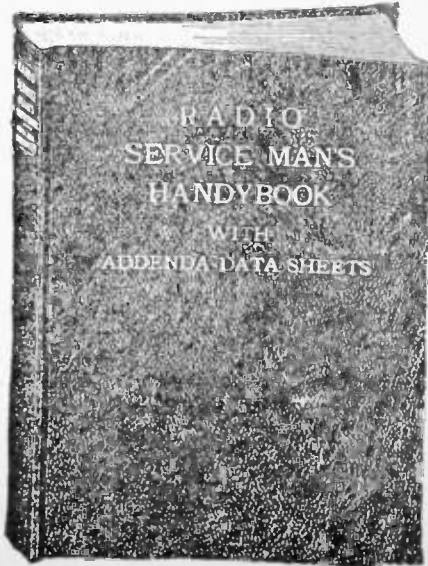
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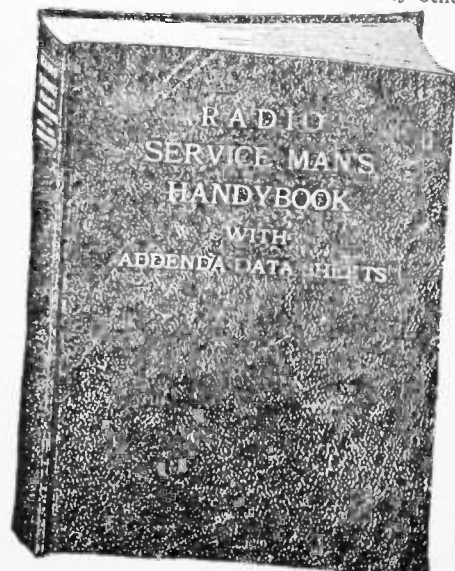
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# OFFICIAL 1932 RADIO SERVICE MANUAL

## A Complete Directory of All 1931-1932 Radio Receivers Full Radio Service Guide

HUGO GERNSBACK, Editor  
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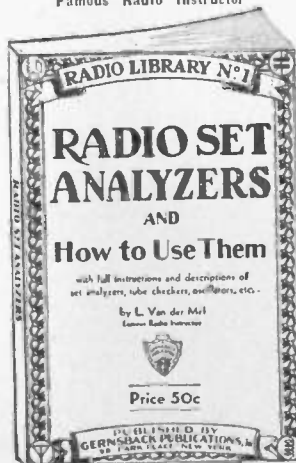
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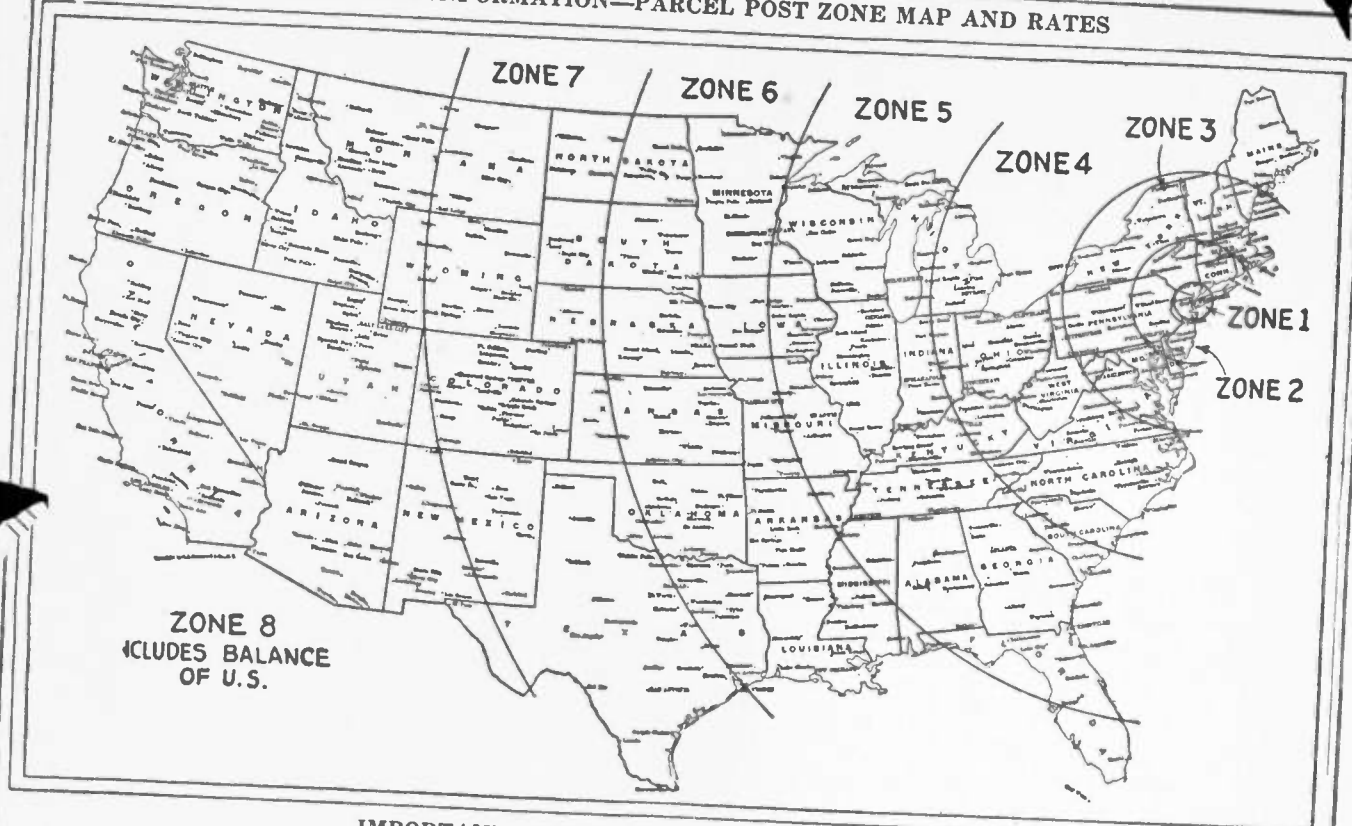
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"A" Elim. Condensers 43	<b>Dry Disc Rectifiers</b> 23	<b>Midget Electric Receivers</b> 42	<b>Service Bench Grinder</b> 63
"A-B-C" Power Packs 52, 54	<b>Dynamic Horn Units</b> 22, 23	<b>Midget Variable Cond.</b> 49	<b>Service Man's Handbook</b> 67
Adapters, Short Wave 20, 21, 54	<b>Dynamic Speakers</b> 58	<b>Midget Vernier Dial</b> 18, 19	<b>Set Analyzer Manual</b> 16
Adapters, Testing 28, 25	<b>Dynamic Speaker Cable</b> 58	<b>Milliammeters, DC</b> 61	<b>Sets, Automobile</b> 19
Addresses 54		<b>Motor Wrenches</b> 27	<b>Sets, Battery</b> 15, 16
All Wave Coil Kit 18, 19	<b>E</b>	<b>Motor Arbor</b> 63	<b>Sets, Midget Pentode Elec.</b> 57
Amplifiers, AC-DC 24, 25	<b>Earphones</b> 55	<b>Motor Generator Plant</b> 66	<b>Screw Assortment per race</b> 61, 62
Amplifiers, Power 17, 18, 59	<b>Electric Appliances</b> 61, 66	<b>Mountings, Resistor</b> 58	<b>Screw Drivers</b> 52, 54
Analizers 58, 59	<b>Electric Cable, 2-Conductor</b> 58	<b>Multi-Plug Power Cable</b> 58	<b>Short Wave Adapters</b> 52, 53, 54
Antenna Eliminator 58, 59	<b>Electric Clock</b> 65	<b>N</b>	<b>Short Wave Converter</b> 52, 53, 54
Antenna Equipment 58, 59	<b>Electric Cord Set</b> 65	<b>Neon Tubes</b> 29, 31, 56	<b>Short Wave Cyls. Coils</b> 52
Antenna Indoor Ribbon 58, 59	<b>Electric Cube Tape</b> 65	<b>Neutralizing Adapters</b> 21	<b>Short Wave Receivers</b> 53, 54
Antenna Insulators 58, 59	<b>Electric Current Converters</b> 25	<b>Nichrome Heater Wire</b> 61	<b>Short Wave Variable Cond.</b> 42, 52
Antenna Kits 58, 59	<b>D.C. to A.C.</b> 61	<b>Noise Eliminator</b> 58	<b>Short Wave Transmitters</b> 59
Antenna Lead-In Strip 58, 59	<b>Electric Grill Stove</b> 61	<b>Non-Directional Antennas</b> 62	<b>Socket Antennas</b> 59
Antenna Lightning Arrestor 58, 59	<b>Electric Hotplate Stove</b> 61	<b>Nuts and Washers</b> 62	<b>Socket Flange</b> 59
Antennas, Man. Directional 58, 59	<b>Electric Light Plant</b> 65		<b>Sockets, Tube</b> 57
Antennas, Socket 58, 59	<b>Electric Plug</b> 61, 65	<b>O</b>	<b>Socket Wrench Kits</b> 61, 62
Antennas Tension Springs 58, 59	<b>Electric Wall Outlet</b> 65	<b>Official Radio Carrying Case</b> 60	<b>Solder, Lead</b> 61, 63
Antennas, Umbrella 58, 59	<b>Electrolytic Condensers</b> 29	<b>Official Radio Serv. Manual 1931</b> 67	<b>Soldering Irons</b> 61, 63
Antenna Wire 58, 59	<b>Eliminators</b> 58, 59	<b>Official Radio Serv. Manual 1931</b> 67	<b>Soldering Lamp</b> 22, 23, 53
Anti-Capacity Switch 62	<b>Eliminator Antenna</b> 28, 59	<b>Connectors</b> 18	<b>Speakers</b> 51
Arbors, Motor 33, 36, 37, 62	<b>Exponential Trumpets</b> 58, 59	<b>Oil, Variable Condensers</b> 29	<b>Speaker Conls</b> 58
Audio Transformers 33, 36, 37, 62	<b>F</b>	<b>Oscillators, Testing</b> 23, 35, 36, 37	<b>Speaker Grill Cloth</b> 59
Audio Trans., Push-Pull 33, 36, 37	<b>Fahnestock Clips</b> 62	<b>Output Audio Trans.</b> 28	<b>Speaker Motor Units</b> 59
Audio Trans. Output 33, 35, 36, 37	<b>Feld Exiter, Horn Unit</b> 23	<b>Output Choke</b> 17	<b>Speaker Relay Switch</b> 59
Automobile Receiver 46	<b>Filament Switch</b> 56	<b>P</b>	<b>Speaker Units, Baldwin</b> 53, 57, 58
Auto. Spark Condensers 11	<b>Filament Transformers</b> 52, 54, 61	<b>Profile, Mirror Searchlight</b> 51, 60	<b>Stepdown Transformers</b> 51
	<b>Files</b> 61	<b>Probe, Mirror Searchlight</b> 51, 60	<b>Storage, Camera</b> 61
<b>B</b>	<b>File Handles</b> 61	<b>Probe, Audio Receiver</b> 16	<b>Store, Electric Hot Plate</b> 61
"B" Eliminators 26	<b>Filter Chokes</b> 29, 30, 41, 43	<b>Probe, Midget Receivers</b> 15, 16	<b>Sub-Panel Brackets</b> 62
"B" Elim. Condensers 43	<b>Filter Condenser Kit</b> 31	<b>Probe, Tubes</b> 29, 30, 31	<b>Sun Lamps</b> 59, 60, 61, 62, 63
Baffle Board, Cabinet 58	<b>Fluorobulb, ICA</b> 35	<b>Phone Tips</b> 25, 62	<b>Switch, Buzzer</b> 19
Balancing, Line 62	<b>Fluorobulb, Double</b> 35	<b>Phone Tap Jacks</b> 25, 62	<b>Switch, Snap On, Snap</b> 19
Battery Clips 62	<b>Fluorobulb, Single</b> 35	<b>Phone Tube, Meters</b> 27	<b>Switch, Snap On, Snap</b> 19
Battery Sets 17, 18, 19, 20	<b>Flexible Resistors</b> 47	<b>Phone, Pickup</b> 27	<b>Switch, Snap On, Snap</b> 19
Beede Meters 17, 18, 19, 20	<b>Fuses</b> 65	<b>Photo Searchlight Filter</b> 29, 31	<b>Speakers, Motors</b> 57
Bell Ringing Trans. 20, 39	<b>Fuse and Panel Clips</b> 65	<b>Photo Electric Cells</b> 29, 31	
Bell Rectifier 62	<b>G</b>	<b>Pickups, Phonograph</b> 39, 40, 43	<b>T</b>
Bending, Pads, Fahnestock 60, 62	<b>Generator Plant</b> 66	<b>Pistol Condensers</b> 39, 40, 43	<b>Tail Ribs</b> 61
Blox, Torch 60, 62	<b>Glowcoil Cores</b> 64	<b>Push Button</b> 11	<b>Tan Wrenches</b> 61
Brackets, Sub-Panel 62	<b>Gridleaks, Resistors</b> 47, 57	<b>Push Sealing Compound</b> 11	<b>Tap, Friction</b> 56
Bulbs, Pilot-Point 62	<b>Grinder, Service Bench</b> 58, 59	<b>Push, Electric</b> 61	<b>Telescope, Radio</b> 57
Buzzer, High Freq. 61		<b>Push, Electric</b> 61	<b>Television Receivers</b> 59, 60, 61
Buzzer, Switch 61		<b>Push, Electric</b> 61	<b>Television Tubes</b> 59, 60, 61
By Pass Condensers 59, 40, 41, 42, 43		<b>Push, Electric</b> 61	<b>Television Scanners</b> 59
		<b>Push, Electric</b> 61	<b>Test Lamp</b> 19, 61
		<b>Push, Electric</b> 61	<b>Test Lead</b> 19, 61
		<b>Push, Electric</b> 61	<b>Testing Adapters</b> 29, 31, 62
		<b>Push, Electric</b> 61	<b>Testing, Compensating</b> 60
		<b>Push, Electric</b> 61	<b>Test Kit, complete</b> 60
		<b>Push, Electric</b> 61	<b>Test, Radio</b> 60, 61, 62, 63
		<b>Push, Electric</b> 61	<b>Toggle Switch</b> 61, 62
		<b>Push, Electric</b> 61	<b>Time Controls</b> 60, 61
		<b>Push, Electric</b> 61	<b>Tubes</b> 29, 30, 31, 50, 57





## COLONAIRE

### Specifications

Cabinet: dark, full-grained American walnut beautifully designed. Chassis: cadmium plated, ultra-sensitive dynamic speaker, tone control, hum control, full vision dial ball-bearing tuning condensers. Tubes: 2-224, 2-225, 1-247, 1-281. Size: 59" high x 18" wide x 12½" deep. Clock: Capitol clock 6½" x 8".

Shipping wt. 40 lbs

List Price \$80.00

No. 2575—Perry Colonaire Receiver

**YOUR PRICE \$47.25**

Complete with 6 tubes  
(Perryman or Speed)

**\$49.95**

# MOST AMAZING VALUES IN RADIO!

## Perry Full-Sized Radio Receivers

**TONE! SELECTIVITY! POWER!**

**BRAND NEW 1932 MODELS**

**EMPLOYS SIX TUBES—SCREEN GRIDS—MULTI MU'S—PENTODES**

**N**EVER before—never in the history of radio has there been offered to the public such values as these! New 1932, nationally advertised radios of highest quality and design radically cut in prices. Not yesterday's radios, not today's—but TOMORROW'S; the finest radios that Perry Product, one of America's largest radio manufacturers, has ever produced. Only tremendous resources and brilliant technicians can build these sets at these exceptionally low list prices and only because of unthought-of market conditions can you buy them now at these dramatic reductions.

### NEW DISTINCTIVE FEATURES

Compare these features with those of other receivers at the same price: unexcelled tone quality with full range tone control; remarkably fine electro-dynamic speaker specially matched to the sets for perfect tone quality; speaker mounting and tone chambers scientifically designed for best musical reproduction; extreme ruggedness of chassis construction; complete shielding—every necessary unit fully protected against interfering signals and annoying whistles and squeals; and finally very short connections throughout the chassis—an assurance of better performance and trouble-free operation. Certainly, the outstanding feature of these excellent instruments is entertainment value. In this remarkably fine selection of two popular models you will find the most lasting radio satisfaction at a price within reach of all.

### INGENIOUS ULTRA-SENSITIVE CIRCUIT

Anyone who has any knowledge at all of radio is familiar with the marked advantages which the resistance-coupled receivers have over their transformer-coupled brethren;—sensitivity—discriminating amplification of all speech and music frequencies—elimination of transformer "cut-off" disturbances. The CONSOLETTETTE and the COLONAIRE (both have the same receiver chassis) employ resistance coupling throughout. Tubes utilized are as follows: 2-multi-mu 225 as first and second RF amplifiers, 1-224 screen-grid as third RF amplifier, 1-224 screen-grid as power detector, one super-power pentode as the power output stage and finally 1-280 fullwave rectifier. A UNIQUE ARRANGEMENT OF THE FOUR SCREEN GRID TUNED RF STAGES MAKES POSSIBLE THE USE OF ANY TYPE OR SIZE ANTENNA WITH EQUALLY EFFICIENT RESULTS. A Jensen full-dynamic speaker—impedance matched with the special dynamic output transformer—insures pure, mellow reproduction of music with remarkable fidelity of tone.

### CABINETS OF NEW CREATIVE DESIGNS

The Consolelette model comes in a beautiful low-boy cabinet of unusual artistic design made of selected golden grained American walnut. The Colonaire model is contained in a distinctive Grandfather's clock cabinet made of dark, full grained American walnut of unusual design. The electric clock on this model is a genuine Capitol instrument with the famous synchronous movement. The face is of light gold with black

embossed numbers. A seconds hand sweeps constantly around the face of the clock indicating at all times whether the current is on or off. Both sets designed for 50-60 cycle, 110 volts A.C., but may be had for 25 cycles 110-20 volts at an additional cost of \$1.50.



## CONSOLETTETTE

Cabinet: low-boy, golden grained American walnut.

Chassis: cadmium plated, ultra-sensitive dynamic speaker, tone control, hum control, full vision dial, ball-bearing tuning condensers.

Tubes: 2-224, 2-225, 1-247, 1-280.

Size: 39" high x 22½" wide x 13" deep.

Shipping wt. 50 lbs.

List Price \$65.00

No. 2560—Perry Consolelette Receiver

**YOUR PRICE \$33.40**

Complete with 6 tubes  
(Perryman or Speed)

**\$36.10**

**RADIO TRADING COMPANY, 25 WEST BROADWAY, NEW YORK, N. Y.**