

Radio

WIRELESS TELEPHONE
WIRELESS TELEGRAPH
EQUIPMENT



Reproduced by
KLIPSCH and ASSOCIATES, INC.
HOPE, ARKANSAS

With Permission from —

Montgomery Ward & Co.

Satisfaction Guaranteed or Your Money Back

Chicago Fort Worth Kansas City Portland, Ore. Saint Paul

copyright 1922, Montgomery Ward & Co.

DO NOT TRY TO ORDER FROM THIS CATALOGUE

Radio is today the wonder of the world. It has been so developed and simplified that it is very practical and useful. Radio messages from hundreds of stations are continually being sent out and radio receiving outfits have been so simplified that your own home can "listen in" on the radio programs sent out by the radiophone "Broadcasting Stations." Among the programs regularly sent out are, excellent musical concerts, latest news items of the day, time signals by which all clocks in the country are regulated, market reports giving up-to-minute quotations on stocks, bonds, cattle, sheep, hogs, grain and other produce. Besides this valuable information many special programs are sent out regularly. These include grand opera in season, complete theater programs, speeches by famous orators, sermons by well known churchmen, stories for the children, reports of athletic events while they are in progress, and many other items of interest.



Many radiophone "Broadcasting Stations" are now in operation and many more are being erected daily. Even now one or more radiophone programs can be heard in any part of the country by the more sensitive receiving outfits. Soon there will be so many broadcasting stations that even the ordinary receiving sets will have the choice of listening to several and the better outfits can be "tuned" to listen to any one of a dozen or more stations. Any station within range can be so "tuned in" that none of the others "interfere"—that is, none will be heard except the one wanted. You need not be an expert to do this. Any one, after reading the simple instructions sent with every set can set up a receiving station and receive messages without trouble.



MUSICALS

municipalities, newspapers and other agencies. These programs are a permanent feature in the country. In fact, they will be greatly extended so that every kind of interesting news will be sent out. Also,

It should be understood that it costs nothing to "listen in" on radio. Some of the programs are sent out by the big radio companies as an advertisement, others by schools, colleges, o t h e r s by



STOCK REPORTS



SERMONS

out the use of the

In this catalog will be found radio outfits to suit every pocketbook. Of course the sensitiveness, or receiving range of the outfit is usually in proportion to the price. The cheaper outfits will receive fairly well for short distances, while with the best outfits you can, under favorable conditions, hear radiophone transmitting stations a thousand miles or more distant.

However, it is not possible to state the distance messages can be heard under all conditions—the power of transmitting station, the geographical location, the season of the year, local atmospheric conditions, and even the time of day, all influence the range. A receiving set that under favorable conditions might easily "tune in" stations a thousand miles distant—might, under unfavorable conditions, only be able to receive stations a hundred miles away. However, with a good outfit you can always be assured of hearing something interesting.



NATIONAL EVENTS

In addition to radiophone messages radio-telegraph code messages from many parts of the country may be "picked up" almost any time. The range of transmitting and receiving sets is much greater on the radio-telegraph than on radiophone.



OPERA

While radio is extremely simple, it can be made a very deep study, and a very interesting one. We suggest that you order and study some of the radio books we offer. You will enjoy building your own set—the books tell you how. We carry a very complete line of parts to build not only receiving sets but transmitting sets as well. Learn the code—it requires but little practice. You will then be able to read all kinds of messages, not only from land stations but from the ships at sea.

You will then be able to read all kinds of messages, not only from land stations but from the ships at sea.

For fifty years Montgomery Ward & Co. have been serving their customers. Today we have more than five million. Before adding radio merchandise to our many other lines, we made certain of the quality of the goods we offer. Every type of machine in this catalog has been thoroughly tested.



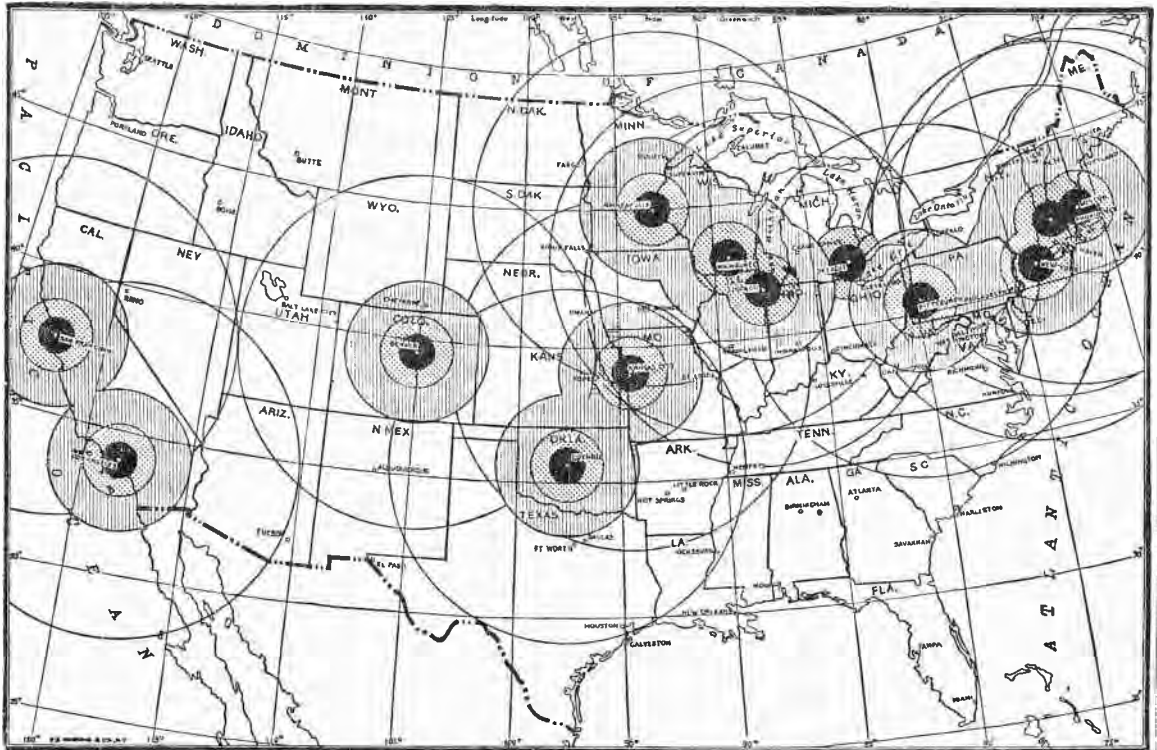
SPORTING EVENTS

Let Ward's be your radio headquarters. A copy of this catalog will be gladly sent to any of your friends who are interested in radio. Send us their names and addresses.

Montgomery Ward & Co.
(Established 1858—Headquarters of the Money Bag)

Chicago Ft. Worth
 Kansas City
 Portland, Ore. St. Paul

Leading Radiophone Broadcasting Stations



● 50 MILE RADIUS ● 100 MILE RADIUS ● 200 MILE RADIUS ○ 500 MILE RADIUS

In the descriptions of the outfits shown in this catalogue, we have tried to give an idea of how far messages can be received. However, a number of things influence the receiving range—the power of the transmitting station and local atmospheric conditions are the principal factors. Also, the range is much greater on clear winter nights than at any other time. The other extreme is a hot, stormy summer day. Where radio messages might carry a thousand miles in the first instance, they might only be effective for a hundred miles in the second. Radio always works better at night than in the daytime, and better in winter than summer. Local conditions also sometimes have an influence. For instance, some places are in a “shadow” or “pocket” for some stations, while they can hear others perfectly. As an example, it is usually difficult to send messages between Milwaukee and Chicago, while under the same conditions, either Milwaukee or Chicago may communicate perfectly with Detroit and Pittsburgh.

On the above map we show the location of the leading broadcasting stations (April 15, 1922). Others are in the course of construction and many more are contemplated.

It is expected that within a year or so, every spot in the country will be within range of several broadcasting stations.

Radio messages travel like waves in circles from the transmitting station. So that you can get an idea of the effectiveness of each station as concerns your particular receiving set, we have tried to show circular zones around each station, showing different distances.

The Radio Antenna or Aerial

is a necessary part of a receiving outfit. The most effective aerial consists of a wire or a set of wires suspended in the open air above all surrounding objects. From the aerial wire a “lead in” wire goes to the instruments. Both the aerial wire and lead in wires must be very carefully insulated from any object that might conduct electric currents from it to the ground. Aerial insulators (see Page 23) for the aerial wires are used for this purpose and the lead in wire is usually supported on porcelain knobs.

Best results for receiving are usually obtained with a single wire aerial ranging from 75 to 125 feet in length. Such an aerial will also receive stronger from stations toward which it is pointed, other conditions being equal.

Any of the aerial wire we list (see Page 23) is satisfactory, but the seven strand cable, 63 J 5150, is the best.

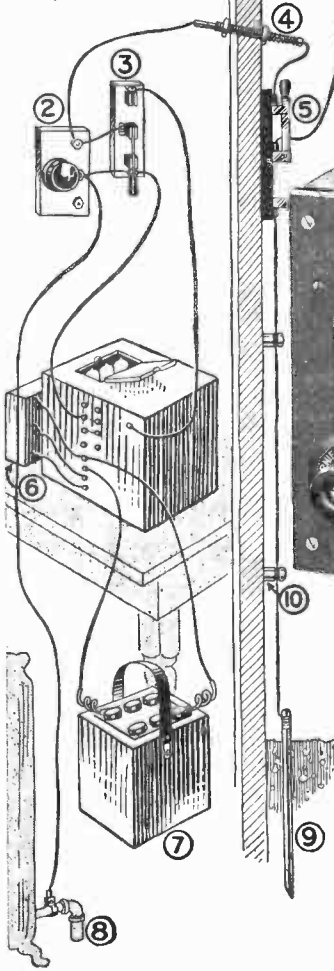
If it is not possible to put up a single wire of the length mentioned, a shorter one can be used, and under some conditions single wire aeriels as short as 35 feet give good results. Adding one, two or three wires stretched side by side, from 1 to 2 feet apart, improves short antennas somewhat.

Outdoor aeriels are not absolutely necessary. Wires stretched indoors often give satisfactory results. In fact, a very compact type of indoor aerial known as the Loop Antenna (see Page 23), gives excellent results with the more sensitive receiving sets, even on fairly long distance reception.

Complete Westinghouse R. C. Radio Outfit



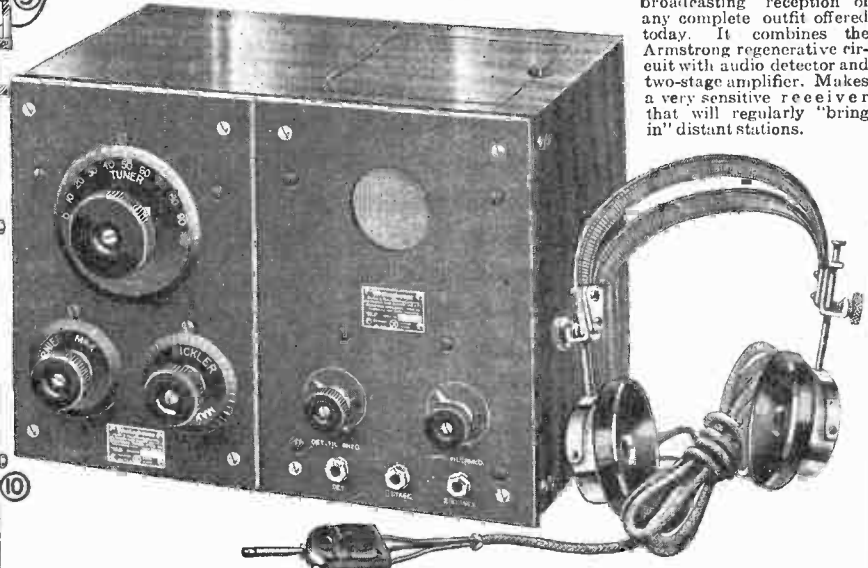
- 1-Air Cap Insulator
- 2-Lightning Arrester
- 3-Porcelain Switch
- 4-Wall Insulator
- 5-Grounding Switch
- 6-"B" Battery
- 7-"A" Storage Battery
- 8-Ground Clamp
- 9-Ground Rod
- 10-Porcelain Insulators



THE best medium priced, long distance Radio Receiving Outfit, and at the same time the simplest one to operate, is the Westinghouse "R. C." This receiver is manufactured by the Westinghouse Electric and Manufacturing Company, whose reputation for high grade electrical appliances is well known. The "R. C." receiver will give results equal to any receiver on the market today; it has none of the complicated, intricate adjustments so often found in the better types of receivers which require trained radio operators to handle. The "R. C." receiver is so simple that a beginner may secure perfect results with it.

Either a telephone receiver headset can be used to hear the signals, or a loud "speaker" may be connected so that a room full of people may be entertained. In fact, the messages may be so amplified with certain types of loud "speakers" that they may be heard at a distance of 100 feet or more.

The Westinghouse "R. C." outfit, properly installed, has the longest range for radiophone broadcasting reception of any complete outfit offered today. It combines the Armstrong regenerative circuit with audio detector and two-stage amplifier. Makes a very sensitive receiver that will regularly "bring in" distant stations.



MANY persons using these outfits in Chicago during the past winter have heard the radio programs sent out from New York. Of course nearer stations such as Pittsburgh, Kansas City and St. Paul are heard as well.

However, it must be remembered that no definite receiving range can be insured on this or any other radio receiving outfit; the range will vary according to atmospheric conditions, the season of the year, the time of the day and the power of the transmitting station. It is quite possible that during a hot, stormy summer day a station at Chicago that had regularly heard New York in the winter time would temporarily be unable to cover a distance of over 100 miles.

But, nevertheless, you will always be able to "pick something interesting from the air," and when conditions are right and you can hear a radio concert—say 400 to 500 miles distant, you and your family will be enthused with the wonders of radio and feel yourself well repaid for your efforts.

Picture this outfit in your home all set so that by a turn of the dial you receive from Chicago a grand opera concert, another slight turn and you tune

out Chicago and tune in the Detroit symphony orchestra concert; again a slight movement of the dial tunes out Detroit and you hear a lecture from Pittsburgh.

Right in your own home in the evenings after the day's work is over, with just a short aerial wire outside the house, messages and concerts are picked out of the air—no wire or other connection to any other place.

Not only have the things mentioned been sent out by radio, but market reports, stock reports, sermons, speeches, latest news items and other interesting programs are regularly broadcasted so that all within range of the transmitting station can hear. Dozens of new broadcasting stations are either being built or are in preparation. Within a short time stations will be located at comparatively short distances throughout the country. This means that anyone can always get at least one station by radio, and under favorable conditions any one of a dozen or more can be heard.

With such an outfit as this, each station can be tuned in separately and the others tuned out so they will not interfere.

The Complete Outfit Consists of:

1. Instructions for installation and operation.
2. The Westinghouse "R. C." set—which is fully described on opposite page.
3. One Western Electric 2200-ohm double headset with universal jack plug. (See Page 15 for complete description.)
4. One Radio Storage Battery, 6-volt, 80-ampere hour capacity.
5. One Radiotron Detector Tube.
6. Two Radiotron Amplifier Tubes.
7. One combination 45-volt "B" battery with 2 1/2-volt tap for the detector circuit.
8. A complete antenna equipment consisting of:
 - 150 feet stranded aerial wire cable.
 - 2 air-gap type, extra high grade aerial wire insulators.
 - 1 extra high grade wall insulator (see Page 23).
 - 1 600-volt, 100-ampere Radio grounding switch.
 - 25 feet No. 4 insulated ground wire.
 - 1 lightning arrester.
- 1 porcelain base switch.
- 8 large porcelain insulating knobs with screws.
- 2 screweyes.
- 1 ground clamp.
- 50 feet rubber covered connecting wire.
- 15 feet flexible cord to connect batteries to instruments, etc.

Shipping weight, complete outfit, 50 pounds.
563 J 621—Outfit, complete.

\$175.00

**Voc-
a-
rola
Loud
Speaker**

As stated, the "R. C." set can be used with a loud speaker to entertain a room full of people, but no loud speaker is included in the outfit.

Vocarola is the most satisfactory to use with this set. For entertaining larger audiences we recommend the Marnavox. See Page 14 for loud speakers.

Westinghouse D. A. and R. A. Radio Instruments

These two instruments, combined in one cabinet, make up the R. C. set shown on opposite page. They are supplied separately so that either can be used with radio instruments of other makes if desired.

Type R. A. Short Wave Regenerative Tuner

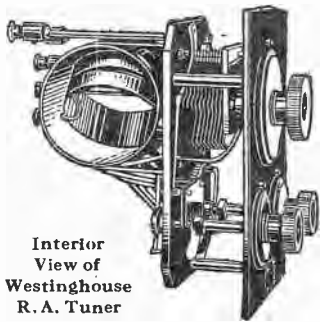
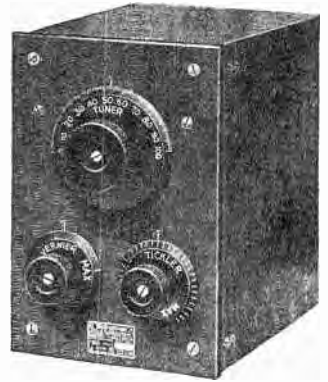
This is the instrument that takes the incoming radio wave collected on the antenna wire and "tunes" it so that the balance of the apparatus used can change the wave so it may be heard in the head receivers. In order that this "tuning" can be easily done by anyone, the instrument is made as simple as possible and requires but one adjustment in order to tune to the desired signal. The wave length range is from 180 to 700 meters, which means that amateur broadcasted and commercial messages may be tuned in. May be used either with a crystal or an audion detector, working alone or in conjunction with an amplifier.

TECHNICAL: This is a single circuit tuner and the oscillating circuit consists of a condenser of variable capacity and a variometer inductance connected in series. The rotating plates of the condenser and the rotating coils of the variometer are mounted on the same shaft (controlled by the large dial) and are so

balanced that rotating the one shaft changes simultaneously the inductance and capacity of the antenna circuit, thereby keeping the efficiency of the oscillating circuit practically constant throughout the entire range of the receiver. A single plate variable vernier condenser (controlled by lower left hand dial) is connected in parallel with the main condenser, and makes extremely fine tuning possible. Through the use of an adjustable tickler coil (controlled by the lower right hand dial), regenerative amplification may be used with a vacuum tube detector, which greatly increases the sensitivity and selectivity of the set. All connections are made at the back of the cabinet. Binding posts extend through the rear of the tuner and they are plainly marked by machine engraved insulating plates. The capacity effect of the operator's body on tuning is eliminated by means of a metal shield mounted on the back of the front panel, which is connected to the ground circuit.

Panel—Micarta, dull satin finish. **Cabinet**—Height, 9½ inches; depth, 8½ inches; width, 6½ inches. Solid mahogany, varnished and polished. **Dials**—polished black Micarta with beveled edges. Markings filled in white. **Condensers**—Rotary plate type, air, dielectric. **Wiring diagram** showing all connections is furnished, together with complete instructions for installing and operating. **Net weight, 6 pounds. Shipping weight, 10 pounds.**

563 J 622 \$68.00



Interior View of Westinghouse R. A. Tuner

Load Coil for Use with Type R. C. Receiver or R. A. Tuner

The addition of this coil to either the R. C. or R. A. instruments, increases the receiving range, making possible the reception of signals having wavelengths from 1600 to 2800 meters. It fits

readily attached to two binding posts at the rear of the cabinet. **Shipping weight, 1 pound.**

63 J 6301 \$6.00

Westinghouse D. A. Detector and Two-Stage Amplifier

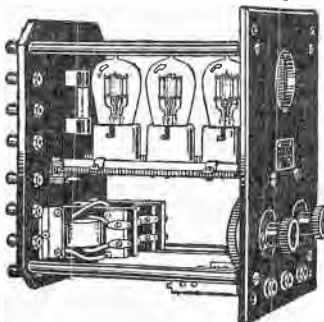
This instrument can be used in conjunction with any type of tuner—loose coupler, honeycomb coils or regenerative tuner. It is especially designed to work with the Westinghouse R. A. tuner and is the same size and shape, so that the two instruments can be placed side by side and present a very symmetrical appearance. It provides a vacuum tube detector and two stages of audio-frequency amplification. The results obtained with it are vastly superior to the results obtained by a crystal detector under the same conditions, the signals as given out by the second stage of amplification being at least one hundred times louder than on a crystal detector.

It is this type of instrument, used in connection with a regenerative tuner, such as the R. A. set listed above, that makes the wonderful results obtained by modern radio possible. Two such instruments working together have received radio telephone messages from stations one thousand or more miles distant. (See description on opposite page.) The current is first passed to the detector tube, from whence it passes on to an amplification transformer, which steps up the current and delivers it to the first amplifying tube. The incoming messages at this point are already greatly increased, but are further amplified by passing through another amplifying transformer, from whence the current is delivered to a second amplifying tube, and the current when delivered from this tube has been stepped up so loud and clear that messages even from far distant stations can be very distinctly heard, either in the telephone headsets or through the loud speaker. Two rheostats—one controlling the detector tube, the other controlling the two amplifier tubes, give perfect control of the filament currents. Three telephone jacks mounted on the panel enable the signal to be heard either by the detector or first or second stage of amplification by inserting the plug in the corresponding jack. All binding posts are located at the rear of this instrument, and are so arranged that direct wiring connections can be made with the R. A. tuner. The three sockets for holding any standard vacuum tube are mounted on a shockproof shelf which absorbs vibrations that would otherwise be transmitted to the tubes and introduce undesirable noises. **PANEL**—Micarta, dull satin finish. An opening protected by metal gauze, is provided for ventilation and permits the observation of the tubes in operation.

The cabinet is 9½ inches high, 8½ inches deep and 6½ inches wide, solid mahogany, varnished and polished. Door provided in top for ready inspection and replacement of vacuum tubes. The instrument is completely shielded on all sides, entirely eliminating capacity effects from operator's body. A wiring diagram showing all connections is furnished, together with complete instructions for installation and operation.

Net weight, 10 pounds. Shipping weight, 13 pounds. No batteries, no tubes nor head phones included.

563 J 624 \$70.00



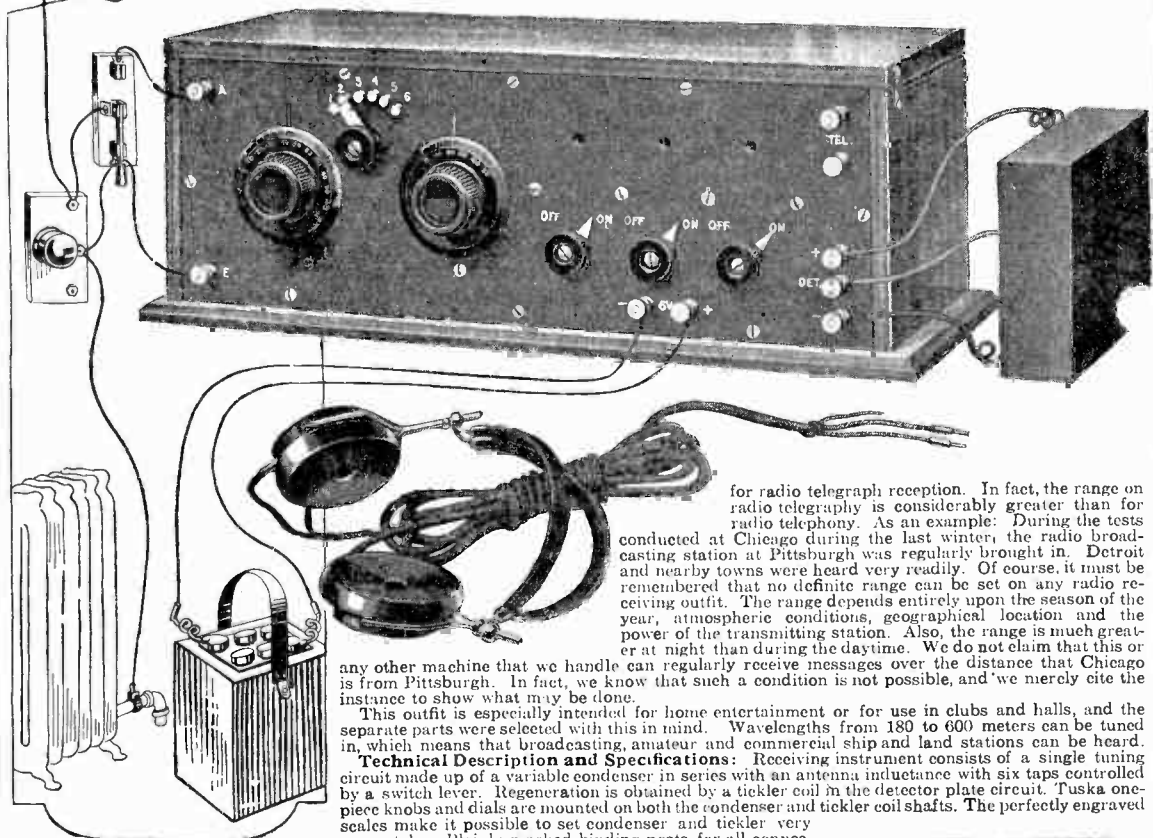
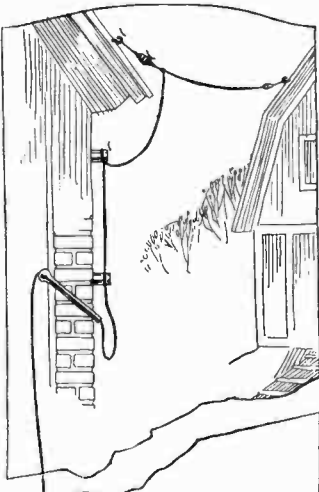
The Tuska Complete Radio Receiving Set

Including Regenerative Tuner, Detector and Two-Stage Amplifier
Easily Handled—Equal in Results to the
Best Radio Receiver

If you are looking for the best outfit that you can get at a reasonable price, this is the outfit you will want. We have selected it as being the best value offered today, after a thorough investigation of all radio sets on the market. The receiving instrument has been very carefully designed by several of the leading radio engineers in the country, and the result is an instrument equal in results to the best radio receiver of its type on the market.

A special effort was made to keep the instrument as simple as possible and yet incorporate the best features of the more complicated sets. The result is an outfit that is easy to handle, yet makes use of the new wonderful

radio developments, such as the Armstrong regenerative circuit and vacuum tube detectors and amplifiers. With this receiver, signals more than 100 times louder than those obtainable with any ordinary circuit and a single audion detector can be produced. This means that the instrument will pick up and reproduce distinctly messages from distant transmitting stations. It also means that you can use either a single or a series of telephone headsets; or, if you wish, you can connect to the instrument a loud speaker, so that an audience of any size can be entertained by the incoming radio program. While designed particularly for radio-telephone reception, the outfit is equally effective



for radio telegraph reception. In fact, the range on radio telephony is considerably greater than for radio telephony. As an example: During the tests conducted at Chicago during the last winter, the radio broadcasting station at Pittsburgh was regularly brought in. Detroit and nearby towns were heard very readily. Of course, it must be remembered that no definite range can be set on any radio receiving outfit. The range depends entirely upon the season of the year, atmospheric conditions, geographical location and the power of the transmitting station. Also, the range is much greater at night than during the daytime. We do not claim that this or any other machine that we handle can regularly receive messages over the distance that Chicago is from Pittsburgh. In fact, we know that such a condition is not possible, and we merely cite the instance to show what may be done.

This outfit is especially intended for home entertainment or for use in clubs and halls, and the separate parts were selected with this in mind. Wavelengths from 180 to 600 meters can be tuned in, which means that broadcasting, amateur and commercial ship and land stations can be heard.

Technical Description and Specifications: Receiving instrument consists of a single tuning circuit made up of a variable condenser in series with an antenna inductance with six taps controlled by a switch lever. Regeneration is obtained by a tickler coil in the detector plate circuit. Tuska one-piece knobs and dials are mounted on both the condenser and tickler coil shafts. The perfectly engraved scales make it possible to set condenser and tickler very accurately. Plainly marked binding posts for all connections.

Molded tube sockets. Highly efficient amplifying transformers. Filament circuits each controlled separately by finely graduated rheostats. Satin finish, machine engraved formica panel, fine quality mahogany finished cabinet, inside dimensions 6 by 6 $\frac{3}{4}$ by 17 $\frac{1}{2}$ inches.

The Outfit Complete Includes:

The tuner and detector two-stage amplifier, as described above; one detector; two amplifier tubes; 45-volt "B" battery with taps for detector circuit tube; 6-volt 40-ampere hour radio storage battery; high grade 2000-ohm headset; complete antenna equipment, consisting of 150 feet of bare copper aerial wire, 25 feet insulated wire for connecting to the ground, a single pole double-throw switch, a lightning arrester, 4 porcelain insulating knobs with screws, 2 aerial wire insulators, 2 screweyes, a porcelain wall tube and a ground clamp

Shipping weight, 45 pounds.
63 J 638—Complete outfit

\$115.00

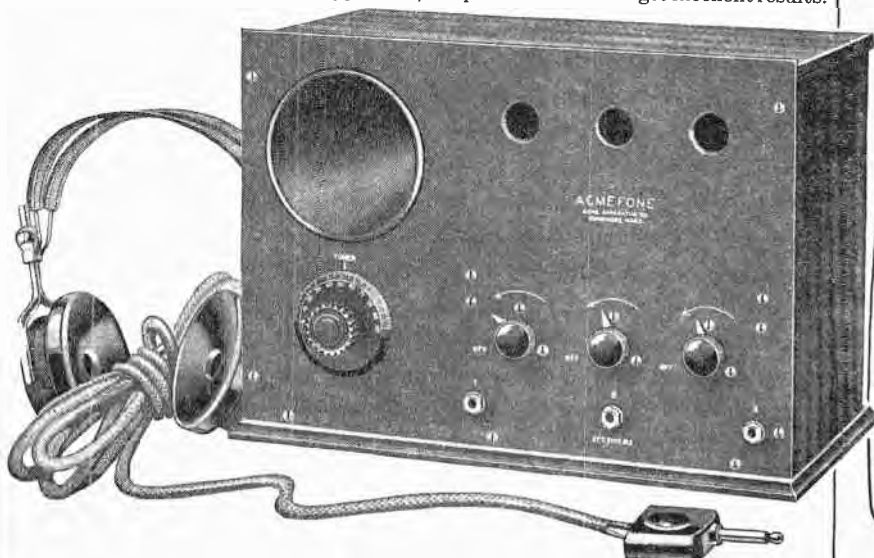
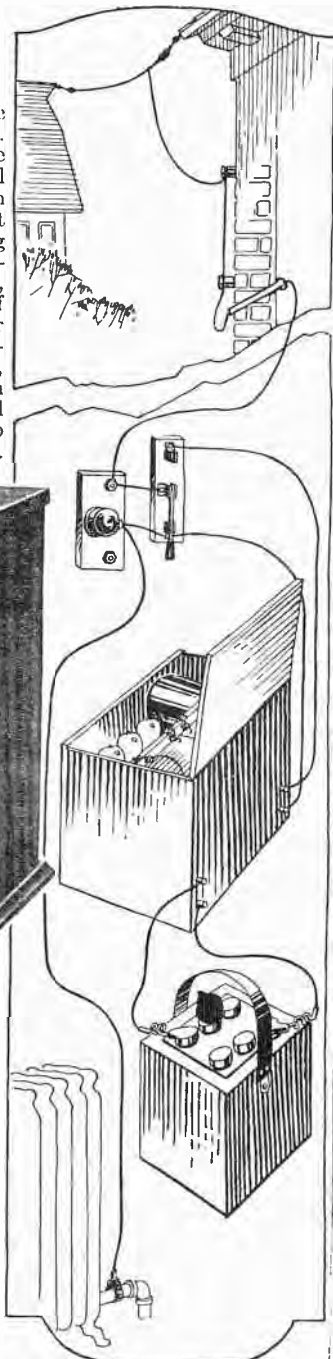
The equipment as listed above does not include a loud speaker. A complete line of loud speakers is listed on Page 20, and any of those shown will give very satisfactory results with this receiving outfit.



Acmefone Loud Speaking Radio Receiving Set

This receiver is fitted with a loud speaking device built right into the cabinet, which reproduces radio messages so that they can be distinctly heard all over any ordinary size room. This special feature makes this an excellent outfit to entertain small audiences in the home, club, church, hall, etc. Without any other attachments you can get music, lectures, news items, reports of sporting events, market reports, etc., from any transmitting station within the range of the instrument, which ordinarily is from 50 to 75 miles. However, we wish to make clear the fact that this instrument does not have as broad a range as some of the other types of

instruments, such as the Westinghouse R. C. and combination R. A. and D. A. sets, or the Tuska instruments. While we consider that this instrument will work satisfactorily at a range of from 50 to 75 miles and even farther, it must be understood that no definite receiving range can be stated on any radio receiving set—as geographical location, atmospheric conditions, the season of the year, the time of day and the power of the transmitting station entirely determine the receiving range. However, if you live nearby a transmitting station you will find this a very complete and satisfactory instrument. The control is so simple that a child can get excellent results.



Technical Description and Specifications:

To operate the Acmefone the three small knobs which control the "tubes" are turned clockwise until the tubes light up. After that all adjusting is done by means of the dial located beneath the loud speaker opening. This dial is simply rotated back and forth until the message wanted is plainly heard. The volume of sound can be easily controlled so that the music, speech, etc., comes through the speaking horn loud enough to be distinctly heard by every one in the room.

The receiver has a single tuning circuit, with a variable condenser in series with an antenna inductance. This circuit is directly connected to the detector circuit, to which is added two stages of amplification. The best grade tube sockets are used, and the transformers are the Acme make, which are recognized as among the most efficient. The loud speaker is connected to the second stage of amplification and has for its working unit a Baldwin type C amplifying unit directly connected to a sounding horn, which is very carefully worked out to give clear, pure tones. Provision is made to mount the "B" battery inside of the cabinet, so that the external connections are those that lead to the aerial, ground and storage battery. Genuine mahogany engraved formica panel. Jacks are provided in the detector, first and second amplifier circuits, so that any standard telephone headset can be plugged in either one of the three circuits; and when a receiver is in circuit the loud speaker is automatically disconnected.



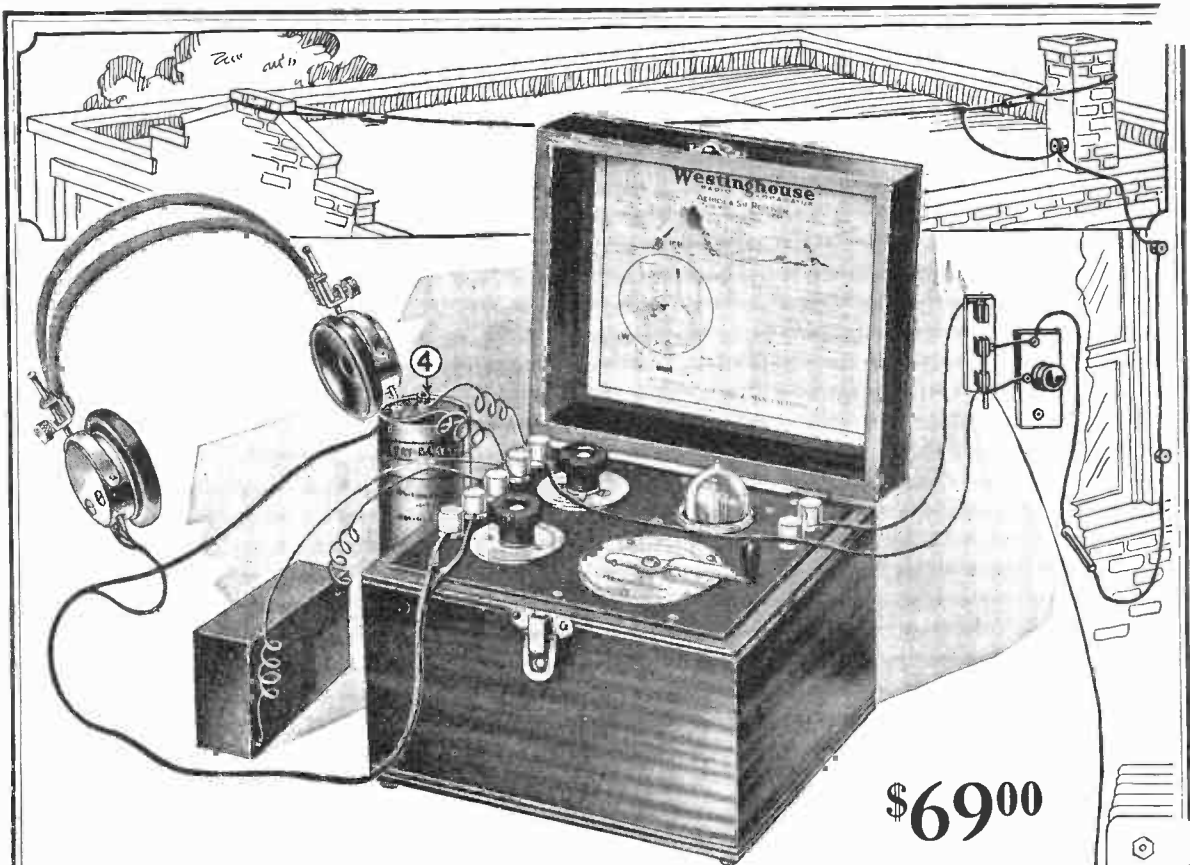
The receiver is in circuit the loud speaker is automatically disconnected.

The Complete Outfit Includes:

The Acmefone receiver as described; one detector tube; two amplifier tubes; two small size "B" batteries; one 6-volt 40-ampere hour "A" radio storage battery; one high grade 2000-ohm telephone headset with Universal plug, and 6 feet flexible connecting cord. Also a complete antenna equipment consisting of 150 feet of bare copper aerial wire, 25 feet insulated wire for connecting to the ground, a single pole double-throw switch, a lightning arrester, 4 porcelain insulating knobs with screws, 2 aerial wire insulators, 2 screweyes, a porcelain wall tube and a ground clamp.

Shipping weight, 45 pounds.
563 J 626—Complete outfit

\$119.50



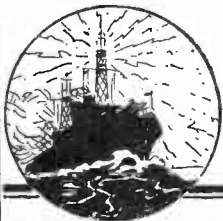
Westinghouse Aeriola Sr. Receiving Set

This receiving set is one of the latest and most advanced developments in the radio field. It is so simple to operate that a child can get good results with it. Its special features enable it to receive messages distinctly from far distant stations as well as any of the more complicated sets of the same type, and better than many of them. The special Armstrong circuit used multiplies many times the strength of the incoming signal. These sets used in Chicago during the last winter regularly received the radiophone concerts sent out from Detroit and often picked up Pittsburgh, besides many other nearby stations. It must be understood, however, that no definite receiving range can be given on any radio receiving set, as the local atmospheric conditions, geographical location, season of the year, time of day and strength of the transmitting station entirely govern the range of a receiving outfit.

The whole complete outfit is so compact and light in weight that it can be easily carried around, and because of its simplicity it can be set up and put in operation in just a few moments. The tuner, one single dry cell, a small "B" battery, one set of telephone head receivers and an antenna outfit make up the entire set, and the net weight is only 11 pounds.

This is a wonderful little outfit for home entertainment. It can be quickly set up in any room on a table, sideboard, etc. Make the connections and you can tune in to hear the radiophone programs, music, news items, market reports, stock reports, speeches, etc.

Because of its compactness and light weight you can easily move it about and give entertainments in your church, hall or your neighbor's house. In the summer when you make auto trips you can take this outfit along. Tie the antenna wires to a couple of trees or from a tree to your car. connect up the outfit and you are ready to "listen in." No matter where you may go you can pick something interesting from the air almost any time with this outfit.



SPECIFICATIONS: The tuner is of the single circuit type, the antenna circuit being tuned by a variometer; taps being entirely eliminated. A special condenser with leads giving two different capacities is provided. One connection gives wave length range of 180 to 350 meters, the other 300 to 500 meters. Regeneration is by means of a combination tickler coil and variometer mounted beside the antenna circuit inductance and connected in the plate circuit. Filament control rheostat gives very fine control of filament circuit. A grid leak and phone stopping condenser are also provided. Binding posts for all connections. Size over all of the containing cabinet, is 8½ by 7¼ by 7 inches.

The complete outfit includes the tuner, as described above; an Aeriotron detector tube, requiring only one single dry cell for filament circuit; Brandies 2000-ohm telephone headset receivers; one American 2½ by 6 inch size dry cell; one signal corps size "B" battery; complete antenna equipment, consisting of 150 feet of bare copper aerial wire, 25 feet insulated wire for connecting to the ground, a single pole double-throw switch, a lightning arrester, 4 porcelain insulating knobs with screws, 2 aerial wire insulators, 2 screweyes, a porcelain wall tube, and a ground clamp.

Shipping weight, 16 pounds. **\$69.00**
563 J 652—Complete outfit

Aeriotron Detector Tube

The detector tube supplied with the above outfit will give many months of service if properly used. The operator must be very careful not to apply too much current to the filament circuit. The filament should be lighted only a dull cherry red. Lighting beyond this point will burn it out very quickly. The current specifications for this tube are 1-volt filament, 20-volt plate. These tubes are of course very desirable for use in homemade receiving sets, but we cannot guarantee to fill orders except for those persons who have purchased Aeriola Sr. outfits from us, as the Westinghouse Electric Company are as yet only supplying tubes as renewals for their own outfit.

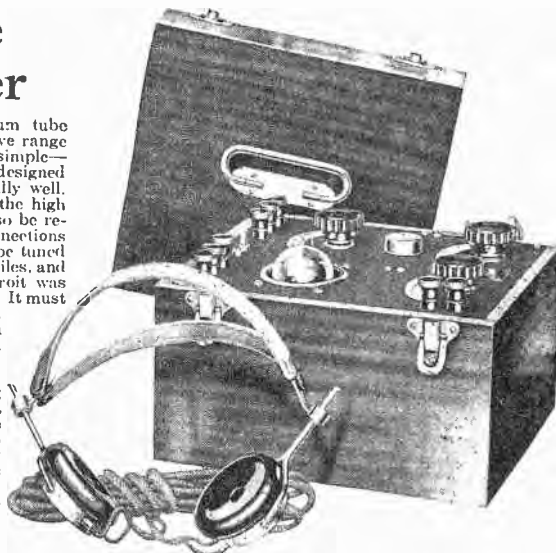
Shipping weight, 1 pound. **\$7.50**
563 J 5195



DeForest Radiohome Vacuum Tube Receiver

The tuner in this set is a really practical machine, using a vacuum tube detector. The outfit is high grade in every respect and has an effective range equal to that of many of the high priced outfits. The operation is very simple—after once being set only one adjustment is required. While especially designed for radiophone reception, it will receive radio telegraph signals equally well. The wave length range is 145 to 800 meters. Signals from any of the high power commercial stations working on the longer wave lengths can also be received. For this purpose standard honeycomb coils are mounted in connections provided, and with the proper selection of coils any wave length can be tuned in. The effective receiving range of this instrument is from 75 to 100 miles, and during tests conducted at Chicago the broadcasting station at Detroit was heard regularly and often the Pittsburgh station was brought in clearly. It must be understood, however, that no receiving range can be guaranteed for this or any other radio receiver, as the range depends entirely upon the power of the transmitting station, geographical location, local atmospheric conditions, season of the year and time of the day.

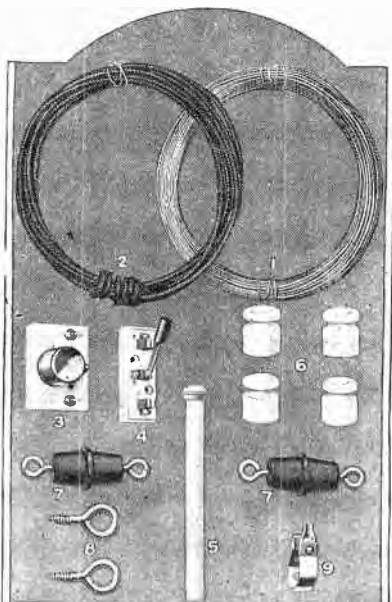
SPECIFICATIONS: The receiving instrument has a single tuning circuit made up of an antenna inductance directly connected with a vacuum tube detector circuit. The antenna inductance is tuned for the incoming wave by means of two sliding contact levers controlled by two knobs on the panel board. Detector filament current is controlled by standard DeForest high grade rheostat. The vacuum tube socket is molded. Binding posts mounted on panel board for all connections. Grid leak and grid condenser in detector circuit. The complete instrument enclosed in a neat walnut finished case, size 7 by 8½ by 9¼ inches.



The complete outfit includes: Receiver as described above; a 2000-ohm resistance high grade headset; one A. P. detector tube; one 6-volt 40-ampere hour storage battery; one "B" battery; complete antenna equipment, consisting of 150 feet bare copper aerial wire, 25 feet insulated wire for connecting to the ground, a single pole double-throw switch, a lightning arrester, 4 porcelain insulating knobs with screws, 2 aerial wire insulators, 2 screweyes, a porcelain wall tube and a ground clamp.

We recommend this outfit as being thoroughly satisfactory within its range, but of course it does not equal the results obtained when using the higher priced sets, which incorporate a regenerative tuner working in conjunction with a detector two-stage amplifier.

Shipping weight, complete outfit, 35 pounds. Complete instructions included. **\$62.50**
563 J 654—Complete outfit.....



Complete Antenna Equipment

Same as supplied with most of our receiving sets. Consists of 150 feet bare copper aerial wire, 25 feet insulated wire for connecting to the ground, a single pole double-throw switch, a lightning arrester, 4 porcelain insulating knobs with screws, 2 aerial wire insulators, 2 screweyes, a 12-inch porcelain wall tube, 20 feet of annunciator wire and a ground clamp.

Ship. wt., 8 lbs.
63 J 5156.... **\$3.50**

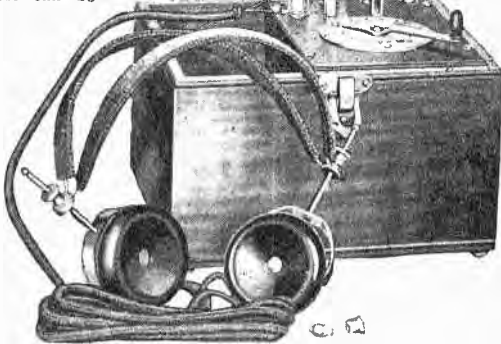
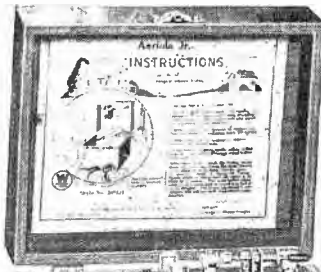
The tuning is effected by means of a variable inductance which is controlled by a lever which constitutes the only adjustment necessary, except for an occasional setting of the detector. The crystal detector changes the incoming current so that sounds are produced in the headset receivers exactly the same as they are sent out from the transmitting station. The outfit includes a high grade receiver set and complete antenna equipment, consisting of 150 feet of bare copper aerial wire, 25 feet insulated wire for connecting to the ground, a single pole double-throw switch, a lightning arrester, 4 porcelain insulating knobs with screws, 2 aerial wire insulators, 2 screweyes, a porcelain wall tube and a ground clamp. Connections are simple and easy and the outfit can be put into operation very quickly. Wave length range, 195 to 500 meters.

Shipping weight, 9 pounds.
563 J 656—Complete outfit..... **\$27.95**

Westinghouse Aeriola Jr.

Everybody Can Receive Wireless Messages With the Aeriola Jr.

The Westinghouse Company produced this outfit so that every American home can have a complete radio receiving set at a low cost. It has an effective receiving range of approximately 10 miles, and if you are located within that distance of a radio transmitting station you can receive messages distinctly. It will receive either radio telephonic or telegraph, and on radio telegraph its range is considerably more than 10 miles. Under favorable conditions it will receive telegraph messages from stations as far distant as 100 miles, and even more. The complete set can be easily installed, and it is so simple in operation that a child can get results with it. All the essential parts required to make an efficient tuner of this type are included.



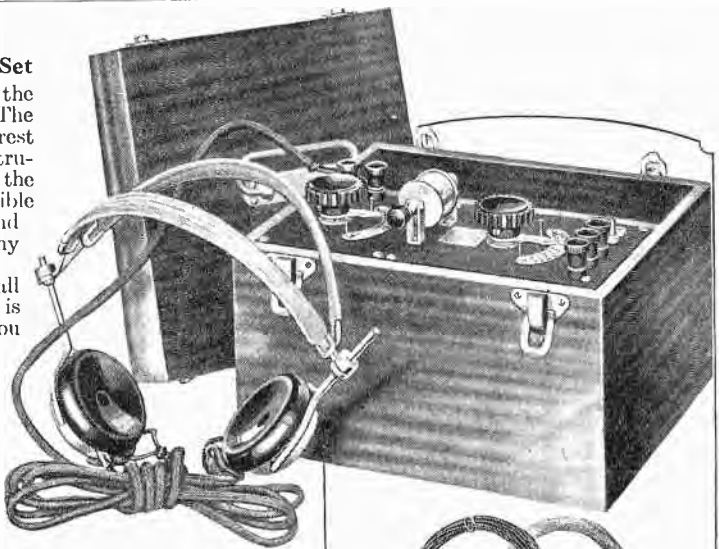
De Forest Everyman

Low Priced, Short Range Receiving Set

The name "DeForest" is famous the world over, wherever radio is known. The "Everyman" is a product of the DeForest laboratories and is one of the best instruments of the crystal detector type on the market. It is priced so low that it is possible for every home to have a radio outfit and enjoy the radio programs sent out by any broadcasting station within its range.

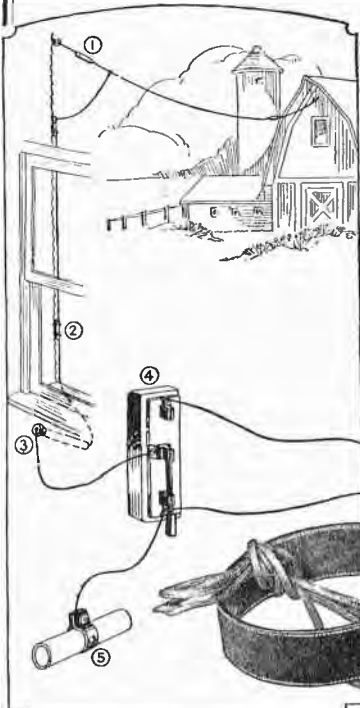
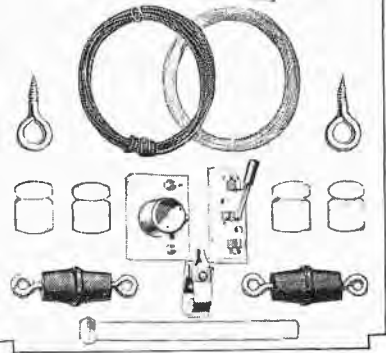
The range of this instrument, like all crystal detector type receiving sets, is limited to about 10 miles. That is, if you are within that distance of any transmitting station you can receive the radio-phonograph or radio telegraph messages sent out from that station. It will often happen, however, that you can pick up messages at a much greater distance than ten miles, and sets of this type have received code messages from stations as far as 100 miles distant, and even more.

This set consists of a tuning coil controlled by two knobs on the panel, so that the incoming message can be easily tuned by anyone. The current passes from the tuning coil to a crystal detector, which changes the current in such a manner that sounds identical to those given into the transmitter in the transmitting station are reproduced in the receivers. Binding posts are mounted on the panel for all connections. The wavelength range of the set is from 150 to 800 meters, but a special connection is provided by means of which honeycomb coils can be added to the circuit, so that the set will respond



to wavelengths up to 20,000 meters, enabling you to listen to the big commercial radio telegraph stations. The instrument is mounted in a handsome walnut finished cabinet, with carrying handle. A space is provided for honeycomb coils and receivers. Cabinet size is 10 by 8 by 7 inches; net weight, about 5 pounds. Shipping weight, 10 pounds. Complete set of instructions supplied.

63 J 658—Price, including a pair of 2000-ohm army type band receivers, and a complete antenna outfit..... **\$27.95**
See page 6 for specifications and description of the antenna outfit.



THE "heart" of these outfits, and the part most mysterious in its action, is the "crystal Detector"—from which the outfits are named. By means of this device, with the help of the "tuning coil", the incoming radio waves are changed in such a manner that speech, music, and other sounds, are reproduced in the telephone headsets to exactly correspond with the sounds given into the transmitter of the transmitting station. However, too much must not be expected of crystal Detector receiving outfits. They will do what we claim for them, but it should be remembered that they are the original type of radio receivers and cannot nearly equal the wonderful results produced by the more modern equipment, such as a regenerative tuner working in conjunction with a vacuum tube detector and two stage amplifier.

If you want a radio receiving outfit that will produce the best possible results, we recommend the Westinghouse R.C. outfit, listed on page 2, or the Tuska outfit, shown on page 4. Or if you want a real good set at the lowest possible cost, we recommend the outfit shown on the back cover. Any of these outfits will receive radio messages from far distant stations—stations entirely beyond the range of a crystal detector receiver such as the ones shown on this page.

Marvel Radio Receiving Set

Those people who live within 7 miles of a radio transmitting station of commercial power and wish to make only a limited investment in a radio set will find in this, the "Marvel", a practical outfit that will receive signals so that they can be plainly heard. It will receive radio telephone and radio telegraph equally well and its range on telegraph is somewhat greater than on telephone.

The construction of the outfit is very simple and with the material supplied it can be put into operation within a few moments. No batteries and no source of power are needed and there are no parts to break or wear out. The set includes a receiving tuner, with tapped tuning coil and crystal detector, single telephone headset, with leather covered headband and flexible connecting cord; and complete antenna outfit, consisting of 150 feet bare copper aerial wire, 5 porcelain insulators, single pole double throw switch. A code sheet and instruction booklet are also included. Shipping weight, 6 pounds.

63 J 659—Complete Outfit..... **\$15.00**

Tuska Expert Tuner—Type 220

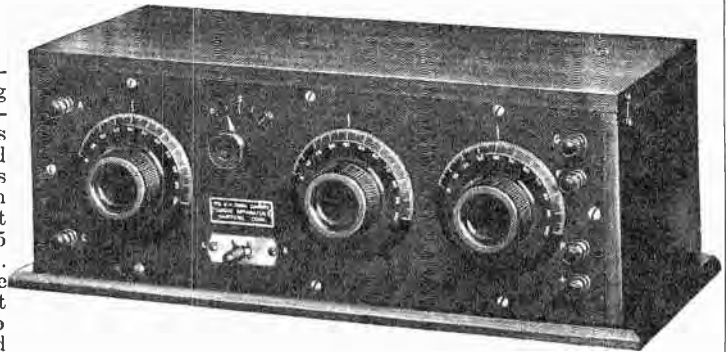
Wavelength Range, 150 to 800 Meters

(Licensed Under Armstrong Patents)

A complete super-selective tuner, designed especially for those persons desiring the most selective and effective tuning system available. This set is what is known as the three-circuit tuner, and the circuit used is of the regenerative type. All wavelengths from 150 to 800 meters can be covered with maximum efficiency. There are two distinct circuits, one with a range of 150 to 385 meters, the other from 375 to 800 meters. Change from one circuit to the other may be instantly effected by means of the 12-point jack switch, the connections to which are so arranged that there are absolutely no dead end or capacity losses from the long wave inductances. The hook-up is so arranged that taps on the primary of the coupler are avoided, which makes for more satisfactory operation. A lead shield is provided on the back of the panel, so that capacity effects from the hands and body of the operator are entirely eliminated.

Specifications

Antenna condenser, 43 plate, capacity .001 m. f. d., fitted with molded knob and dial, diameter 3 3/8 inches. Secondary tuning condenser, 13 plate, capacity .00025, fitted with molded knob and dial, diameter 3 3/8 inches. High grade Tuska molded plate variometer for regeneration, fitted with molded knob and dial, diameter



3 3/8 inches. Coupling control. Long and short wave change jack switch. Satin finished formica panel, size 6 by 17 1/2 inches. Polished nickel finished binding posts with machine engraved markings. Polished mahogany finished cabinet, inside dimensions 6 by 6 3/4 by 17 1/2 inches. All apparatus is directly mounted onto the panel so that all working parts can be removed from the cabinet in one unit. Shipping weight, 18 pounds.

563 J 668—Completely assembled with cabinet **\$75.00**
563 J 669—All parts complete, but unassembled and without cabinet. **41.50**
563 J 679—Cabinet only. Shipping weight, 8 pounds. **4.95**

Tuska Standard Receiver Type 222

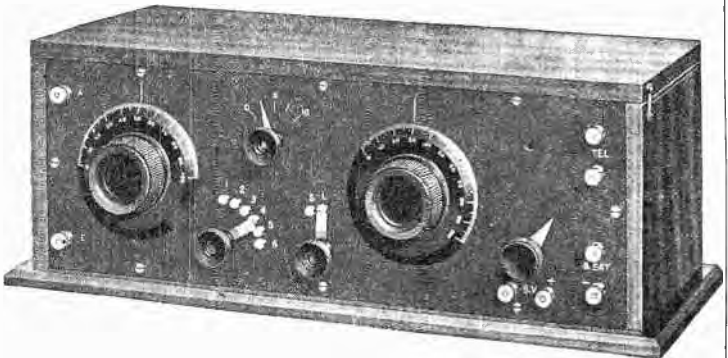
Wavelength Range, 150 to 800 Meters

(Licensed Under Armstrong Patents)

This is one of the finest radio instruments on the market. The circuit used is one of the most effective and the materials and workmanship are of the very best. It is a complete receiving set in itself, consisting of a tuner directly connected to a detector tube circuit. It is ready for operation upon the connection of aerial ground batteries, phone and tube. The standard receiver is comprised of an antenna inductance, secondary tuning condenser, plate variometer for regeneration, coupling control, long and short wave switch, grid condenser, rheostat and tube socket. The type of circuit and controls provided make this instrument very selective; in other words, you can more nearly tune in the station that you desire to hear without interference from other stations. While this set is very selective, it is not difficult to handle, and is recommended to the beginner or semi-experienced operator who desires a high grade complete outfit for radiophone or C. W. and spark code reception.

Specifications

Cabinet—Size inside, 6 by 6 3/4 by 17 1/2 inches. Fine polished mahogany finish. Satin finished formica panel, size 6 by 17 1/2 inches, with machine engraved markings. Variable condenser, 11 plate, capacity .00025, fitted with one-piece molded knob and dial, diameter 3 3/8 inches. Small capacity to enable very fine tuning. Antenna inductance with green silk windings wound on molded tube. Five taps controlled by switch lever. Variometer—High grade Tuska molded



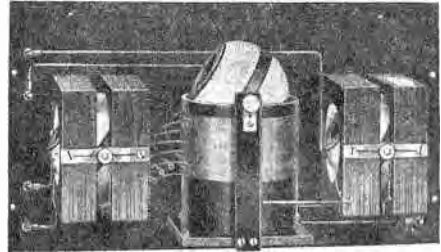
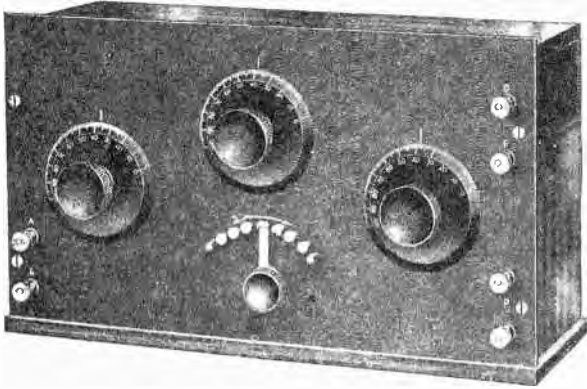
type with one-piece knob and dial, diameter 3 3/8 inches. Loading coils wound with green silk windings on molded tubes. Changes from short to long waves by means of switch lever. Short wave range, 150 to 385 meters. Long wave range, 375 to 800 meters. High grade filament control rheostat, grid condenser, tube socket. All connections by means of nickel finished binding posts plainly marked. All apparatus mounted on the panel, so that when panel is removed from cabinet the entire working parts are removed, permitting easy access to every part. Shipping weight, 18 pounds.

563 J 660—Wired complete **\$75.00**
563 J 661—All parts complete, but unassembled, and without cabinet. Shipping weight, 13 pounds. **39.50**
563 J 679—Cabinet only. Shipping weight, 8 pounds **4.95**
563 J 666—Two-step amplifier, same height and depth to match Tuska Standard Receiver. Polished mahogany finished cabinet. Binding posts arranged for direct connections. The second stage of this amplifier increases the audibility of the signal over the detector more than 100 times. Shipping weight, 9 pounds. **\$40.00**

The Demand for Radio Apparatus Is Greater Than the Supply

THE extremely heavy demand for radio materials is taxing manufacturers of radio apparatus beyond their capacity. Our highly efficient buying organization has been able to keep our stock practically complete, and your orders for our radio goods will be given prompt attention.

Short Wave, Long Distance Regenerative Tuner



The above illustration shows the very simple method of wiring used in this tuner. The circuit has been very carefully worked out to avoid complicated connections, thereby resulting in a set working at maximum efficiency.

This instrument makes possible the reception of messages to which other types of apparatus will not respond. The range is from 180 to 600 meters and by the addition of external loaders, such as the inductance coils listed on Page 20, this range may be raised as desired. Properly handled, signals may be read from stations at extreme distances or through heavy static and interference. The antenna and closed circuits are inductively coupled and the induction is variable. Regeneration is obtained by tuning both the grid and plate circuits to resonance with the incoming signal. Highest efficiency and amplification are obtained by reducing capacity and resistance in circuits to absolute minimum, and the best regenerative effects are secured by the use of properly designed variometers. These instruments are known as three-circuit tuners. They are not as simple to handle as some other types of tuners, but, properly handled, they give better results than any other type of tuner on short wave

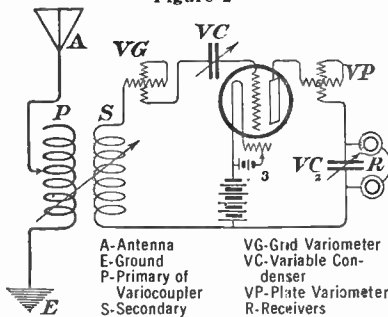
reception, such as radiophone broadcasting. Anyone can, with an hour's practice, handle these sets as effectively as an expert.

Specifications

The Inductive Coupler—consists of a primary, the inductance of which is varied by one 7-point switch, and a rotating secondary, by means of which arrangement very fine tuning is possible. Two Variometers,—tune both grid and plate circuits. High grade Dials and Knobs—fitted to variometers and couplers, finely graduated scales in contrasting white enamel. Inductance Switch—smooth working positive contact. Panel—condensite celleron, satin finish, size 7¼ by 14 inches, fine machine engraved. Binding Posts—polished nickel finish. Cabinet—solid walnut polished finish, 5 inches deep. Shipping weight, 10 pounds.

563 J 610 **\$35.00**

Figure 2



A—Antenna
E—Ground
P—Primary of Variocoupler
S—Secondary
VG—Grid Variometer
VC—Variable Capacitor
VP—Plate Variometer
R—Receivers

Figure 1

This diagram shows the circuit used in the above regenerative tuner. This circuit is generally considered as giving the best results of any of the regenerative circuits. The grid and plate are each tuned and are in one continuous circuit and not affected by the impedance of the receivers, as is the case in some other types of hookups.

Figure 2
Another type of Armstrong Regenerative Circuit. It varies from the circuit shown at right in that the receivers are placed in the same circuit with the grid and plate. This hookup gives effective results, but is not generally considered to be as good as that shown in Fig. 1.

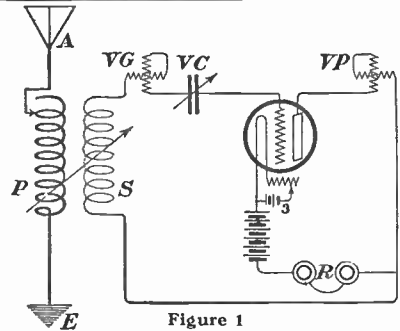


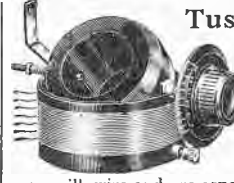
Figure 1



Tuska Molded Variometer

The stator and rotor forms of this variometer are molded of a special composition which cannot warp or shrink and will retain its shape indefinitely. The windings are molded into the stator form and wound upon the rotor form in such a way that they cannot come loose. Because of the materials used, this variometer produces maximum inductance with minimum distributed capacity. A very important point in the design is the clearance spacing between the rotor and stator. Many careful experiments were conducted to determine the correct spacing, with the result that the spacing used gives greatest possible efficiency. A very handsome appearing instrument in polished black finish. Binding post connection. Wavelength range, 150 to 500 meters; ¾ inches square by 1¼ inches thick. Shaft threaded ⅝. This variometer mounted on the brackets listed below and used with the special long shank dial with knob, provides the best mechanical and electrical variometer obtainable. Shipping weight, 4 lbs. **\$6.25**

63 J 6310	
63 J 6314	—Panel mounting brackets. Per pair.....	.35
63 J 6315	—Long shank dial with knob, 3-inch diam. ..	.95
63 J 6316	—Long shank 3¼-inch diameter dial with knob.....	1.48



Tuska Molded Variocouplers

The rotor and stator forms of these variocouplers are of molded composition. A very high grade article, perfect in design and construction. Secondary is wound on the rotating element. Primary is wound on the stator and has five taps which may be connected to switch points and the inductance varied by means of an inductance switch. The windings are of green silk wire and are especially designed for short wave work from 150 to 800 meters. Brackets are provided, which makes it easy to listen coupler to base or panel. The large sized coupler has the secondary directly centralized in the primary winding which insures maximum coupling. The secondary of the smaller size is mounted above the primary winding and has slightly less coupling. Shipping weights, 2 and 3 lbs.

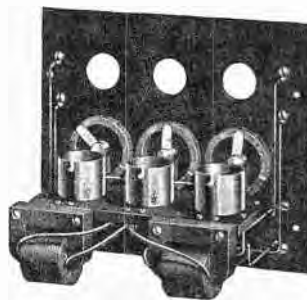
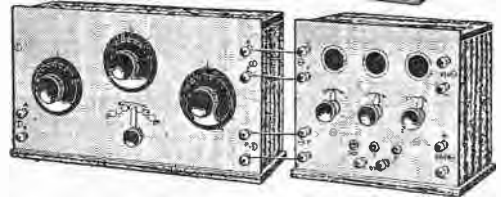
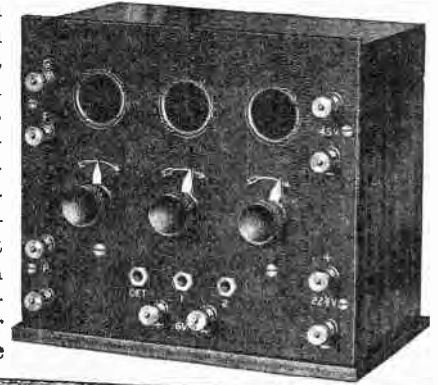
63 J 6311	—Small size coupler. Without dial.....	\$6.00
63 J 6312	—Large size coupler. Without dial.....	7.50
63 J 6727	—Molded dial and knob with 90° scale and ⅝ insert to fit coupler shafts.....	.95



Detector and Two-Step Amplifier

This is a very compact, well arranged instrument, neat in appearance and very efficient in results. It can be used in connection with any type of tuner on the market, but most efficient results are obtained on the short wave reception when used in conjunction with any first class three-circuit regenerative tuner. It is especially designed to work in conjunction with our regenerative tuner and matches it perfectly in appearance. Has one detector and two audio frequency amplifying circuits. Grid condenser in detector circuit. The amplification transformers used are the most efficient available and produce maximum amplification with any standard amplifier tubes. Standard tube sockets mounted on shelf. Provided with jacks so that either receiver headset or loud speaker can be connected in on any of the three circuits. One plug to fit jacks included. Satin finish bakelite panel; 7½ inches high, 8¾ inches wide. High grade solid mahogany cabinet, polished finish, with hinged top, making interior easily accessible. Binding posts polished nickel finish, plainly marked for all connections. Arranged to use separate "B" battery in detector and amplifier circuits. No tubes, batteries or phones included. Shipping weight, 10 pounds.

563 J 615 \$35.00



The illustration at the left shows the very simple arrangement of this set. The wiring circuit has been very carefully worked out so that howling, due to induction between wires, is entirely avoided. A mechanically and electrically well designed and well made set.

This illustration shows how our regenerative tuner and Ray-de-la detector and two-stage amplifier can be connected together. Binding posts are arranged so that connections are direct without unsightly wiring. These two units working together are capable of producing results equal to the best sets on the market. They are very sensitive and efficient. Connected to a good outdoor aerial, their range is limited only by the power of the transmitting station, and stations hundreds of miles away have been regularly heard. Very good results are obtained with indoor aerials such as the one listed on Page 23. The range, of course, is not equal to the range when connected with a good outdoor aerial; but for use in cities where it is desired to listen in on a local broadcasting station, an indoor aerial is very convenient. Not only is it unnecessary to have any outdoor wiring, but interference from other stations can be greatly reduced, due to the fact that a loop aerial such as this, can be directed toward the station from which signals are desired, and signals from other stations are greatly reduced and even entirely eliminated.

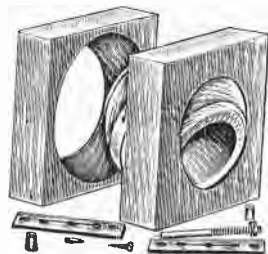
Variometers



A high grade variometer. The stator and rotor forms are made of kiln-dried wood and will not warp nor shrink. The winding ratios are properly calculated, so that when using two of these variometers in conjunction with the loose coupler quoted at the right, very efficient results are obtained. These instruments, together with the proper binding posts, dials, knobs, etc., can be made up into a very efficient set at a low price. Variometers can also be used separately for

grid and plate tuning in any audio or radio frequency tuner. Designed for very low dielectric losses and maximum range of inductiveness. Rotor element contacts are made through a flexible cable, soldered firmly onto the rotor shaft and securely connected to the binding posts. Solidly built; ¼-inch shaft. Shipping weight, 2¼ pounds.

63 J 5640 \$4.45



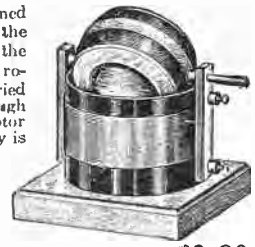
Variometer Parts

Consists of a complete set of parts for making a first class variometer. Set consists of two stator forms, one rotor, and the necessary metal shafts, bearings and screws to complete the instrument. No wire is included, so that you can arrange the windings to suit your own ideas. A wooden form for the rotor windings is included. Coils are first wound on form and then slipped into the rotor. Wood parts made of genuine solid mahogany. Shipping weight, 1½ pounds.

63 J 6322 \$1.90

Variocoupler

A high grade loose coupler, designed especially for use in conjunction with the wood frame variometers, quoted at the left. The secondary is wound on a rotating element turned out of kiln-dried wood. Connections are made through cables firmly soldered onto the rotor shaft and shaft support. The primary is wound on a bakelite tube and has seven taps which can be connected to switch points and the inductance varied by means of a switch lever. Mounted on a wooden base; ¼-inch diameter shaft. Shipping weight, 2¼ pounds.



63 J 5642 \$3.80

Variocoupler Parts

Includes all necessary parts except wire, to make a high grade variocoupler. Secondary is wound on the wooden rotor; primary is wound on a formica tube and can be tapped at any point. Brass shafts, bearings and connecting screws finish ready to assemble. No wire included. Shipping weight, 1 pound.

63 J 6325 \$1.38

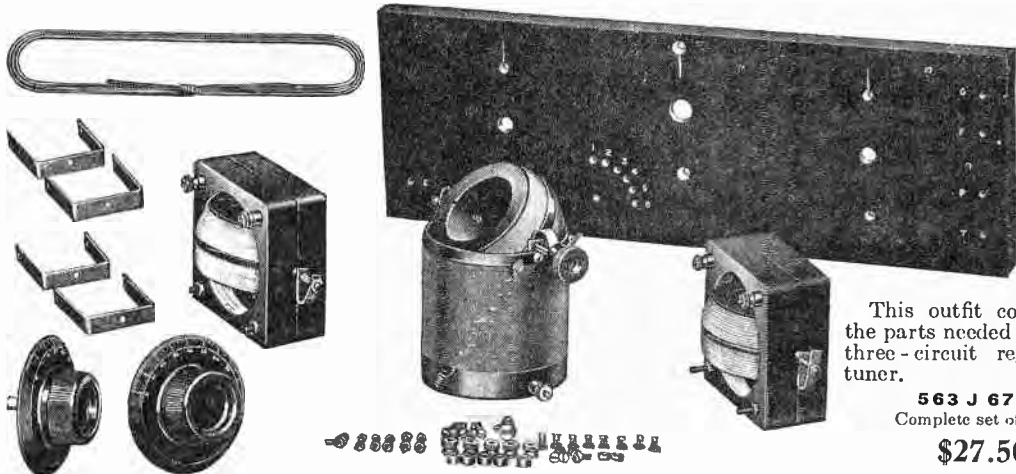
63 J 6326—Rotor ball only .38

63 J 6327—Stator tube only .38



It is not difficult to construct radio apparatus. On this and the following pages we show a complete line of radio parts. From the parts shown practically any type of radio apparatus can be constructed. The cost is much less than when the complete set is purchased, and the building up of the parts is very interesting and instructive.

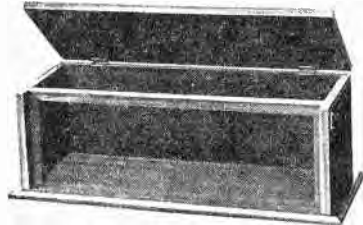
Knocked Down Regenerative Tuner Set



This outfit contains all the parts needed to make a three-circuit regenerative tuner.

563 J 678—
Complete set of parts
\$27.50

Furnished complete with two variometers, variocoupler, switch lever and contact points, dials, connecting wire, binding posts and panel. The panel is 6 inches high and 17½ inches long. It is drilled with proper size holes correctly located and plainly marked, so that all parts can be easily assembled in the proper relative positions to make a solid high grade instrument. The variometer and variocoupler are the Tuska molded type and are the best instruments of their kind. The dials are very neat, being molded in one piece with the knobs. Numerous wiring circuits can be used. Figure 1 shown on Page 10 is generally considered as giving the best results, and when this circuit is used the wavelength range is from 180 to 500 meters. Cabinet not included. Shipping weight, 10 pounds.



Cabinet to take above outfit. Made of solid genuine mahogany, polished piano finish. Inside dimensions: Six inches high, 6¾ inches deep, 17½ inches long. Hinged top. Shipping weight, 8 pounds.

563 J 679 \$4.95

How to Make a Regenerative Tuner

Complete instructions with drawings on how to make a regenerative tuner with a range up to 800 meters. The type of tuner described has a .001 MF variable condenser, a tapped inductance and a tickler coil. This type of set, because of simplicity of operation and good reception, is becoming very popular. Easy to build. All parts used are listed in this catalogue. Shipping weight, 4 ounces.

- 63 J 6340**..... 35¢
- 63 J 6342**—Primary inductance tube for use with above set. Size, 4¾ inches diameter by 5½ inches long. Ship. wt., 2 lbs. . 35¢
- 63 J 6343**—Tickler tube, size 3 in. diameter, 2¾ in. long. Shipping weight, 2 pounds. 30¢
- 63 J 6344**—No. 23 green single silk covered wire for above set. Four ounces for. 60¢

How to Make Detector and Amplifier Units

Complete instructions with drawings on how to make detector and amplifier units. These units are very similar in design to the units listed on Page 13. They are arranged so that they can be wired together to make a detector and two or three-stage amplifier. All materials required are listed in this catalogue. Ship. wt., 4 oz. **35¢**

160 to 1,000 Meter Armstrong Improved Regenerative Tuner. Using Variable Condensers

Designed for amateur relay stations, being especially efficient on wavelengths from 160 to 400 meters, and giving approximately a regenerative amplification of 100 through the entire wavelength range. Receiver is free from body capacity effects even when receiving C.W. signals. Replaces the two-variometer tuners. Shipping weight, 4 pounds. **\$2.40**

63 J 6332—Per set of four blueprints

150 to 3,000 Meter Armstrong Single Circuit Regenerative Tuner

This design has three distinct advantages over any single circuit receiver now made. First: The ratio of inductance to capacity is variable and can be adjusted for maximum results. Second: Variometers which are inefficient at their lower wavelength ranges are eliminated. Third: Combined inductive regeneration and tuned plate circuit is employed for maximum regenerative amplification. Shipping weight, 2 pounds. **\$1.20**

63 J 6334—Per set of two blueprints

Blueprints of Receiving Sets

These blue prints show in detail how to construct various types of receiving instruments. They give exact complete construction details of each part required and wiring diagram of connections.

150 to 25,000 Meter Armstrong Regenerative Tuner.

Designed for the experimenter who desires to cover the entire range of wavelengths now used by all classes of stations and still secure maximum efficiency over the entire wavelength range. This uniform efficiency is obtained by using a specially designed switch which permits the proper adjustment of the capacity inductance ratio for maximum grid voltage, and eliminates losses in unused portions of the inductances. Regeneration is provided inductively on the lower wavelengths and conductively on the longer wavelengths. Shipping weight, 3 pounds.

63 J 6330—Per set of three blueprints **\$1.80**

Detector and Three-Stage Audio Frequency Amplifier

Designed especially for use with the below 160 to 850 and 150 to 3,000 meter Armstrong regenerative receivers and having all latest advantageous features. Provision is made to use a soft tube potentiometer "B" battery adjustment, plate tuning circuit, filament ammeter, and the changes from one stage to any of the other stages is effected through a single switch, this switch also automatically controlling the filament circuits. The new Radio Corporation Amplifying Transformers are used and insure maximum results. Shipping weight, 4 pounds.

63 J 6337—Per set of four blueprints **\$2.40**

160 to 850 Meter Armstrong Super-Autodyne Receiver

This receiver, the very latest development in short wave reception, is used extensively by commercial radio stations to handle ship traffic. Used in connection with a small indoor loop antenna, it is possible to eliminate at least one-half of the total interference through the directive qualities of the loop. An additional advantage when using loop antenna is that maximum received energy is obtained from the desired station because of the directive feature of the loops. With this circuit it is possible to use resistance coupled amplification for short wave reception, and finally two stages of audio frequency amplification.

In laboratory tests, small powered 200 meter C.W. stations 500 to 1,000 miles away have been heard, not only loud enough to read but readable five to ten feet from the phones. On 600 meters it is not unusual to hear a 2 K.W. ship station 1,500 to 2,000 miles distant. Shipping weight, 4 pounds.

63 J 6336—Per set of four blueprints **\$2.40**

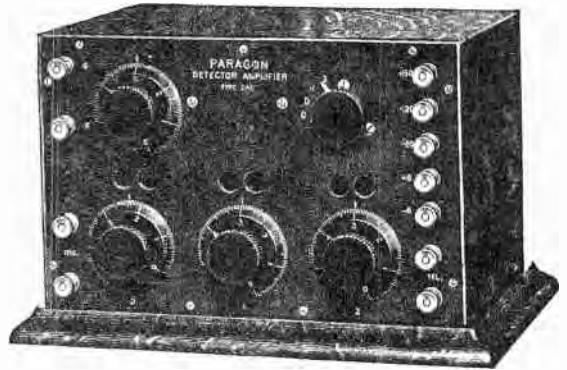
Detector and Two-Stage Amplifier for Tuner 63 J 6336

The mechanical arrangement of this instrument is symmetrical to the above receiver and the electrical constants selected for best mutual relations. Change from detector to either step of amplification is obtained through plug and jacks. Provision is made to use a "soft" gasous detector tube, but only using one "A" and one "B" battery and the "B" potential applied to the detector tube is variable. Shipping weight, 3 pounds.

63 J 6338—Per set of three blueprints **\$1.80**

Paragon Detector Two-Stage Amplifier, Type DA2

We have selected this as being the highest grade instrument of its kind on the market. A most efficient hookup is used and the parts and workmanship are of the very best. Overall amplification with this amplifier is at a maximum. It is free from howling and tube noises. May be used in conjunction with any tuner on the market and is especially arranged for direct connection with regenerative tuners. Grained finish formica panel, size 6½ by 10¼ inches. Perfect machine engraved lettering, white filled. All metal parts polished nickel finish. Case is of heavy quarter sawed oak in a fine dull, dark rubbed finish. Top is hinged, giving a quick, easy access to the interior. Filament circuit of detector tube is provided with both controlling rheostat and a 300-ohm potentiometer, which permits of very fine adjustment necessary in the modern critical tubes. Detector circuit is also provided with an adjustable grid leak. Rheostats and potentiometers are all controlled by dial indicators, which are superior in operation and appearance to the usual unsightly knobs. Each circuit may be separately connected to the receiver, headset or loud speaker. A special stage controlling switch progressively lights filaments and transfers telephone connections. No jacks or plugs are used. The amplifying transformers used are the best available. All connections are made with heavy wire, neatly arranged and enclosed in insulating tubing. No tubes, batteries or phones included.



Shipping weight, 12 pounds.
563 J 682 \$65.00



Detector Panel in Cabinet

This unit is so arranged that any type of detector circuit can be used. Satin finish condensite celloxon panel. Fine finish oak cabinet with hinged top. Binding posts for all connections. High grade filament control rheostat. Molded tube socket to take any standard tube. Grid condenser in grid circuit. Shipping weight, 3 pounds.
63 J 6354 \$7.95

Amplifier Unit in Cabinet

This instrument is arranged to work in conjunction with the above detector unit in cabinet. Binding posts are arranged for straight wiring connections between detector and amplifier. High grade filament control rheostat. Molded tube socket to take any standard tube. Very efficient amplifying transformer. Satin finish condensite celloxon panel. Oak cabinet, finely finished. Produces results equal to the highest grade amplifier unit. Shipping weight, 4 pounds.
63 J 6356 \$12.15



Detector Unit

This is a very efficient detector unit. Satin finish condensite celloxon panel mounted on wooden base, size 3½ by 6 inches. Binding posts with insulating knobs for all connections. High grade filament control rheostat. Molded tube socket to take any standard tube. Grid leak condenser in grid circuit. The wiring is arranged so that any type of vacuum tube circuit can be used. Shipping weight, 2 pounds.
63 J 6350 \$5.50



Paragon V. T. Control Panel

This is a real Utility Device, for it may be used either for detector control, for amplifier control, alone or in cascade; and for the control of power tubes either singly or in groups.



The indestructible condensite base is molded and has a beautiful, glossy black finish. In the base is mounted a standard V. T. socket (laminated contact springs), a paragon rheostat (6 ohms, 1½ amps.), a mica grid condenser of just the right capacity, an adjustable grid leak of the "pencil mark" type, and nine terminal posts which instantaneously adapt the unit to any known vacuum tube circuit. Metal fittings are polished nickel. Insulating qualities of base are very high; base is heatproof. Unit may be used in any position. Overall dimensions, 5 by 3½ by 1¾ inches. Shipping weight, 2 pounds.

63 J 5108 \$6.00

Amplifier Unit

A very effective amplifier unit, designed for use in connection with the above detector unit. Satin finish condensite celloxon panel, size 3½ by 6 inches. Mounted on wooden base. Binding posts arranged for straight wire connections to our Detector Unit. High grade filament control rheostat, molded tube socket. Very efficient amplifying transformer. A detector unit and two amplifier units can be wired together and when used in conjunction with any type of tuner, make a very effective tuning set for either radiophone or code signals. Shipping weight, 3 pounds.



63 J 6352 \$9.75

Build Your Own Radio Receiving and Transmitting Set

WHILE we have endeavored to show in this catalogue many of the most popular types of receiving sets, there are, however, a great many of our customers who with very little study could build their own radio sets and we have, therefore, selected for them a complete line of parts for this purpose.

For a great many years even small boys have successfully built radio apparatus and have been able to receive and transmit over long distances with the apparatus they have made.

Radio is an extremely fascinating subject to study and the more you study it the more fascinating it will become. We suggest that you order a few of the simple books described on Page 33. A study of these books will show

you just how simple it is for you to build any part of a radio receiver or transmitter.

You will find in this catalogue a very complete list of parts which will enable you to build a set as low in price, or of as high a grade as you could possibly ask for. All these parts have been carefully selected by our own radio engineers, so that we know they are as near mechanically perfect as possible.

You will find from reading our radio books that you can start with a very inexpensive set and get satisfactory results. Additions can be made to your original outfit and you can add to it so that you can finally have an extremely sensitive, high power set that will amaze everyone when they consider that you have made it yourself.

Attach a MAGNAVOX Loud Speaker To Your Radio Receiving Set

Entertain your family and friends with radio concerts. Reproduce radiophone music, speeches, sermons, in any volume of sound you want and with a purity of tone that makes you think you are listening to the actual original instead of being miles away.

Simply substitute the Magnavox for the headset and an audience of one or a hundred may hear perfectly. The Magnavox equipment enables everything received by radio to be swelled to a volume of sound required for any occasion, without losing even the most delicate tone modulations or a single bit of the original clearness and distinctness. It makes a radio set practical for home entertainment, concerts and dances. In addition many business uses readily suggest themselves.

Easy to operate. Connections are simple and there are no adjustments to make. Best results are obtained with a set using one or two steps of amplification. No special circuits are required. Simply connect in place of phones and attach six-volt current on horn circuit. Plate voltages on amplifier can be from 50 up to 300 volts, and 90 volts has been found to be a good working voltage. The higher the voltage, the louder the sound. Horn diameter, 14 inches. Black enamel finish. Shipping weight, 17 pounds.



563 J 690 **\$45.00**



Westinghouse Vocarola

Usually several people want to listen in on the radio set at one time. This instrument makes it unnecessary to have a separate headset for each person, as it reproduces radiophone messages loud enough so that they usually can be distinctly heard for a distance of 15 or 20 feet or more. Consists of a metal amplifying horn to which is adapted a very sensitive loud reproducer. Produces pure, clear tones without metallic sound. Gives excellent results with any receiving set having one or two stages of amplification. Very compact. Furnished with six feet of cord and plug to connect to amplifier jacks. Can be laid on table or hung on wall. No battery currents of any kind required. Shipping weight, 3 pounds.



563 J 691 **\$30.00**

Rhamstine Adapt-O-Phone

This device may be used with your regular headset. Clamp both receivers to the base of the horn. The sounds from the two receivers enter the manifold and are amplified so that they emerge clear and loud from the horn. Gives very satisfactory results and a surprisingly large volume of sound. Satisfactory results can be obtained on either one or two stages of amplification. Height, 20 inches. Shipping weight, 4 pounds.

63 J 694 **\$12.00**



Vocarola Phonograph Attachment

Attachment

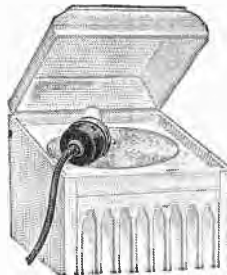
This is a loud toned reproducer fitted with an attachment that permits it being placed on a phonograph in place of the regular reproducer. The phonograph sound chamber is utilized as the amplifying horn. Connected with the first or second stage of amplification on any good receiving set, radio messages can be intensified to a volume of sound about equal to that ordinarily given off by a phonograph. Shipping weight, 1 pound.

63 J 6364—To fit **\$15.00**

Victrolas.....

63 J 6366—To fit **15.00**

Grafanolas.....



Firth Vocaloud

Radio stations equipped with a Vocaloud in conjunction with suitable receiving apparatus, will reproduce radio telegraph and radiophone signals capable of being heard in many cases as much as 100 feet away from the instrument. Best results are obtained when connected to sets having one or two stages of amplification. Consists of a Baldwin amplifying reproducer connected to a sound amplifying chamber of special design, which swells the sound to greatest volume without distortion. Produces rich, clear tones. Working parts are contained in a cabinet of solid mahogany with an extra high grade, polished finish. Shipping weight, 8 pounds.



563 J 692 **\$30.00**

Baldwin Loud Speaker Unit

This device consists of a Baldwin type C amplifying type of reproducer to which is fitted an adapter which may be inserted in the base of any sound amplifying chamber. With it you may make your own loud speaker; and with a properly designed sound chamber the results produced will be very satisfactory. This same unit constitutes the working part of many of the high grade loud speakers offered for sale today. Shipping weight, 1 pound.

63 J 6367 **\$6.00**



Arkay Loud Speaker Radio Horn

With this horn you can make your own loud speaker by simply inserting one of the phones from your headset in the base. It is so designed as to reproduce signals, speeches and broadcasting music without distortion, giving a pure and natural tone. Carefully constructed of brass throughout. Black enameled finish. Any make of radio receiver can be used. Best results are obtained with receivers of a Baldwin or Brandes type. Works best on two stages of amplification, although one stage often produces sounds of sufficient volume. Shipping weight, 4 pounds.

63 J 693 **\$5.00**



Federal Pleiophone Loud Speaker (Improved Model)

This is a complete loud speaking instrument and is offered at a very reasonable price. When used with two stages of amplification it will give sufficient signal intensity so that it may be distinctly heard for a distance of 15 feet or more. Consists of a special wound high resistance receiver mounted in the base, to which is connected a heavy amplifying horn. Finished in black enamel. Fitted with six feet of green silk connection cord. Base diameter, 5 inches. Height, 12 $\frac{1}{2}$ inches. Bowl diameter, 3 $\frac{3}{8}$ inches. Shipping weight, 4 pounds.

63 J 695 **\$14.00**



Our Special Head Phone Set

High Grade Supersensitive Radio Receivers



\$4.80

A Set
2000 Ohms

A high grade set of head phones offered at a very reasonable price. Are equal in sensitiveness and results to many phones selling at much higher prices. Light in weight and of substantial, durable construction. Every detail has been carefully worked out and only the best materials are used. The workmanship is the best, resulting in a neat appearing, finely finished article. Army-Navy style headband is properly shaped to give most comfort. Covered with heavy webbing. Adjustment to fit to head is quick, simple and secure. No chance to pull the hair. Black polished, molded receiver cases. Six-foot connecting cord with enclosed terminals. Equally suitable for use on the highest grade sets or the inexpensive crystal sets.

We guarantee these sets to satisfy you. If they do not, return them and we will gladly refund the purchase price together with transportation charges. Shipping weight, 1½ pounds.

63 J 5160—2000 ohms total resistance. Per set..... **\$4.80**
63 J 5161—3000 ohms total resistance. Per set..... **5.75**



Complete
\$7.60
2000 Ohms

Brandes Matched Tone Headsets

These receivers have established themselves as being the best at the price on the market and equal to many selling at higher prices. They are used throughout the world and are famous for their excellent workmanship, durability and extreme sensitiveness. The receivers of each set are very carefully selected, so that the tone values of the two receivers of each pair are exactly the same, resulting in the message being heard much more distinctly. Improved style,

comfortable, easily adjusted. Army-Navy headband covered with webbing. Will not catch the hair. Fitted with 6-foot polarity indicating connecting cord. Shipping weight, 1½ pounds.
63 J 5380—Superior type; total resistance, 2000 ohms. **\$7.60**
Net weight, 14 ounces.....



Complete
\$12.00
With 6-Ft.
Cord

Baldwin Amplifying Headsets

Type "C"

These are probably the most famous radio receivers. They are of an entirely different construction than any other on the market. They are fitted with special mica diaphragms which are actuated by a very thin, light armature which is super-sensitive to the slightest variation of current passing through the electro magnets. This special type of construction enables signals to be heard which are not audible in the ordinary headset. Their high efficiency has caused them to be used by the U. S. Bureau of Standards, by the U. S. Navy and War Department, by many foreign governments and by various private operators all over the world. The shell containing the mechanism is of molded bakelite. Comfortable web covered headband with firm, quick adjustment. Six-foot connecting cord fitted with universal plug to connect to any radio jack. Ship. weight, 2 pounds. **\$12.00**

63 J 5164.....

Receiver Cord



Made of heavy mercerized cotton, six feet long. For use with any standard double receiver. Shipping weight, 3 ounces. **70¢**

63 J 5385.....

Single Receiver Headset



A high grade single receiver mounted on a leather covered spring headband. Resistance, 1000 ohms. These receivers are especially designed for radio use and are just the thing where a low priced sensitive receiver is desired for use in connection with the inexpensive crystal detector receiving sets. Complete with connecting cord. Shipping weight, 1¼ pounds. **\$2.69**

63 J 5383.....

Western Electric Headsets

These receiver units are the most efficient commercial type on the market, being electrically the same as the Western Electric receivers recognized as standard both by the Army and Navy during the war. Their high efficiency is obtained by the scientific design of the structure and winding. The magnets are of high grade tungsten steel. The coils are wound with Western Electric black enameled copper wire, and the utmost care and precision in manufacture is observed. Case is of aluminum with molded bakelite earpiece.

The D. C. resistance of each unit is 1100 ohms.

The headband is covered with heavy textile webbing, and may be adjusted to any desired position.

The cord is high grade with black mercerized cotton covering, equipped with concealed tips on the receiver end and universal jack plug on the apparatus end. Shipping weight, 1½ pounds.



\$11.75
A Set

63 J 5379—Per set..... **\$11.75**

Brown Adjustable Phones

The Brown headset is known to be one of the most sensitive made. It is adjustable to any pitch or frequency by turning the adjustment screw on the back of the shell. This feature enables the operator to adjust both earpieces to the same tone, which results in the signals being more plainly heard. As it is desirable that the correct polarity may be maintained, the terminals of each earpiece and cord tips are marked. A very special feature of this set is the light weight, the weight of the complete head set without the cord being only nine ounces, which is several ounces lighter than any other make on the market. The lightness in weight, the correctly shaped earpieces and web covered headband make these the most comfortable phones and enable the operator to wear them for hours without fatigue. Shipping weight, 1½ pounds.

63 J 5166..... **\$18.00**



Complete
\$18.00

Receiving Condenser



Special type receiving condenser. The foil and insulation are wrapped around a fiber sheet. Connections are made by means of rivets in the ends of the condenser. Very compact. Equal in results to any other phone condenser. Capacity, .002 m.f.d. Ship. weight, 2 ounces. **29¢**

63 J 6351.....

Fixed Receiving Condensers



A necessity on any receiving set. Used as "stopping" condensers or for shunting across telephones. Molded composition bases. Nickel plated binding posts. Shipping weight, 8 ounces.

63 J 5362—Capacity, .01 m.f.d..... **88¢**
63 J 5364—Capacity, .005 m.f.d..... **68¢**

Detector and Amplifier Vacuum Tubes

Vacuum Tube Detector Radiotron U. V. 200



Detector tubes are replacing the old style of crystal detectors and enable reception of messages to which the crystal detector will not respond. This tube is made especially for amateur and experimental use. It incorporates all of the latest developments of vacuum tube manufacturing. Equally suitable for radiophone or code signals. These tubes are of the "soft" type and while especially designed as detectors, they will also give excellent results as audio frequency amplifiers. They are remarkably free from tube noises and "singing." Fitted with standard 4-prong mounting to fit any standard tube socket. Operates on a plate voltage of 10½ to 22½ volts, filament voltage 5 to 5½ volts. For best results we recommend that a tapped "B" battery be used in the plate circuit to enable a voltage potential best suited to the individual tube, to be applied to the plate. We also recommend that a potentiometer be used in the filament circuit as a micrometer adjustment of the filament circuit voltage is often necessary to give the best results.

63 J 5194—Shipping weight, 1 pound. Each.....\$5.00

A. P. Detector Tube (Electron Relay)



This detector tube has distinctive characteristics, because of which many persons prefer it. It is extremely critical in adjustment and therefore very sensitive to radiophone and telegraph signals when properly adjusted. "B" battery potential requirements vary from 18 to 20 volts, which means that a tapped "B" battery must be used. It has a copper grid and aluminum plate as in the old style tubular valve. Fitted with standard size 4-prong base. Shipping weight, 1 pound.

63 J 5196—Each.....\$5.00

Graphite Potentiometer



Used for regulating filament current of detector tubes. Resistance can be varied accurately and evenly. Nearly pure graphite, molded solid. Outside diameter, 2½ inches. Inside diameter, 2¼ inches. Cross section size, ¾ by ¾ inch. Resistance, 4000 ohms. Ends copper plated. Shipping weight, 3 ounces.

63 J 5620—Each.....69¢

Paragon Potentiometer



A potentiometer completely mounted and fitted with controlling lever and adjustment knob. Suitable for either panel or table mounting. Base diameter, 2½ inches. Base height, ¾ inch. Molded of condensite. Adjustable to panel of any thickness up to ¾ inch. Permits very close adjustment of plate circuit current. Resistance 300 ohms. Shipping weight, 8 ounces.

63 J 6368—Each.....\$1.65

Fixed Grid Condenser



The conductors are stamped from sheet copper and are insulated with paraffine paper. The entire unit is enclosed and impregnated and the terminals are spaced so as to mount at the back of the panel on the connecting posts of the grid leak listed below. Approximate capacity, .00025 mfd., which is the correct value for the new type detector tubes. Shipping weight, 2 ounces.

63 J 6369—Each.....32¢

63 J 5331—Each.....24¢ (Mica insulated grid condenser for use in grid circuit of vacuum tube. Approximate capacity, .00025 mfd. Not mounted. Shipping weight, 2 ounces)

Variable Grid Leak



A grid leak is necessary in the operation of vacuum tube detectors and some forms of amplifiers to permit the negative charge on the grid to discharge. A variable grid leak is most desirable. The base of this grid leak is moulded from bakelite and a pencil mark between the contact studs provides the variable resistance or leak. The metal cap is brass, finished in black. Two studs are provided with washers and nuts for panel mounting. Ship. weight, 3 ounces.

63 J 5341—Each.....55¢

Variable Grid Leak

A variable grid leak with six fixed values, varying in half megohm steps from ½ to 3 megohms. Resistance wire mounted on bakelite strip. Each step of resistance has a wire lead which can be attached to a switch point, thereby enabling the resistance to be conveniently varied by means of a switch lever. Shipping weight, 3 ounces.

63 J 6381—Each.....69¢

THE success of modern radio has been due to the development of vacuum tubes. Because of their great sensitiveness they make possible the reception of signals that could not otherwise be picked up.

The tubes listed on this page are two of the most popular on the market. They are scientifically constructed to meet the requirements of the most exacting purchaser. A detector tube and two amplifier tubes used in connection with the amplifying transformers listed on the opposite page will increase the volume of incoming signals to the greatest possible degree.

Vacuum Tube Amplifier Oscillator Radiotron U V 201

Amplifying tubes, working in conjunction with amplification transformers, are used to increase the audibility of signals passed through the detector tube. One, two or three tubes and transformers can be used in a group, although the most successful and the most satisfactory results are obtained when two are used. These tubes are of a high vacuum type and require no critical adjustment. They are very uniform and free from tube noises. Besides audio frequency amplification, these tubes can be used as detectors and radio frequency amplifiers. The normal plate voltage is approximately 40 volts, although increasing amplification can be obtained at plate voltages ranging up to 100 volts. Fitted with standard 4-prong base. Shipping weight, 1 pound.

63 J 5192—Each.....\$6.50



A. P. Amplifier Oscillator

This tube, working in conjunction with the A. P. Detector Tube and an amplification transformer with a ratio of 3 to 1, will produce superior results. It is of the high vacuum type and requires no critical adjustment. Very low ampere consumption on filament. Plate voltage can be varied from 40 to 100 volts. Works equally well as an audio or radio frequency amplifier and can also be used as a detector. Fitted with standard 4-prong base. Shipping weight, 1 pound.

63 J 5197—Each.....\$6.50



Receiving Grid Leak



Different detection and amplification circuits require grid leaks of different values. These cartridge forms of grid leaks are supplied in resistance to meet the requirements of all circuits ordinarily used. The resistance values are fixed and the ratings are accurate. Various resistances can be obtained by using two or three leaks wired in series or multiple. Shipping weight, 2 ounces.

63 J 6372—Grid leak resistance, 5 megohms.....75¢

63 J 6374—Resistance, 1 megohms.....75¢

63 J 6376—Resistance, 1.75 megohms.....75¢

63 J 6378—Resistance, 2.5 megohms.....75¢

Grid Leak Mountings

Consists of two spring clips with screw connections mounted on a bakelite base. Grid leak cartridges can be readily inserted or removed. Shipping weight, 3 ounces.

63 J 6370—Each.....48¢

Special Grid Condenser



A well-made, rugged condenser made of foil, insulated by paraffine paper and wrapped on a fiber base. Eyelets at each end of base for easy connection. Shipping weight, 2 ounces.

63 J 6382—Each.....29¢

Mounted Grid Leak Condenser

Pencil mark type grid leak condenser mounted between the two sheets of bakelite. Connections made through insulated binding posts. Can be fastened to panel or table. Shipping weight, 3 ounces.

63 J 6380—Each.....58¢

63 J 6386—Same style of grid leak as above but without binding posts. Each.....40¢





Panel Mounting Rheostat

Used to regulate filament current to detector or amplifier tubes. Smooth, even operation; no clicking. Neat appearing. Compact. Large attractive knob with pointer. Correct mechanical construction. Not affected by heat. Capacity, 1½ amperes. Resistance, 6 ohms. Mounts on panels up to ½ inch thick. Base diameter, 2½ inches. Screwwholes, 1 inch centers. Ship. weight, 6 ounces. **92¢**

63 J 6401



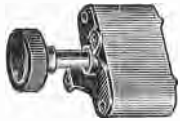
Positive Circuit Panel Mounting Rheostat

This rheostat insures a positive, even contact at all times. Circuit is through two resistance coils and sliding conductor bearing directly on the coils, not dependent on friction bearings. This style construction also permits of the most compact size, overall diameter being only 1½ inches. Bakelite base and knob. Resistance, 6 ohms. Capacity, 1½ amperes. Adjustable to panels up to ½ inch. Shipping weight, 6 ounces. **\$1.28**

63 J 6405

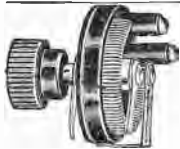
Graphite Disc Vernier Rheostat

Gives most even and finest control of filament current. Resistance is controlled by varying pressure on graphite disc, and screw adjustment permits milliamper current regulation. Very ruggedly constructed. Will handle detector, amplifier or 5-watt transmitter tubes. Resistance, 15 ohms. Capacity, 2½ amperes. Porcelain case encloses graphite disc. Shipping weight, 1 pound. **\$1.68**



63 J 6406

Klosner Vernier Rheostat Micrometer Adjustment



Permits vernier adjustment at any point equal to the finest potentiometer. With this rheostat better results are obtained using the critical tubes now on the market. Simple, quick, positive control of both main and vernier resistance; by only one knob. Resistance, 6 ohms. Capacity, 1½ amperes. Molded condensite base and knob. For panel mounting. Shipping weight, 4 ounces. **\$1.43**

63 J 6407

Jenkins Vernier Rheostat



A rheostat that permits of finest vernier control at any degree of resistance of a battery current. This is necessary for best results with the modern critical tubes. A special feature is the cutoff-switch arrangement which permits current to be cut on or off by a slight push in or out of the controlling knob, without disturbing the adjustment on the resistance sector. Compact, rugged, easily mounted. Fiber base. Molded bakelite knob. Resistance, 12 ohms. Capacity, 3 amperes. Shipping weight, 4 ounces. **\$1.88**

63 J 6409

Porcelain Base Rheostat



A rugged rheostat for experimental work. Glazed white porcelain base. German silver resistance wire wound on fiber strip embedded in base. Smooth easy action. Molded knob. Resistance, 11 ohms. Capacity, 3 amperes. Diameter, 4 inches. Shipping weight, 1½ pounds. **88¢**

63 J 5313

Molded V. T. Socket



Made of molded condensite. Takes all standard base tubes. Strong and durable. Positive contact. Marked connections. For base mounting only. Base size, 2¼ by 2¼ inches. Shipping weight, 4 ounces. **47¢**
63 J 6415
63 J 6416—Same style as above, molded of bakelite. **67¢**

Combination V. T. Socket



Can be mounted directly on panel or fastened to base. Durable, rugged construction. Positive contacts. Easy connections plainly marked. Molded condensite base. Shipping weight, 6 ounces. **\$1.19**

63 J 6417

Porcelain V. T. Socket



Made entirely of glazed white porcelain. High dielectric strength. So rugged as to be practically unbreakable. Positive contact. Easily mounted on panel or base. For amplifier, detector or power tubes. Shipping weight, 8 ounces. **57¢**

63 J 6419

Audio Frequency Amplifying Transformer-Radio Corporation Model 712

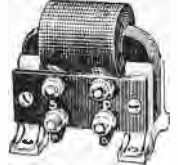


This transformer was designed especially to work with UV-200 and UV-201 tubes. Its characteristics are such that it gives the better amplification with less disturbance and losses are reduced to lowest possible minimum. Windings are encased within the laminated steel core. Ends are protected by stamped steel cover. Terminal posts are plainly marked. Net weight, 20½ ounces. Length, 3¼ inches. Height, 2¼ inches. Base, 2 by 2¼ inches. Winding ratio, 9 to 1. Shipping weight, 1½ pounds. **\$7.00**

63 J 6425

All American Amplifying Transformers

Designed with amplification and internal resistance constants to meet the requirements of Radiotron UV-201 and Cunningham C 301 tubes. Winding ratio of 10 to 1. Specially constructed to produce maximum amplification without distortion or howling. These transformers have given such good satisfaction that they are standard equipment with many manufacturers of the higher grade instruments. Shipping weight, 1 pound. **\$4.05**



63 J 6426—Mounted

63 J 6428—Unmounted

Same high grade transformer wound with 3 to 1 ratio, especially for use with A. P. Moorhead, Western Electric and similar tubes. Also desirable for 3rd and 4th stage of amplification when using Radiotron UV-201 or Cunningham 301. Shipping weight, 1 pound.

63 J 5140—Mounted

63 J 5141—Unmounted

Thordarson Amplifying Transformer

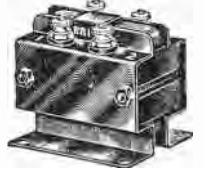
A transformer of special merit, employing unusual construction features that serve to produce superior results with any standard tubes. Windings are of large size silk covered wire, greatly reducing the possibility of burnouts. Proper impedance is secured by use of extra large core of shell type. Winding ratio is 3½ to 1. Primary and secondary are wound to give most efficient coupling, with low distributed capacity. Howling is practically eliminated. Fully mounted with binding post connections conveniently arranged. Shipping weight, 1 pound. **\$4.00**



63 J 6427

National Amplifying Transformer

Designed especially for use with Radiotron UV-201 and Cunningham C-301 tubes. Winding ratio, 9 to 1. This ratio has been found very satisfactory with these tubes. Shell type core gives maximum efficiency. Loss through leakage very low. Gives maximum amplification without howling. Enclosed in black enameled steel case with binding posts plainly marked. Low in price but will give results equal to many selling at higher prices. Shipping weight, 1 pound. **\$3.60**



63 J 6420—Mounted

63 J 6421—Unmounted

Federal Amplifying Transformer

The original amplification transformer. Its correct design and careful, perfect workmanship insures the best of results in any type of amplification circuit. It is especially compact. Winding ratio, 3 to 1. Audibility amplification is claimed to be 20 times on first step and 400 times on second step. Fully mounted. Shipping weight, 1 pound. **\$6.85**



63 J 6429

Radio Frequency Amplifying Transformer

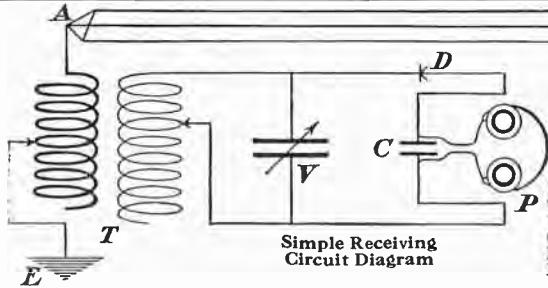
The development of Radio Frequency Amplification will be the next great step forward in the progress of radio. The transformer used will determine very largely the success obtained with most radio frequency hookups. The transformer we are here offering is the result of a long series of experiments combined with very careful, thorough engineering. It is of the all-core type, wound on a molded bakelite bobbin, the windings being in pancake style. This transformer will give very satisfactory results on a wavelength band from 180 to 500 meters. During tests conducted in Chicago using a hookup including one step of radio frequency amplification, a detector and two stages of audio frequency amplification, Amateur C. W. voice stations along the Atlantic coast have been heard with an ordinary one wire antenna. We do not claim such results are possible under all conditions, but merely cite this as an example of what has been done, using this transformer in circuit with other standard apparatus. Also very long ranges of reception are obtainable with indoor loop antennas. Windings enclosed in sealed case with convenient connections and with supports for mounting. Shipping weight, 1 pound. **\$4.40**

63 J 6639

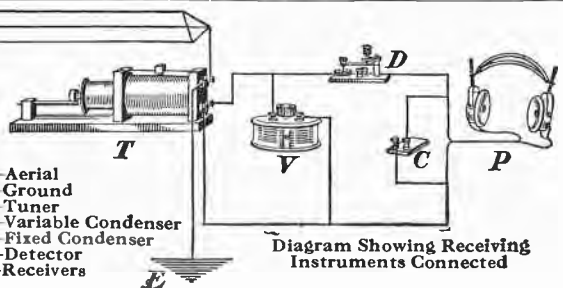
Coto Coil Radio Frequency Amplifying Transformer

Radio frequency amplification hookups are of two types—those using inductance transformers and those using amplifiers of the tapped impedance type. This instrument is of the latter type and produces some very wonderful results with the proper hookup. Remember that radio frequency amplification increases both the range and selectivity of a receiver. These units cover wavelengths from 180 to 750 meters. They can be mounted in tandem with a single control for all stages. Shipping weight, 10 ounces. **\$5.40**

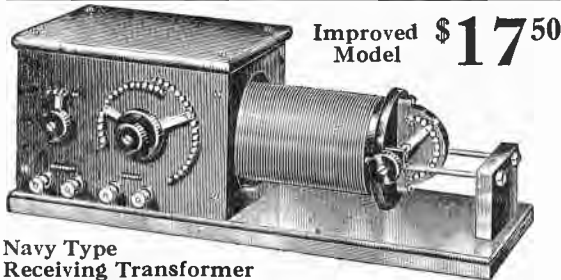
63 J 6637—Each



The above diagram shows a simple receiving circuit, using a loose coupler and detector. This circuit has been used for many years and produces very satisfactory results with the instruments shown on this page. Amateur stations, radio broadcasting, regular commercial messages, long distance commercial messages, time signals, etc., are all easily tuned in. The range of such a set is not as great as the range of an audion tube receiving set, nor are the signals as loud. It is impossible to state exactly how far such a set will receive, as the range will depend upon atmospheric conditions. However, many amateurs are daily copying stations a hundred miles distant and it is not unusual to copy code stations 400 or 500 miles away. Satisfactory results on radiophone broadcasting are limited to distances of 10 to 25 miles.



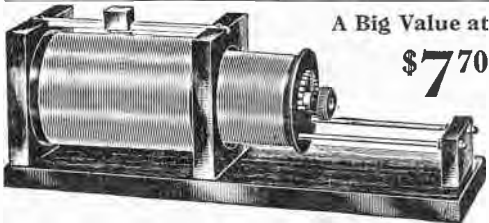
The above diagram is a graphic representation of the circuit shown in the diagram to the left and shows the instruments actually connected in the circuit. This circuit has been extensively tried out under varying conditions and has given good results. It must be understood, however, that there are many other ways of connecting up receiving instruments that give equally good results. The instruction books listed on the inside of the back cover give complete information covering various types of circuits and results to be obtained under varying conditions.



Navy Type Receiving Transformer

A very selective instrument for the more advanced stations. Primary inductance is controlled in steps by units and tens switches. Secondary has 12-point control. Perfect workmanship on switches and points makes a very smooth acting switch. Has wave range up to 4,000 meters and is very effective on short wave lengths, 200 to 600 meters. Formica panels. All connections plainly marked. Metal parts of brass, polished nickel finish. Single silk covered windings. Mahogany finished woodwork. Base is 18 inches long, 6 1/2 inches wide. Shipping weight, 25 pounds.

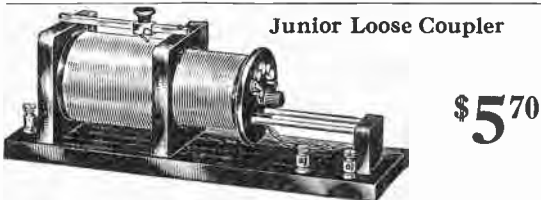
563 J 600 \$17.50



Improved Model Receiving Transformer

An efficient, high grade long wave tuner. Has same winding as our Navy type. Will receive all government time stations such as Arlington and Key West. Works up to 4,000 meters. Very effective on short waves, 200 to 600 meters. Primary controlled by slider. Secondary inductance varied by a 10-point switch mounted on formica panel, silk covered wire windings. Brass metal parts polished and lacquered. Mahogany finished woodwork. Base is 18 inches long, 6 inches wide. Shipping weight, 14 pounds.

563 J 601 \$7.70



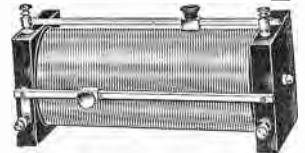
This coupler is specially designed to work on wavelengths from 180 to 800 meters. It is a very efficient tuner and can be used to receive either code or radiophone signals. Although low in price, it is of high grade construction and finish throughout. Rubbed mahogany finish woodwork. Brass parts polished and lacquered. Base size, 12 by 3 1/2 inches. Shipping weight, 6 pounds.

563 J 5103 \$5.70

Two-Slide Radio Tuning Coil

Machine spaced enameled copper wire windings on non-shrinkable tube. Windings cannot come loose. Control is by means of two smooth working sliders. Mahogany finished endpieces. Range up to 1,000 meters on average antenna. Length, 8 3/4 inches. Shipping weight, 4 pounds.

63 J 5104 \$3.25



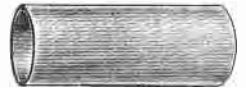
Cardboard Tubes

These tubes are used for making tuning coils, loading coils, etc. They are made of specially prepared wood pulp and are treated so that they will hold their shape permanently. Shipping weight, each, 1 pound.

63 J 6525—Size, 6 1/4 inches long, 3 1/2 inches outside diameter, 3 1/4 inches inside diameter. **18¢**

63 J 6526—Size, 7 1/4 inches long, 4 1/4 inches outside diameter, 4 1/4 inches inside diameter. **21¢**

63 J 6527—Size, 9 inches long, 3 1/2 inches outside diameter, 3 inches inside diameter. **23¢**



See Page 22 for Magnet Wire

Slider Rods

Used for building up tuning coils. Made of solid brass, smooth polished finish. Size, 1/8 by 1/8 by 8 3/4 inches long. The right length when using 63 J 6526 tube for the primary. Ship. wt., 6 oz.

63 J 6529 15¢



Loose Coupler Slide Contact

63 J 6532—Slider for 1/8-inch rod. Stiff spring insures positive contact when slide is moved either forward or back. Shipping weight, 3 ounces.

21¢



Weatherproof Detector

Very rugged. Perfect, easy adjustment. Phosphor bronze contact spring can be set and locked in any position. A piece of tested galena set in Wood's metal is mounted inside dust and moistureproof enclosed glass cylinder. All metal parts nickel plated and polished. A very attractive and efficient piece of apparatus. Formica base, 2 by 2 by 3/4 inches. Shipping weight, 1 pound.

63 J 5303 \$2.19



Wizard Detector Stand

This detector is a wonderful value for the money. Carefully made of highest grade materials. Uses any detector mineral. Adjustment can be made to any position. Sheet formica base, size 1 1/2 by 2 1/2 inches. Metal parts brass, nickel finish. Shipping weight, 4 ounces.

63 J 6535 89¢



Detector Crystals

Genuine Arlington Tested Minerals. Absolutely the best crystals that can be purchased at any price. All are thoroughly tested and guaranteed. Extremely sensitive. It will pay you to use only the best, first grade, tested crystals. Much of the success of your set depends upon the quality of the crystals. You will get good results with these. Packed separately in sealed boxes. Shipping weight, 3 ounces.

63 J 5320—Supersensitive Galena. Per crystal. **22¢**

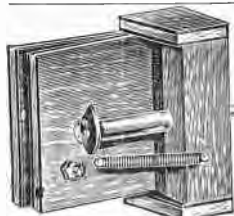
63 J 5322—Supersensitive Silcon. Per crystal. **22¢**

63 J 5324—"Radioctite." Per crystal. **18¢**



Variable Condensers

Variable condensers are very extensively used in different types of radio circuits. Every receiving station can make good use of one or two variable condensers, one of .0005 capacity and one of .001 capacity. Even with sets designed to be used without variable condensers better results are often obtained when one is placed in the antenna or closed circuit to balance the set.



Crosley Variable Condenser

This condenser works on an entirely new principle. Has two plates which are hinged and are opened and closed like a book by means of a special cam arrangement. The plates are surfaced with copper. One copper sheet is covered with mica, so that when the two plates are clamped tightly together, maximum capacity is obtained. Rated at .0005 mfd., but maximum capacity will average .0008. Excellent for receiving circuits and will withstand 1000 volts, making it usable for C.W. transmission. Especially adapted to panel mounting. Shipping weight, 1½ pounds.

63 J 6510

\$1.25

Murdock Variable Condensers

Murdock condensers have been on the market for many years. They have proven to be satisfactory on receiving circuits under many varying conditions. Both stationary and rotary plates are die-cast mounted, so that the spacing between the plates is absolutely uniform and accurate.



Enclosed Type

63 J 5175—Murdock No. 367. Polished black composition top and bottom plates with transparent enclosing cylinder, 22 stationary plates and 21 movable plates. Capacity, .001 mfd. Diameter, 3¾ inches. Length, 3¼ inches. Binding posts and pointer nickel plated; 180° engraved scale embedded into panel. Shipping weight, 2¼ pounds.

63 J 5177—Murdock No. 368. Same as above, except has 12 stationary plates and 11 rotary plates. Capacity, .0005 mfd. Shipping weight, 1½ pounds.

Panel Type

63 J 5179—Murdock No. 3681. Has 23 plates; .0005 mfd. capacity. Ruggedly assembled for panel mounting. Complete with mounting screws, knob, pointer, engraved 180° scale and anti-capacity handle. Has ¼ inch shaft.

Any standard knob or dial may be used. Requires space 3½ in. wide, 2 in. deep for mounting. Ship. wt., 1½ lbs.

63 J 5181—Murdock No. 3661. Same as above, except 43-plate size. Capacity, .001 mfd. Requires space 3¾ inches wide, 2¼ inches deep for mounting. Shipping weight, 2½ pounds.

Test Buzzers

Watch case buzzer. Operates on one dry cell. Nickel plated cover and base. One inch high; 2¼ inches diameter. Shipping weight, 8 ounces.

63 J 5345

85¢

Century Buzzer

Used by the Army and Navy and commercial wireless stations. For adjusting crystal detector. Operates on one or two dry cells. Base is hard rubber with black enameled brass cover. Two thumbscrews provide for adjustment of the armature to regulate the tone to desired pitch. Genuine Platinum contacts. Diameter of base, 2 inches. Ship. wt., 6 ounces.

63 J 5346

\$1.65

Test Buzzer Push-Button

For use with test buzzer. Nickel rim with pearl center. Held firmly in ½-inch hole by small spring clips. Shipping weight, 4 ounces.

63 J 5137

25¢

Standard Galena Detector Improved Model

A popular detector. Tested piece of galena is mounted in cup which can be rotated. Crystal contact of phosphor bronze wire coiled and pointed and soldered on flat spring. Very fine adjustment obtainable with screw. Molded base and adjustment knob. Base size, 3 by 3 inches. Shipping weight, 1¼ pounds.

63 J 5305

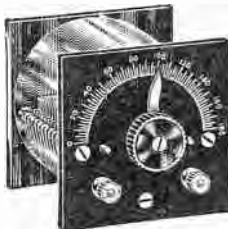
\$1.43



Variable Condenser

Table Mounting Type With Glass Case

A high grade variable condenser properly designed and very carefully made. Both stationary and rotary plates stamped from sheet aluminum. Accurately machined spacers insure perfect centering of plates. Square formica sheetens with engraved scale. Regulating dial and pointer. Glass case protects mechanism. Shipping weight, 3 pounds.



63 J 6480—21-plate size. Capacity, .0005 mfd. \$3.95
63 J 6481—43-plate size. Capacity, .001 mfd. 4.95

Variable Condenser

Panel Mounting Type

This is the same high grade condenser shown above. Can be mounted on any panel up to ¾ inch in thickness. Compact, easily mounted. Shipping weight, 2 pounds.



63 J 6484—11-plate size. Capacity, .00025 \$2.95
63 J 6485—21-plate size. Capacity, .0005 \$3.40
63 J 6486—43-plate size. Capacity, .001 \$4.20

Coto Variable Air Condenser

Panel Mounting Type

After looking over the market carefully, we do not hesitate in saying that these are the highest grade of condensers to be had today. Their mechanical construction is a step ahead of any other make, and the design and materials used are such that the greatest electrical efficiency is obtained. They are suitable for use in C.W. transmission circuits as well as for reception purposes. Mechanically durable. Solid case aluminum bearing support. Bearing wear automatically taken up. Will stay put in any position. As many plates can be removed as necessary if a smaller capacity condenser is desired. Positive electrical connections. Shipping weight, 2 pounds.



63 J 6489—15-plate size. Capacity, .0005 mfd. \$4.50
63 J 6490—23-plate size. Capacity, .0007 mfd. 5.00
63 J 6491—33-plate size. Capacity, .001 mfd. 6.00

Chelsea Variable Air Condensers

Mounted in Case

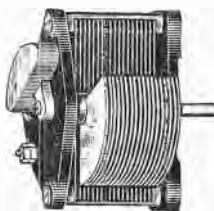
These variable air condensers are excellent examples of modern methods of mechanical and electrical construction. The two sets of plates, the stationary and movable, are each die-cast into one solid unit, which insures accurate spacing and alignment. The end plates are of genuine molded bakelite. Shaft is supported by two bronze bearings, insuring efficient operation even after long use. Large scale reading in hundredths. Has adjustable friction bearing, so that movable plates will remain in any position set. Ship. wts., 2 and 3 pounds.



63 J 6493—Capacity, .0006 mfd. \$4.50
63 J 6494—Capacity, .0011 mfd. 5.00

Chelsea Variable Air Condenser Panel Mounting Style

These variable air condensers embody the same high grade features as those listed above. They are suitable for mounting on any panel up to ¾ inch thick. They are fitted with a counterweight which is placed with the rotating shaft and exactly balances the rotating plates, so that the condenser will stay set at any point it is placed. Shipping weights, 2 and 3 pounds.



63 J 6497—Capacity, .0006 mfd. \$3.85
63 J 6498—Capacity, .0011 mfd. 4.35

Knocked Down Variable Condensers

A complete set of parts, furnished unassembled. Can be readily put together, and when assembled make a first class variable condenser. Intended for panel mounting. Complete with scale, pointer and knob. Formica tops and bases. Ship. wt., 1½ lbs.

63 J 5184—Capacity, .00025 mfd.; 11 plates \$1.95
63 J 5185—Capacity, .0005 mfd.; 21 plates 2.15
63 J 5183—Capacity, .001 mfd.; 41 plates 3.15

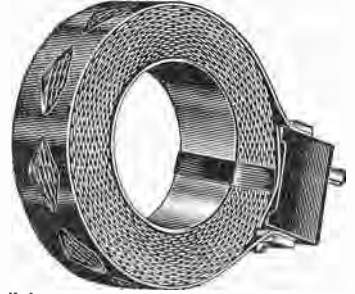


Honeycomb Inductance Coils

Honeycomb coils are used as receiving inductances, aeri- als, etc. Because of their compactness and wide range of adapt- ability and low price, every amateur should have a complete set. With them any style of straight, regenerative or radio frequency hookup may be made, and results obtained are superior because of the efficiency of the coils and the concentra- tion of the inductances.

These coils are compact, and permit of easy manipulation. They cover the entire range of wavelengths without the dead- coil losses that exist when a tapped coil is used, and have low high frequency resistance and distributed capacity losses.

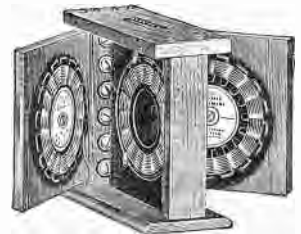
The construction of the coil is such that successive turns of conductor are wound at an angle to preceding turns and spaced therefrom, which gives the coil the cellular structure, from which it derives its name. These air cells and the angular disposition of the turns reduce the losses in the coil to a marked degree. With the proper condensers these coils will cover the entire range of wave- lengths used in radio. By use of the mounting plugs and brackets listed below, these coils can be very conveniently attached to a panel or other support. The panel brackets are of two types, the fixed and trunnion. The fixed is used where the coil is stationary, and the trunnion where it is desirable to rotate the coil for changing the degree of coupling, as between primary and secondary coils. Each coil, therefore, and its panel support is a separate unit which allows a great variety of arrangement to suit the ideas of the experimenter. For instance, the secondary induct- ure loaded by another coil to the proper value. The flexibility of these fixtures may be readily appreciated.



Characteristics and Prices, Honeycomb Wound Inductances

Unmounted Coils		Mounted Coils		Number Turns	Pure Inductance in MH.	Dis- trib. Capac- ity MM.F.	Natu- ral Wave Length Meters	Wave Length with .0001 Shunt Cap. Meters	Wave Length with .001 Shunt Cap. Meters
Article Number	Price Coils	Article Number	Price Each						
63 J 5470	39¢	63 J 5485	\$1.30	25	.03781	26.80	60.0	133	370
63 J 5471	42¢	63 J 5486	1.32	35	.07810	30.82	92.5	192	532
63 J 5472	49¢	63 J 5487	1.36	50	.1519	36.38	140.0	278	748
63 J 5473	55¢	63 J 5488	1.40	75	.3160	28.55	179.	386	1062
63 J 5474	59¢	63 J 5489	1.49	100	.5614	35.98	268.	527	1438
63 J 5475	62¢	63 J 5490	1.52	150	1.2915	21.18	312.	771	2160
63 J 5476	65¢	63 J 5491	1.58	200	2.219	18.80	385.	1004	2838
63 J 5483	68¢	63 J 5492	1.60	250	3.450	22.76	528.	1272	3570
63 J 5477	73¢	63 J 5493	1.70	300	6.792	18.72	672.	1739	5015
63 J 5478	78¢	63 J 5494	1.72	400	9.00	17.21	742.	1990	5720
63 J 5484	88¢	63 J 5495	1.85	500	14.45	17.20	940.	2515	7220
63 J 5479	98¢	63 J 5496	2.00	600	24.18	19.10	1280.	3300	9380
63 J 5469	\$1.20	63 J 5497	2.30	750	32.31	18.19	1445.	3805	10880
63 J 5480	1.38	63 J 5498	2.45	1000	60.50	16.65	1700.	5200	14600
63 J 5481	1.72	63 J 5499	2.80	1250	96.18	15.41	2295.	6590	18730
63 J 5482	2.17	63 J 5500	3.30	1500	143.00	15.70	2825.	8040	22860

Shipping weights, 6 ounces to 3 pounds each, according to size.



Turney Spider Web Inductances

A new form of inductance. May be used on wavelengths 180-400 meters. Adaptable to any style of hookup, straight detector—both crystal and audion—or regenerative. Special instructions accompany each set, and with the hookup given in instructions some remarkable results may be obtained. The three coils, one stationary, two movable, are mounted in wax finish golden oak cabinet. Close adjustment is attainable. Six binding posts mounted on formica strip for easy connection on any type circuit. Shipping weight, 2 pounds.

63 J 6550.....\$4.95



DeForest Geared Honeycomb Coil Mounting

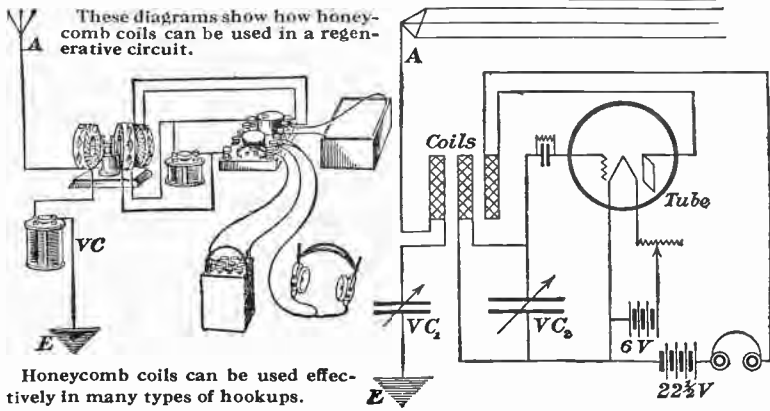
A three-coil mounting for either table or panel use. The center receptacle is fixed. The two outer receptacles are movable and may be rotated through ninety degrees by means of knobs geared to the mounting. The knobs are so located that they are readily accessible without bringing the hand close enough to the coils to produce capacity effects. Receptacles and binding posts are connected by heavy Litz wire. All metal parts nickel plated.

63 J 6540—Mounted on pedestal and base of oak. Shipping weight, 4 pounds. \$9.95

63 J 6541—Without base or pedestal. Shipping weight, 3 pounds. 6.20

Three-coil mounting without gears, consisting of brass anglepiece holding three receptacles which move on bearings so that coupling between the coils can be changed at will. Shipping weight, 1½ pounds.

63 J 6542.....\$3.65



Molded Bakelite Coil Plug

Used to mount any standard Honeycomb type coil. By using tape or other suitable material, which can be securely held to plug by the brass plates at top and bottom, coil may be mounted firmly in place. Shipping weight, 4 ounces.

63 J 6543—Each.....48¢

Fixed Panel Plug

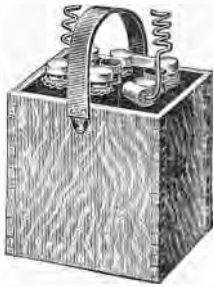
Fitted with brackets to mount on panel or other support. Made of molded bakelite. Takes any standard coil plug. Shipping weight, 4 ounces.

63 J 6545—Each.....55¢

Trunnion Panel Plug

May be swung to any position desired. Used in making two or three-coil mounting with variable coupling. Complete with anti-capacity handle. Shipping weight, 6 ounces.

63 J 6548.....\$1.18



Storage 'A' Battery
A battery specially designed for radio purposes. The plates are extra heavy and will enable the battery to hold its charge for a long period of time and to withstand sulphation when left in a partially discharged condition. The case is made of fine natural colored, varnish finished hard maple, with dove-tailed corners. Rubber covered wire terminal leads with brass wire connectors are provided, so that instrument connection wires will not be affected by acid fumes. Acid proof carrying handle makes it easy to move battery around. This is the most practical radio battery on the market, and is the best value yet offered.

563 J 492—6-volt 40-ampere size. Shipping weight, thirty pounds, **\$9.95**
563 J 494—6-volt 75-ampere size. Shipping weight, forty-two pounds. **13.25**

Vacuum Tube Plate Circuit Battery



The Audion 'B' Battery

Our "B" batteries are made of the finest materials by one of the best battery makers. We guarantee them to equal in results any battery on the market. Fresh stock at all times. Very uniform and have extra long shelf life.

63 J 5618 — 22½-volt battery. Signal corps standard size, 3¼ by 2 by 2½ inches. Ship- **\$.98**
2 pounds.

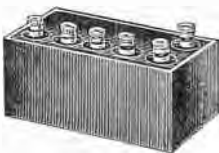
63 J 5621 — 22½-volt battery. Navy standard size, 6¼ by 4 by 3 inches. Shipping weight, 5 pounds. **1.73**

63 J 6451 — 45-volt battery. Double navy size, 6¼ by 6 by 3 inches. Shipping weight, 9 pounds. **3.40**

Tapped 'B' Batteries

63 J 6455 — 22½-volt. Navy size battery. Dimensions, 6¼ by 4 by 3 inches. Tapped to give 21, 19½, 18 and 16½ volts. Shipping weight, **\$1.80**
3 pounds.

63 J 6457 — 45-volt, double Navy size battery. Dimensions, 6¼ by 4 by 6 inches. Tapped to give 45, 22½, 21, 19½, 18 and 16½ volts. Shipping weight, 9 pounds. **\$3.60**
Each.



Hipwell 'B' Battery

Refillable variable "B" battery. Guaranteed to be noiseless. Because of its renewable, refillable feature, full service of the entire battery is assured. Can be tapped at any point, as each cell is fitted with an individual connection.

63 J 6459 — 22½-volt 15-cell small battery, size 2½ by 2¾ by 4¾ inches. Shipping weight, 2 pounds. **\$1.70**

63 J 6461 — 22½-volt 15-cell large battery, size 2½ by 4¼ by 7 inches. Shipping weight, 5 pounds. **\$2.45**



4½-Volt 'B' Battery Unit

These units may be used in making up "B" batteries. Five batteries connected making a standard 22½-volt battery, or four connected will produce eighteen volts, etc. Should it happen that one cell of the series goes dead, it is only necessary to renew the block in which it is located and you again have a perfect working set of batteries. Cells are same size as used in Navy type batteries.

Shipping weight, each, 1 pound. **38¢**
63 J 6463—Each.



1½-Volt Unit Cells

These units are size 1½ by 2¼ inches and can be used as renewals in any Navy size battery. They also fit the standard 1½-inch diameter flashlight cases. Shipping weight, each, 4 ounces. **39¢**
63 J 6465—3 for.



Standard Dry Cell

Highest quality standard size, 2½ by 6-inch dry cell. Initial test, 1½ volts, 25 to 30 amperes. Shipping weight, each, 3 pounds. **39¢**
63 J 2501—Each.



Unit Dry Cell Battery

Consists of four regular size, 2½ by 6-inch dry cells, connected together and sealed in an airtight container. This method of construction greatly prolongs the life of battery. Binding post connections, handle for carrying, can be used as an "A" battery. Tests 6 volts, 22 to 30 amperes. Size, 10¼ by 2¼ by 7 inches. Shipping weight, 10 pounds. **\$4.10**



463 J 418—Per set

Charge Your Own Storage Battery with this Battery Charging Rectifier

This rectifier, when connected with 110-volt 60-cycle alternating current, will supply a direct current for charging any type of storage battery. Just connect the attaching wire to any standard light socket and the rectifier charges the battery without further attention at a cost of only a few cents. Suitable for charging radio or auto storage batteries. No chance to get connections wrong as charger automatically seeks its own polarity. Only one moving part which, with ordinary use, will last for years and can be easily replaced if desired. Very compact. Size over all, 7 by 5¼ by 5¼ inches. Consists of a very efficient stepdown transformer mounted in steel frame. From transformer current passes through vibrating device which changes the alternating to direct current. Amperemeter registers charging rate. Prices include 10-foot connecting cord with socket plug, battery leads and two clips. Shipping weight, 10 pounds.

\$13.95



Charges Batteries For a Few Cents Each



563 J 6193—Charges 6-volt battery at 7 ampere rate. **\$13.95**
563 J 6191—Charges 12-volt battery at 5 ampere rate. **\$13.95**

4½-Volt 3-Cell Flashlight Battery

Standard flashlight battery, size 2¾ by 2¾ inches. Can be used to build up "B" batteries. By building up a standard radio "B" battery of these smaller batteries, a considerable saving is effected, because when one set of 3 cells burns out it can be readily replaced at a very small cost. Such a battery can also be tapped so as to give various voltages. Also fits standard size flashlight pocket cases. Shipping weight, for three, 1 lb. **81¢**
63 J 2236—3 for.



Standard Type Stepdown Transformer

Transforms 110-volt 60-cycle alternating current down to lower voltages. Windings sealed into steel cases. Connection post for obtaining different voltages. Fitted with 7 feet of cord and attaching plug.

63 J 1695 — 60-watt capacity produces from 2½ to 27½ volts in 2½-volt steps. Shipping weight, 4½ pounds. **\$2.75**

63 J 1697 — 100-watt capacity produces from 1½ to 24 volts in steps of 1½ volts each. Shipping weight, 10 pounds. **\$4.95**

63 J 1699 — 150-watt capacity produces 1½ to 30 volts in steps of 1½ volts each. Shipping weight, 13 pounds. **\$6.50**



Miniature Base Lamps

Light from batteries. Shipping weight of three, 2 ounces.

63 J 2307 — 3-volt. Lights on two dry cells. **42¢**
3 for.

63 J 2313—6-volt. Lights on four dry cells. Diameter, ¼ inch. Ship. weight, 2 ounces. 3 for. **42¢**



Porcelain Sockets for Miniature Base Lamps

Can be fastened to any support. Two screws for wire connections. Takes lamps listed above. Ship. wt. of three, 4 oz. **29¢**
63 J 2750—3 for.



Battery Connecting Clips

For connecting lead wires to storage battery terminals. Jaws open wide to attach to any size terminals. Made of steel, heavily lead coated. Perfect contact at all times. Length, 3¼ inches. Ship. weight of two, 8 oz. **35¢**
63 J 6197—2 for.



Connecting Clips

Spring clip for attaching connecting wires to binding post, etc. Insure a firm, perfect contact. Brass, polished nickel finish. Ship. wt. of three, 3 oz. **31¢**
63 J 6472—3 for.



Fahnstock Connectors

A very convenient device for connecting wires. Can be fastened to binding post or wire. Connecting wire instantly attached to make a perfect electrical and mechanical connection by simply pulling down spring clip. Takes any size wire used in radio instruments. Shipping weight, per dozen, 3 ounces. **25¢**
63 J 5607—Per dozen.



Electricians' Pliers



A high grade hardened steel Plier. Used a great deal on all electrical work. Handy around any workshop. Shipping weight, 6 ounces.

63 J 5802—6-Inch Sharp Nose Plier..... \$1.23



63 J 5808—Best hardened tool steel, diagonal jaw, Sidecutting Nipper. Length, 5 inches. Shipping weight, 4 ounces. Diagonal Jaw Pliers... **\$1.28**



Soldering Sets

63 J 5844—A complete outfit for doing ordinary small soldering. Consists of large soldering copper, bar of solder, powdered resin and directions.

In wooden box. Suitable for electrical work and light household repairing. Shipping weight, 1½ pounds. Set complete..... **\$1.55**

Electrical Soldering Irons

Do away with inconvenience of old type iron. Sew attachment plug into socket and turn on current. Iron heats to working temperature in two to three minutes. Copper soldering tips have special heat-retaining qualities. Tips screw into copper core. Easily removed and others substituted. Steel parts gunmetal finish. Equipped with 6-foot cord and attaching plug.



For Garage and General Heavy Work

63 J 5874—This set especially suitable for garage and general heavy work. Extra tips particularly adapted for soldering battery terminals and burning in connections. Length, 16 inches. Diameter of tip shown in iron, 1¼ inches; hooked tip average diameter, ½ inch; small tip diameter, ¼ inch. Shipping weight, 4 pounds. Complete with three tips, for use on 108 to 115-volt current..... **\$14.50**



For Use on 108 to 115-Volt City Current

63 J 5870—For general small soldering around the house or manufacturing plant. Length, 16 inches. Diameter of tip, 1 inch. Uses 200 watts current. Shipping weight, 3 pounds..... **\$10.95**

63 J 5872—For light soldering work for jewelers, telephone exchanges, etc. Especially suited to radio instrument construction and other uses. Length, 13¼ inches. Diameter of tip, ½ inch. Uses 75 watts current. Shipping weight, 2 pounds..... **\$8.75**

Wire Solder

63 J 5830—Resin core wire solder. Requires no flux. Indispensable for soldering electrical connections and extensively used on telephone and radio work. Ship. wt., 1½ lbs. Pound..... **70¢**

63 J 5832—Plain Wire Solder. Very handy for all electrical soldering. Pound..... **36¢**



Insulating Tape

For wrapping wires where insulation has been scraped off. In making joints on electric wires they must first be soldered then wrapped with rubber splicing compound over which friction tape must be wound.

63 J 5848—Black Friction Tape. ¾ inch wide. A high grade tape. Half-pound package. Shipping weight, 1 pound..... **25¢**

63 J 5854—Rubber Splicing Compound. ¾ inch wide. One of the best rubber splicing compounds on the market. Half-pound package. Shipping weight, 1 pound..... **30¢**

\$4.25



Gasoline Blow Torch

Tank of polished brass. Special bronze burner. Improved air pump. Produces solid blue flame generating about 1500 degrees (Fahrenheit). Easily regulated. Handy for electricians and linemen, plumbers or tinners. Has removable solder iron handle. Very handy around the radio room for soldering connections. Makes possible a positive permanent connection and insures against poor contact losses.

563 J 5864—One-pint size. Shipping weight, 3 pounds..... **\$4.25**

563 J 5866—One-quart size. Shipping weight, 4 pounds..... **\$4.90**



Radio Tap and Die Set

Standard sizes for radio instruments. Set includes one each, plug tap and round adjustable die of the following sizes: ⅜, ⅝, ⅞, 1, 1¼, 1½, 1¾, 2, together with a 5½-inch long choke to hold dies and a 5½-inch long tap wrench. Ship. wt., 2 lbs. **\$5.95**

84 J 7348—Set complete..... **\$5.95**

Magnet Wire

For building radio apparatus, repairing motors, other electrical apparatus, experimental work, etc. One piece only on a spool. Wire is standard B and S gauge. Insulation and wire both perfect and uniform. Supplied only in weight spools given.

Double Cotton Covered Magnet Wire Article Number **63 J 1350**

Enameled Magnet Wire Article Number **63 J 1400**

Price 8-Oz. Spool	Price 1-Lb. Spool	Gauge	Price 8-Oz. Spool	Price 1-Lb. Spool
\$.65	\$.95	14	\$.45	\$.85
.69	1.03	16	.46	.87
.74	1.12	18	.48	.92
.84	1.34	20	.62	.94
.92	1.54	22	.65	.98
1.02	1.74	24	.70	1.10
1.18	2.06	26	.76	1.20
1.46	2.62	28	.85	1.38
1.64	2.98	30	.88	1.42
1.95	3.58	32	.92	1.52
2.84	5.34	36	1.20	1.98

New Code Rubber Covered Wire, Single Braid



Solid conductor copper wire, insulated with rubber compound over which is one cotton saturated braid. Shipping weights, per 100 feet, 3 and 13 pounds. Sold only in lengths listed.

63 J 3015—Size 14. Price for 25 feet..... **\$.29**
 Price for 100 feet..... **95¢** Price for 500 feet..... **4.50**
63 J 3036—Size 4. Price for 10 feet..... **65¢**
 Per 25 feet..... **\$1.42** Per 100 feet..... **4.95**

New Code Twisted Pair Cotton Lamp Cord



Two conductor, twisted New Code Lamp Cord. Conductor consists of fine copper wire strands twisted together. Covering is of fine quality interwoven yellow and green cotton. Shipping weight, per 100 feet, 6 pounds. Sold only in lengths listed.

63 J 3175—Size 18. Price for 10 feet..... **\$.20**
 Per 25 feet..... **45¢** Per 100 feet..... **1.65**

Porcelain Tubes

Unglazed porcelain tubes, ⅝ inch inside, ¾ inch outside. Length given is from under head to end. Shipping weight, per dozen, 1 to 2 pounds.

63 J 3902—Length, 3 inches. Per dozen..... **20¢**
63 J 3906—Length, 6 inches. Per dozen..... **25¢**
63 J 3908—Length, 8 inches. Per dozen..... **62¢**



Glazed Porcelain Cleats

Take No. 10 or smaller wires. Have 2½-inch wire centers. Shipping weight, per dozen pair, 3 pounds.

63 J 3920—2 wire cleats. Per dozen..... **55¢**



Solid Porcelain Knobs

63 J 3927—New Code No. 5 ½ solid porcelain knob. Height, 1⅝ inches. Diameter, 1 ¼ inches. Hole, ¼ inch. Groove, ⅝ inch. Shipping weight, per dozen, 1 ½ pounds. Per dozen..... **28¢**

63 J 3929—No. 4 solid porcelain knob. Height, 1⅝ inches. Diameter, 1 ½ inches. Hole, ⅜ inch. Groove, ⅝ inch. Shipping weight, per dozen, 2 pounds. Per dozen..... **38¢**



Porcelain Entrance Switch

National Electric Code standard porcelain base entrance switch or main line cutout switch. Takes plug fuses. Capacity, 125 volts, 30 amperes.

63 J 4305—Two-pole switch. Shipping weight, 1 ½ pounds. Base size, 3¼ by 5¼ inches. Each..... **52¢**



Radio Screwdriver Set

This set of screwdrivers with blades ⅜, ½, ⅝ and ¾ inch wide will enable you to handle practically any radio instrument screw without marring it. Made of steel, nickel plated. Small drivers encased in large one. Length, 6 inches. Shipping weight, 6 ounces. **55¢**

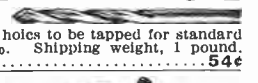
61 J 9760—Each..... **55¢**



Radio Drill Set

Set of six drills of proper sizes to drill holes to be tapped for standard radio screws, ⅜, ⅝, ⅞, 1, 1¼, 1½. Shipping weight, 1 pound.

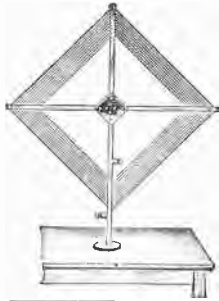
84 J 1053—Set of six..... **54¢**



Hand Drill

Goodell-Pratt hand drill, style 5¾. One of the finest produced. Best for radio instrument construction. Double gears, two speeds, three-jaw chuck. Capacity, 0 to ¾ inch. Polished wood handle with space for drills. No drills included. **\$4.10**





Indoor Loop Antenna

This loop was designed to meet the requirements of those persons desiring to receive radio messages without the use of an outside aerial wire. Some circuits and instruments using a loop antenna for the aerial will, under favorable conditions, receive stations several hundred miles distant. Specially adapted for receiving up to 600 meters wavelength. Very sharp tuning can be obtained by using a variable condenser in the circuit. Interference can be practically eliminated. Can also be used for direction finding. Comes knocked down complete with all necessary parts and wire. Directions for assembling and using included. Height, 44 inches. Shipping weight, 5 pounds.

563 J 651 **\$4.35**

Antenna and Copper Wire

Supplied only in size coils listed.

63 J 5150—Aerial cable. Composed of seven strands No. 22 B. & S. gauge harddrawn tinned copper wire. Shipping weight, per 100 feet, 6 pounds.
 50 feet, 49¢ 100 feet, 85¢ 500 feet, \$3.95
63 J 5151—Bare copper wire No. 14 gauge.
 50 feet, 22¢ 100 feet, 42¢ 500 feet, 1.70
63 J 5152—Bare copper wire No. 12 gauge.
 50 feet, 33¢ 100 feet, 62¢ 500 feet, 2.65

Copperweld Antenna Wire

The ideal wire for radio aeriels. Much stronger than ordinary copper wire. Made with a steel core onto which is welded an outer sheath of copper. Size No. 14. Shipping weight, 2 pounds.
63 J 5154—Per 100-foot coil..... **42¢**

Porcelain Base Knife Switches

Porcelain base switches. Contacts and blades made of heavy copper. Satisfactory for antenna switches, although we recommend the switches listed below. Can also be used on other parts of apparatus.

63 J 2684—Single pole single-throw switch. Base size, 1½ by 3¼ inches. Shipping weight, 6 ounces..... **22¢**
63 J 2686—Single pole, double-throw switch. Base size, 1½ by 3½ inches. Shipping weight, 10 ounces. Each..... **30¢**
63 J 2687—Double pole. Single-throw switch. Base size, 2 by 2½ inches. Shipping weight, 10 ounces..... **39¢**
63 J 2689—Double pole. Double-throw switch. Base size, 2½ by 4 inches. Shipping weight, 1 pound..... **48¢**



Ground Switches

A switch especially intended as an aerial grounding switch. Underwriters' Standard. 600 volt, 100 ampere. Single pole, double-throw. Mounted on an asbestos composition base which has high insulating properties. Shipping weight, 5 pounds.
63 J 5359..... **\$3.10**



Same type switch as above, except the separate parts are mounted on a high voltage insulation 3¼ inches high. Insulators fitted with screw washer at bottom so that switch may be mounted on any panel or base not over one inch thick. Shipping weight, 7 pounds.
63 J 6600..... **\$4.60**



Ground Switch Parts

Only a complete set of parts—contacts, switch lever and handle of the above 600-volt, 100-ampere switch. Can be mounted on base or panel. Shipping weight, 2 pounds.
63 J 6602..... **\$2.48**



Lightning Arrester

If you should neglect to throw your aerial switch to the ground contact when not using your instruments and an electrical storm should occur, serious injury might result to your apparatus. By installing one of these arresters in your antenna circuit above the ground switch, your instruments will be protected against possible injury. Mounted on a porcelain base. Shipping weight, 1½ pounds.
63 J 6608..... **72¢**



Antenna Wire Connector Block

If you have an antenna of more than one wire, you should connect the wires together with this connection block. Does away with soldering and loose connections. Made of solid brass. Easy to install. Ship. weight, 5 ounces.
63 J 6604..... **25¢**



Ground Rods

Iron ground rod. Length, 6 feet. Heavily galvanized. A ground rod is necessary with every radio outfit to insure a perfect ground contact from lightning switch. Shipping weight, 4 pounds.
63 J 1081..... **43¢**



Ground Clamp

If you ground your outfit on a waterpipe or steam-pipe, you should use a ground clamp to insure a perfect connection. Adjustable to any size pipe up to 1½ inches in diameter.
63 J 6606—Each..... **9¢**

Insulators

We are here introducing a new line of insulators for radio purposes which were produced after careful study and experiments. The material used is the most satisfactory, moderately priced material for the purpose and has rubber as a base. Tough and durable. No shellac is used. Has a high melting point (360° F.) and the dielectric strength is very high. Not affected by acids, water, or any ordinary atmospheric conditions. A particular feature of these insulators is that, with the exception of 63 J 6616 and 63 J 6618, there is no metal whatever used in their construction. This makes for greater strength and better resistance to the weather.

63 J 6610—Insulator for small aerial. Length over all, 4 inches. Flash over voltage, 35,000 volts. Ship. wt., 18¢ each, 4 ounces. Two for..... **36¢**

A popular style of round insulator with metal loops for holding wire.

63 J 6616—Length, 3 inches. Tensile strength, 250 pounds. Flash over voltage, 28,000 volts. Shipping weight, 4 ounces..... **17¢**
63 J 6618—Length over all, 3½ inches. Tensile strength, 350 pounds. Flash over voltage, 42,000 volts. Shipping weight, 4 ounces..... **20¢**

A rugged, solid type of insulator for longer aeriels.

63 J 6612—Length over all, 5½ inches. Tensile strength, 350 pounds. Flash over voltage, 40,000 volts. Shipping weight, 8 ounces..... **36¢**
63 J 6614—Length over all, 8½ inches. Tensile strength, 1,000 pounds. Flash over voltage, 90,000 volts. Shipping weight, 1¼ pounds. Each..... **66¢**



Air Gap Type Insulators

In this type insulator, air gaps have been interposed between live parts, thus imposing particular stress on the air and preventing any localized heating. This greatly builds up the electrical strength of the insulator and in thus preventing hot spots, eliminates possible mechanical failure.

63 J 6620—Length, 4 inches. Tensile strength, 750 pounds. Flash over voltage, 37,000 volts. Shipping weight, 1½ pounds..... **37¢**

63 J 6622—Length, 7¼ inches. Tensile strength, 1,200 pounds. Flash over voltage, 72,000 volts. Ship. wt., 2½ pounds..... **91¢**

63 J 6624—Length, 19 inches. Tensile strength, 1,200 pounds. Flash over voltage, 165,000 volts. The ideal type of insulator to use for transmitting aeriels and is a necessity for C.W. transmission. Shipping weight, 6 pounds..... **\$2.80**



Post Type Insulators

Used for supporting wires or other live conductors. Threaded inserts in top and bottom fitted with machine screws and washers. May be readily fastened to any panel base or instrument. Broad base insures a secure, stable mounting. Heights given are for insulators only and do not include screws.

63 J 6626—Height, 1½ inches. Diameter of base, 1½ inches; at top, 1 inch. Ship. wt., 8 ounces..... **48¢**

63 J 6628—Height, 3¼ inches. Diameter of base, 1¾ inches; at top, 1½ inches. Shipping weight, 1 pound..... **76¢**

63 J 6630—Height, 5¼ inches. Diameter of base, 2½ inches; at top, 1¾ inches. Shipping weight, 2¼ pounds..... **\$1.20**



Lead-in Bushings—Panel Insulators

63 J 6632—Especially designed for panel work. Length over all, 2½ inches; under shoulder, 1 inch; above shoulder, 1½ inches. Has ¼-inch hole through center from end to end. Shipping weight, 8 ounces..... **58¢**

63 J 6634—Length over all, 5¼ inches; under shoulder, 2 inches; above shoulder, 1¾ inches. Has rod through center projecting at ends. Threaded and fitted with nuts. Shipping weight, 1½ pounds. Each..... **90¢**

Window Sash Insulator. For bringing lead wires through window sash or wall. Length of insulation over all, 9 inches; under shoulder, 5½ inches; above shoulder, 3½ inches. Shipping weight, 3 pounds.
63 J 6636—With ¼-inch hole in center from end to end..... **\$1.35**
63 J 6638—With rod projecting from end to end and threaded projection ¼ inch long at each end, fitted with nuts..... **\$1.72**

Window Sash Insulator. For bringing lead wires through window sash or wall. Length of insulation over all, 9 inches; under shoulder, 5½ inches; above shoulder, 3½ inches. Shipping weight, 3 pounds.
63 J 6636—With ¼-inch hole in center from end to end..... **\$1.35**
63 J 6638—With rod projecting from end to end and threaded projection ¼ inch long at each end, fitted with nuts..... **\$1.72**

Wall Insulators

Specially designed as a lead-in insulator for outside walls. Can be adjusted to any size wall not over 5¼ inches thick. Length over all, 15½ inches; under shoulder, 10 inches; above shoulder, 5½ inches. Has ¼-inch hole in center from end to end. Ship. wt., 4 pounds.
63 J 6640..... **\$2.10**



Wall Insulators

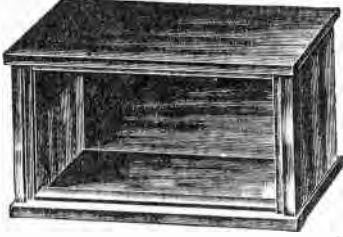
Especially designed as a lead-in insulator for bringing in wires from the outside. Can be adjusted to any wall not over 12 inches thick. Length over all, 22 inches; under shoulder, 16½ inches; above shoulder, 5½ inches. Has ¼-inch hole in center from end to end. Ship. wt., 6 lbs.
63 J 6642..... **\$3.40**

Electrose Insulators

These insulators have been used for radio purposes a good many years. They are molded of a shellac base composition which gives good service as an insulator. Have galvanized wrought iron eyes for attaching wires.



Article Number	Diam. In.	Length Over All, In.	Strength Lbs.	Elec. Value		Price Each
				Dry Volt	Rain	
63 J 5630	2¼	3¼	250	40,000	25,000	28¢
63 J 5631	1½	4	1,000	40,000	15,000	35¢
63 J 5632	1½	10½	1,000	90,000	50,000	61¢



Wood Cabinets

The tendency in the radio field today is to put apparatus in cabinets—not only for appearance, but as a protection against dirt and atmospheric conditions. The cabinets we offer are attractive in design and are of uniform style so that you can use cabinets of different sizes and have them all match up. Panels are rabbeted into the front. Lids or tops are hinged. The wood used is kiln-dried gumwood in fine dull antique mahogany finish. Dimensions given for height, width and depth are inside measurements and are in inches.

Article Number	For Panel Size	Shp. Wt. Pounds	High	Wide	Deep	Price
63 J 6655	6x7	5 1/4	5 1/2	6 1/2	7	\$2.40
63 J 6656	6x10 1/2	6	5 1/2	10 1/2	7	2.69
63 J 6657	6x14	7	5 1/2	13 1/2	7	3.18
63 J 6658	6x21	12	5 1/2	20 1/2	7	3.80
63 J 6659	7x9	6	6 1/2	8 1/2	7	2.90
63 J 6660	7x18	11 1/4	6 1/2	17 1/2	7	3.90
63 J 6661	9x14	10	8 1/2	13 1/2	10	3.58
63 J 6662	12x14	11	11 1/2	13 1/2	10	4.25
63 J 6663	12x21	13	11 1/2	20 1/2	10	4.97
63 J 6664	14x18	13	13 1/2	17 1/2	10	5.10

Radio Panels

We supply Formica, Bakelite or Condensite celeron, whichever we have in stock.

These panels are standard for mounting radio instruments in a cabinet. They have a high dielectric strength and a mechanical strength far greater than will ever be needed. Machine easily and will not warp nor absorb moisture. Supplied in handsome natural glossy black finish, which may be sandpapered and oil rubbed to produce a velvet satin finish. Sizes given are in inches. Shipping weights, 2 to 8 pounds.

Size	1/2-Inch Thick		3/8-Inch Thick		1/4-Inch Thick	
	Article Number	Price	Article Number	Price	Article Number	Price
6x7	63 J 6670	\$ 5.50	63 J 6680	\$ 7.75	63 J 6690	\$1.00
6x10 1/2	63 J 6671	.75	63 J 6681	1.13	63 J 6691	1.50
6x14	63 J 6672	1.00	63 J 6682	1.50	63 J 6692	2.00
6x21	63 J 6673	1.50	63 J 6683	2.25	63 J 6693	3.00
7x9	63 J 6674	.75	63 J 6684	1.13	63 J 6694	1.50
7x18	63 J 6675	1.50	63 J 6685	2.25	63 J 6695	3.00
9x14	63 J 6676	1.50	63 J 6686	2.25	63 J 6696	3.00
12x14	63 J 6677	2.00	63 J 6687	3.00	63 J 6697	4.00
12x21	63 J 6678	3.00	63 J 6688	4.50	63 J 6698	6.00
14x18	63 J 6679	3.00	63 J 6689	4.50	63 J 6699	6.00

Panels

A new style of panel for radio work. Made of rubber base compound. Very attractive glossy dark brown finish. Will retain its rich color indefinitely. Has higher dielectric strength than ever needed for panel work; strong, practically unbreakable. Drills nicely. Moistureproof. Thickness, 3/8 inch

Article Number	Size, Inches	Shipping Weight	Price, Each
63 J 6710	6x7	2 pounds	\$.53
63 J 6711	6x10 1/2	3 pounds	1.79
63 J 6712	6x14	3 1/2 pounds	1.95
63 J 6713	6x21	4 pounds	1.95
63 J 6714	7x9	3 pounds	1.56
63 J 6715	7x18	4 pounds	1.56
63 J 6716	9x14	4 pounds	2.07
63 J 6717	12x14	5 pounds	2.07
63 J 6718	12x21	6 pounds	2.07
63 J 6719	14x18	6 pounds	2.07

New Style Dial and Knobs

These dials and knobs are molded in one piece. They have a glossy black finish and are the most attractive looking on the market. Beveled edges. Finely engraved scale and figures filled in with contrasting brilliant white enamel, which stand out sharply and are easily read. The large and small dials match and combine well on a set. Shipping weights, 6 and 8 ounces.



- 2 1/2-inch Diameter Dial and Knob. 180 degree scale marked 0 to 100. 95¢
- 63 J 6721—To take 1/4-inch shaft. 95¢
- 63 J 6722—To take 3/8-inch shaft. 95¢
- 63 J 6723—To take 1/2-inch threaded shaft. 95¢

- 90 degree scale marked 0 to 100. 95¢
- 63 J 6725—To take 1/4-inch shaft. 95¢
- 63 J 6726—To take 3/8-inch shaft. 95¢
- 63 J 6727—To take 1/2-inch threaded shaft. 95¢
- 3 1/2-inch Diameter Dial and Knob. 180 degree scale marked 0 to 100. \$1.48
- 63 J 6731—To take 1/4-inch shaft. \$1.48
- 63 J 6732—To take 3/8-inch shaft. \$1.48
- 63 J 6733—To take 1/2-inch threaded shaft. \$1.48

Molded Dial and Knob. Made of molded condensite. Beveled edges, radial lines and figures are engraved in and filled in with contrasting brilliant white enamel. Dial diameter, 3 inches. Shipping weight, 3 ounces. 63 J 6655—Dial only. 39¢ 63 J 6656—Knob only. 20¢



Hard Rubber Dial and Knob. Molded in one piece of polished black hard rubber. Finely engraved 180° scale in contrasting white enamel. Shipping weights, 5 and 7 ounces. 63 J 6740—3-inch diam. for 1/4-in. shaft. Each. 59¢ 63 J 6741—3-inch diam. for 3/8-in. shaft. Each. 59¢ 63 J 6742—4-inch diam. for 1/4-in. shaft. Each. 80¢ 63 J 6743—4-inch diam. for 3/8-in. shaft. Each. 80¢



Marconi Knobs

A knob suitable for large panels. Two sizes, match perfectly. Polished black finish. Has 3/16-inch hole at bottom tapering to 7/16-inch at top. Shipping weights, each, 3 and 4 ounces; per dozen, 1 1/2 pounds. 63 J 5665—Diameter, 1 1/4 inches. \$1.00 Each. 10¢ Dozen. 63 J 5667—Diameter, 2 1/8 inches. Each. 2 1/4 Dozen. 2.40



New Government Style Knobs

Very neat appearing. Just the kind for highest class apparatus. Polished black finish. Brass threaded bushings 1/2 or 1/4 insert in knob. Shipping weight, each, 3 ounces; per dozen, 1 pound. 63 J 5701—Diameter, 1 inch. 1/2 bushing. 98¢ Each. 10¢ Dozen. 63 J 5702—Diameter, 1 1/8 inches. 1/2 bushing. Each. 12¢ Dozen. \$1.35 63 J 5669—Diameter, 1 inch. 3/8 bushing. 10¢ Dozen. 98 63 J 5671—Diameter, 1 1/8 inches. 1/2 bushing. Each. 12¢ Dozen. 1.35



New Government Style Knobs With Hole for Shaft

Same style as above knobs. Look very attractive even on highest class apparatus. Polished black finish; 3/8-inch shaft hole. Top is countersunk for nut. Two holes in bottom for stay pins. Shp. wt. each, 3 oz.; dozen, 1 lb. 4. 63 J 5704—Diameter, 1 inch. Each. 10¢ Dozen. 98¢ 63 J 5705—Diameter, 1 1/8 inches. Each. 12¢ Dozen. \$1.35



Standard knob. Polished black finish with fluted edges. Neat and attractive. Fitted with metal bushing tapped for 3/8-inch rod with set screw. Diameter, 1 1/4 inches. Shipping weight, each, 3 ounces; dozen, 1 1/4 pounds. 63 J 5675—Each. \$.20 Dozen. 2.25 Regulation style knob with fluted edges. Polished black finish. Diameter, 1 1/2 inches. Fitted with 3/8 bushing. Shipping weight, each, 3 ounces; dozen, 1 pound. 63 J 5673—Each. 10¢ Dozen. 98¢



New Style Radio Knob

A new pattern knob with deeply indented fluted edges, giving a good finger hold. Two sizes to match each other. Will add to the appearance of any panel; 1/2-inch hole through center. Countersunk at front. Shipping weight, each, 3 ounces; dozen, 1 pound. 63 J 5706—Diameter, 1 inch. Each. \$.14 Dozen. 1.60 63 J 5707—Diameter, 1 1/4 inches. Each. 2.30 Dozen.



Same style as above but with knurled edges. Two sizes to match each other. Will add to the appearance of any panel; 1/2-inch hole through center. Countersunk at front. Shipping weight, each, 3 ounces; dozen, 1 pound. 63 J 5709—Diameter, 1 inch. Each. \$.14 Dozen. 1.60 63 J 5711—Diameter, 1 1/4 inches. Each. 2.30 Dozen.



A knob used extensively on small panels, small pieces of apparatus, etc. Has 3/32 brass bushing. Diameter, 1 inch. Knurled edges. Polished black finish. Shipping weight, each, 3 ounces; dozen, 1 pound. 63 J 5713—Each. 11¢ Dozen. \$1.10



A series of knobs matching each other, which may be used for various purposes such as binding posts, tops of detectors, tuning coil sliders, etc. Polished black finish. Shipping weight, each, 3 ounces; dozen, 1 pound. 63 J 5715—Diameter, 1 1/2-inch; fitted with 1/2 bushing. Each. 32¢ Dozen. 63 J 5716—Diameter, 1 1/2-inch; fitted with 3/8 bushing. Each. 4¢ Dozen. 35¢ 63 J 5717—Diameter, 1 1/8-inch; fitted with 1/2 bushing. Each. 5¢ Dozen. 47¢



Series Parallel Switch

A useful article for any radio station. Permits changing over from one circuit to another. Is attractive appearing. Diameter, 1 1/2 inches. Polished black finish. Switch blades made of phosphor bronze; spring polished nickel finish. Radius of blades, 1 1/2 inches. Blades make wiping contact. Panel bushing adjustable to any thickness up to 3/8 inch. Collar adjustment insures good contact and a smooth working switch. Shipping weight, 4 ounces. 63 J 6770. 69¢



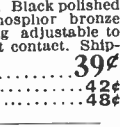
Inductance Switch

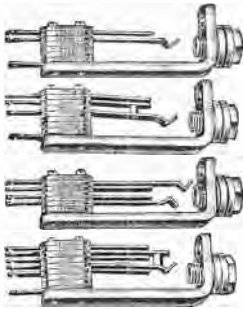
Made to match the above series parallel switch. Attractive appearing knob. Diameter, 1 1/2 inches. Phosphor bronze contact spring, polished nickel finish. Radius, 1 1/2 inches. Panel bushing adjustable to any thickness up to 3/8 inch. Adjustment collar insures good contact and a smooth working switch. Shp. wt., 3 ounces. 63 J 6771. 47¢



Our Special Inductance Switch

High grade smooth working switch. Black polished composition knobs, nickel finished phosphor bronze spring and bushings. Panel bushing adjustable to any thickness up to 3/8 inch. Perfect contact. Shipping weight, each, 3 ounces. 63 J 6773—Radius, 1 inch. 39¢ 63 J 6774—Radius, 1 1/2 inches. 42¢ 63 J 6775—Radius, 1 1/2 inches. 48¢





Radio Jacks

Especially designed for radio work. Very compact, carefully constructed, finely finished. May be mounted on panels up to 1/2 inch in thickness. Contact points are silver. Nickel plated polished frame. Shipping weight, each, 3 ounces.

- 63 J 6780—Open circuit... 62¢
- 63 J 6781—Closed circuit... 72¢
- 63 J 6782—2 circuit. Each... 80¢
- 63 J 6783—3 Spring. Filament control. Each... 94¢
- 63 J 6784—5 spring. Filament control. Each... \$1.19

Radio Plugs



63 J 6785—Especially designed for use in connection with above jacks. Large spaces for attaching cord. No soldering. Length, 2 1/2 in. Ship. wt., 3 oz. Each... 97¢



Universal Radio Plug
Fits any standard jack. Cords easy to connect. Ship. weight, 3 ounces. \$1.10
63 J 6790—Each

Patent Twin Adapter

63 J 6791—Same style as Universal Radio Plug, except will take two sets of phone cords. Each... \$1.35

Firth Radio Plug



63 J 6792—An excellent plug of patented design. Connecting cord can be fastened without use of screwdriver. Attractive looking round body. Ship. wt., 3 ounces. Each... \$2.38

Patent Multijack



63 J 6794—This simple device enables you to connect up three headset sets with any receiving set, or two sets of phones and a loud speaker. Can be fastened in any convenient place. All standard plugs will fit it. Shipping weight, 4 ounces. Each... \$1.42

Anti-Capacity Switch



63 J 6796—Double throw, double pole 12-spring standard switch key; 1 1/2 inches wide; 3/4 inch deep. Overall length, 3 3/4 inches. Arranged to mount on inside of panel. Only the switch lever appears on the outside of the plate. Shipping weight, 8 ounces. Each... \$2.58

Machine Screws

Made of brass with slotted head, accurately cut threads. Sold only in even units of quantities listed. Ship. wt., per dozen, 2 ounces; per gross, one pound.

Lgth. In.	Size #52			Size #62			Size #92		
	Article Number	Per Doz.	Per Gr.	Article Number	Per Doz.	Per Gr.	Article Number	Per Doz.	Per Gr.
3/8	63J6841	12¢	96	63J6846	12¢	96	63J6851	12¢	96
1/2	63J6842	12¢	96	63J6847	12¢	96	63J6852	12¢	96
5/8	63J6843	12¢	96	63J6848	12¢	96	63J6853	12¢	96
3/4	63J6844	16¢	1.25	63J6849	16¢	1.25	63J6854	16¢	1.25
1	63J6845	16¢	1.25	63J6850	16¢	1.25	63J6855	16¢	1.25

Brass Nuts for Machine Screws

Nuts to fit above machine screws. Sold only in quantities listed. Ship. wt., per doz., 2 oz.; per gross, 8 oz.

- 63 J 6860—Size #52. 3 dozen for 20¢ Per gross... 60¢
- 63 J 6861—Size #62. 3 dozen for 24¢ Per gross... 72¢
- 63 J 6862—Size #92. 3 dozen for 28¢ Per gross... 80¢

Brass Washers for Above Machine Screws

Washers have whole sizes to fit machine screws of sizes given. Ship. wt., per doz., 2 oz.; per gross, 8 oz.

- 63 J 6865—Size, #52. 3 dozen for 18¢ Per gross... 48¢
- 63 J 6866—Size, #62. 3 dozen for 20¢ Per gross... 54¢
- 63 J 6867—Size, #92. 3 dozen for 22¢ Per gross... 60¢

Tinned Copper Wire

Specially harddrawn tinned copper wire, intended for connections in apparatus. Its stiffness permits of making a neat, efficient job. Supplied in 24-inch lengths only. Ship. weight for 3 pieces, 8 oz.

- 63 J 6901—Size 12 square. 3 pieces for... 15¢
- 63 J 6902—Size 12 round. 3 pieces for... 12¢
- 63 J 6903—Size 14 round. 3 pieces for... 14¢

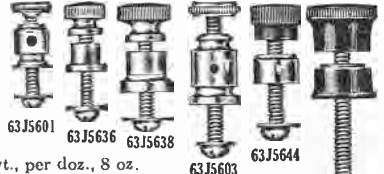


Switch Points—Made of brass nickel plated. All have 5/8-inch screws or shanks threaded #52. Shipping weight, per dozen, 4 ounces.

- 63 J 5646—1/4 by 1/4 head with machine screw and soldering lug. Per dozen... 33¢
- 63 J 5650—1/4 by 1/4 head. Fitted with two nuts. Per dozen... 38¢
- 63 J 5648—Head 1/4-inch diameter, 1/4-inch high. Fitted with two nuts. Per dozen... 35¢
- 63 J 5647—3/8 by 3/8 head. Fitted with copper lug. Per dozen... 33¢

Binding Posts

Metal parts of brass, polished nickel finish. All have 5/8-inch long #52 screws with washers. Sizes given are from bottom of shoulder to top of knob and do not include screw. Ship. wt., per doz., 8 oz.



- 63 J 5636—Length, 3/8 inch. Each, 7¢. Doz... 69¢
- 63 J 5638—Length, 1/2 inch. Each, 9¢. Doz... 98¢
- 63 J 5601—Length, 1 1/8 inch. Each, 7¢. Dozen... 69¢
- 63 J 5603—Length, 1 1/2 inch. Each, 9¢. Dozen... 98¢
- 63 J 5644—Length, 1 1/2 inch. With black molded knob. Each, 9¢. Dozen... 98¢
- 63 J 5605—A large size black molded knob and base. Base moulded onto one inch long #52 screw. Length of base and knob, 1 1/2 inches. Each, 17¢. Dozen... \$1.95

Threaded Brass Rod

Supplied in 8-inch lengths. Clean, accurate threads. Sold only in length quoted. Shipping weight for 3 lengths, 8 ounces.

- 63 J 6875—Size #52. 3 for... 22¢
- 63 J 6876—Size #62. 3 for... 28¢
- 63 J 6877—Size #92. 3 for... 35¢

Solid Brass Rod

For shafts, etc. Supplied only in 8-inch lengths. Shipping weight for 3 lengths, 8 ounces.

- 63 J 6880—Size 6. 3 lengths for... 18¢
- 63 J 6881—Size 8. 3 lengths for... 24¢
- 63 J 6882—Size 10. 3 lengths for... 29¢
- 63 J 6883—1/2 inch. 3 lengths for... 35¢
- 63 J 6884—5/8 inch. 3 lengths for... 45¢

Copper Lugs

Fit onto machine screws. Intended to be clamped and soldered to connecting wire. Shipping weight, per dozen, 2 ounces; per gross, 6 ounces.

- 63 J 6892—To fit #52 screw. Per doz., 11¢. Per gross... 58¢
- 63 J 6893—To fit #62 screw. Per doz., 12¢. Per gross... 59¢
- 63 J 6894—To fit #92 screw. Per doz., 13¢. Per gross... 60¢

Switch Stop—63 J 5609—Made of brass, polished nickel finish. Will fit any panel up to 3/8 inch thick. Supplied with one lock nut. Shipping weight, 4 ounces. 4 for... 18¢



New Style Binding Post

A specially constructed binding post. Has a non-removable knurled knob. May be mounted onto any panel up to 3/8-inch thick. Made of brass polished nickel finish. Fitted with copper lug and locknut. Shipping weight, 8 ounces.

63 J 5610—Each... 12¢ Dozen... \$1.20

Sheet Mica—86 J 2569—Used as dielectric for condensers. Clear firm sheets. Shipping weight, per dozen, 3 to 8 ounces.

- Size, 2 by 3 inches. Per dozen sheets... 21¢
- Size, 2 1/2 by 4 inches. Per dozen sheets... 53¢
- Size, 3 by 5 inches. Per dozen sheets... 93¢
- Size, 5 by 7 inches. Per dozen sheets... \$2.98

Varnish Cambric Tubing "Spaghetti"

Perfectly shaped tubing of high dielectric strength. Used to cover connecting wires in instruments. Insures proper insulation. Supplied in 4-foot lengths only. Color, yellow. Ship. wt., for 4 feet, 4 ounces.

- 63 J 6896—Size 3, takes size 12 wire and smaller. 4 feet for... 32¢
- 63 J 6897—Size 2, takes size 17 wire and smaller. 4 feet for... 32¢
- 63 J 6898—Size 1, takes size 25 wire and smaller. 4 feet for... 32¢

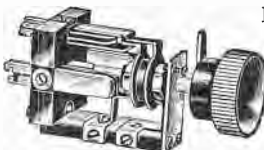
Iron Setscrews

Iron setscrews, #52 size. Shipping weight, per dozen, 2 ounces.

- 63 J 6887—1/4 inch long. Per dozen... 10¢
- 63 J 6888—3/8 inch long. Per dozen... 11¢
- 63 J 6889—1/2 inch long. Per dozen... 12¢
- 63 J 6890—1 inch long. Per dozen... 13¢

Tinfoil

63 J 5680—Used for making condensers. In sheets size, 6 1/2 by 8 1/2 inches. Approximately, 25 sheets to the pound. Per pound... 29¢



Radio Automatic Filament Control Switch for Detector, 2 Stage Amplifier

Takes the place of three filament control jacks and plugs. Phones or loud speaker hooked up to switch can be instantly put in circuit with either detector, first or second stage of amplification. Turns off filament current on tubes not being used. Easily mounted on panel. Furnished with knob and pointer, directions and blueprint of connections. A substantially made high grade article. Shipping weight, 1 1/2 pounds. \$5.90
63 J 6798—Each

Spark Transmission Apparatus



Wireless Spark Coils

These coils are carefully constructed and operate successfully on either dry cells or storage batteries. The vibrator is of excellent construction and gives a pure, even tone. The necessary primary condenser is enclosed in the base and is of correct size for proper operation. Properly adjusted, the half-inch coil has a sending range of from 2 to 5 miles, the one-inch coil 5 to 10 miles. Amateurs will appreciate the efficiency of this moderately priced spark coil. Shipping weights, 6 and 8 pounds.

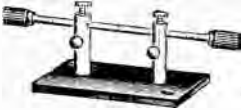
- 63 J 5126—Half-inch coil..... \$4.85
63 J 5127—One-inch coil..... 6.95



Spark Coil Transmitting Condenser

Designed for use with spark coil sets, dielectric of five 5 by 7 photo plates. Mahogany finished case. Permits working on 200 meter wave. Shipping weight, 3 pounds.

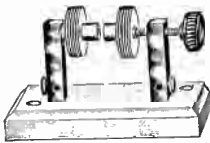
- 63 J 5348..... \$1.48



Zinc Spark Gap

For use with spark coil transmitters. Base is molded composition. Metal parts are plated and polished. Can be used with coils up to 4 inches. Shipping weight, 2 pounds.

- 63 J 5350..... \$1.10

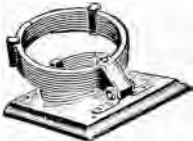


Radiator Spark Gap

Micrometer adjustment. Electrodes of zinc. Cooling vanes aluminum. Metal parts nickel plated. Base glazed porcelain. Will handle over 1 K.W. Ideal for use by amateurs constructing their own spark transmitting sets. Shipping weight, 2 pounds.

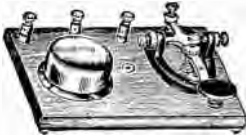
- 63 J 5351..... \$2.30

Murdock Oscillation Transformer



Permits sharp tuning on 200 meter wave. Can be used on sets up to 1 K.W. primary and secondary windings of edgewise-wound copper ribbon. Coupling varied by hinge. Ruggedly built to withstand hard constant usage. Very efficient part for amateur sending stations. Shipping weight, 8 pounds.

- 63 J 5155..... \$4.75



Wireless Practice Set

Anyone learning wireless telegraphy transmission must know the code. Send for a wireless practice set and see how easy it is to learn the code. Set consists of a key and buzzer mounted on a polished wood base. Buzzer reproduces accurately the high pitched sounds of wireless code stations. Connect a dry battery to the binding posts on the set by means of a short piece of wire, press the handle of the key and buzzing sound will be produced. In a very short time your ear will become accustomed to the various combinations of dots and dashes representing different letters and numerals. Practice until you can understand the signals at the speed sent by average stations and you have completed the most difficult part of wireless telegraphy. A very good way to learn the code quickly is to place two of these sets in separate rooms with an operator at each set, and practice sending signals back and forth. Chart included with each set. Base size, 7 by 4 1/2 inches. Shipping weight, 3 pounds.

- 63 J 1750..... \$1.79

Learner's Code Chart

Explains how to learn the code by the sound method, which is recognized as the correct-way. With the aid of this chart you can learn the code faster and more thoroughly. A copyrighted system that gives fast sure results. Printed on durable celluloid in convenient pocket size. Shipping weight, 2 ounces.

- 63 J 1751..... 48¢

Professional Telegraph Set

Regulation instrument used by professional operators. Sounder and key mounted on polished wood base. Frame of sounder polished brass with aluminum lever and hard rubber covered magnets. Key polished brass frame with steel lever, hard rubber knob and circuit breaker. Strongly built throughout. Shipping weight, 3 pounds.



- 63 J 1730—4-ohm combination set..... \$3.78
63 J 1732—20-ohm combination set..... 3.98

Amateur Telegraph Set

Full size key and sounder, mounted on polished oak base. A good instrument for beginners. Price includes up-to-date Operator's Manual containing Morse code; instructions for telegraphing, and other information. Shipping weight, 2 3/4 pounds.



- 63 J 1715—With 4-ohm sounder..... \$2.65
63 J 1719—With 20-ohm sounder..... 2.98

Pony Relay

A relay working in conjunction with each instrument will improve the efficiency of any telegraph system, when several instruments are connected on the same line. Also used on burglar alarm systems. Finely finished. Made of high grade materials. Shipping weight, 2 1/4 pounds. Resistance, 20 ohms.

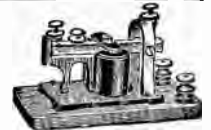


- 63 J 1745..... \$3.35

Sounders

Sounders same as used on our professional combination set. Shipping weight, 24 ounces.

- 63 J 1735—4-ohm sounder..... \$2.30
63 J 1737—20-ohm sounder..... 2.50



Electric Bell Ringing Transformer

Attach transformer to regular lighting wires. Makes current suitable for door bells, buzzers, annunciators or door openers. Registers on meter only when current is used. Produces three voltages—6, 8, and 14. Operates on alternating current of 100 to 120 volts, 60 cycles. Lasts a lifetime. Working capacity, 25 watts. Transformer only, without bell. Shipping weight, 2 pounds.



- 63 J 5921..... \$1.15

Electric Bell

Nickel plated clear-ringing gong. Operates on single ordinary dry cell or from bell-ringing transformer. Very sensitive. Built to last for years. Coils carefully protected. Japanned iron box. Shipping weight, 9 ounces.



- 63 J 5945—2 1/2-inch gong..... 48¢
63 J 5947—3-inch gong..... 53¢
63 J 5949—4-inch gong..... 71¢
63 J 5950—2 1/2-inch gong to operate direct from 30-32-volt current..... 72¢

Insulated Bell Wire

63 J 5960—Single conductor. Size 18. About 150 feet to the pound. Shipping weight, 1 pound. Per pound..... 50¢
63 J 5962—Double conductor. Size 18. Two insulated wires braided. About 65 feet to the pound. Shipping weight, 1 pound. Per pound..... 55¢



Push Buttons

Nicely finished wood push button composition center. Positive spring contact. Shipping weight, 1 ounce.

- 63 J 5935—Each..... 9¢
63 J 5936—Dozen..... 90¢



Insulated Staple

For fastening wires to wall. Insulated saddle eliminates danger of shortcircuiting. Height, 5/8 inch. Shipping weight, 3 ounces.

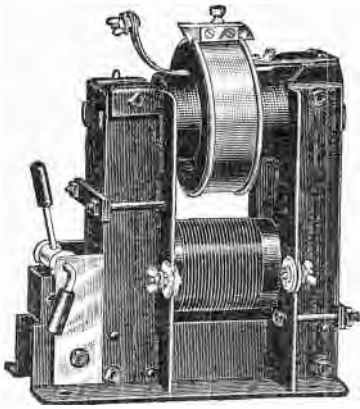
- 63 J 5932—Per 100..... 20¢



Spark Transmission Apparatus

On pages 26 and 27 are shown a complete line of spark transmission apparatus using either batteries or 110-volt 60-cycle A. C. as the source of power. Spark transmission was the original method used for sending

code, and the apparatus used is very simple when compared to that used with the modern transmission methods. Suitable for instruction and experimental use for schools, colleges, etc.



Thordarson Type R Transformer

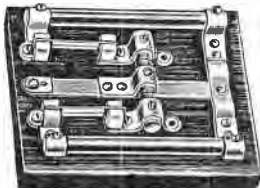
For use on 108 to 115-volt 60-cycle alternating current. Provided with adjustable magnetic leakage gap which controls primary input, giving a wide range of amperage and permitting easy adjustment. No impedance or choke coil necessary in primary circuit. This transformer has some wonderful long distance records and has given general satisfaction to amateurs for years. Works best when used with rotary spark gap producing about 800 sparks per second. Shipping weights, 35 and 55 pounds.

Article Number	K.V.A.	Amperage	Sec. Volt	Price
563 J 630	1/2	1 to 6	10,000	\$21.00
563 J 632	1	2 1/2 to 14	25,000	38.00

Thordarson Type RS Transformer

This type differs from the well known model shown above except in that it does not have the adjustable magnetic shunt. All other features of sturdy, compact construction and correct electrical characteristics are the same. For use on 105 to 120-volt 60-cycle alternating current.

Article Number	K.V.A.	Sec. Volts	Shipping Weight	Price
563 J 633	1/4	8,000	1 1/2 pounds	\$10.00
563 J 635	1	25,000	35 pounds	28.50



Kick Back Preventer

Prevents high frequency surges from discharging back into power line. A necessity when power transformer is supplied from city mains. Two 1000-ohm resistance rods. Mahogany finished base. Connections of strip copper. Ship. wt., 4 lbs. **\$4.80**
63 J 5358



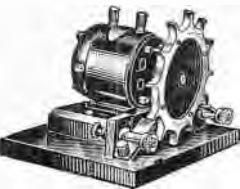
Variable Transmitting Condenser Oil Immersed

An oil immersed variable condenser for use with all makes of transformers up to 1 K.W. 25,000 volts. Phenol fiber dielectric, corrugated aluminum separators allow circulation of oil to keep down heating. Flat aluminum sheet electrodes with rounded corners. Variable in ten steps of .0009 MF each from .0018 MF to .009 MF. Especially designed to prevent corona losses and brush discharge. Oil included. Shipping weight, 35 pounds. **\$25.00**
563 J 620



Commercial Type Oscillation Transformer

Designed to give wave ranges both above and below 200 meters. Solid copper windings on formica supports 10 1/2 inches diameter primary of six turns No. 3 wire. Secondary is 6 1/2 inches diameter of twelve turns No. 5 wire. Mahogany finished woodwork. Two helix clips included. Ship. wt., 26 lbs. **\$16.50**
563 J 648



Improved Model Rotary Spark Gap

Flat pure copper stationary electrodes and cast aluminum rotary electrodes avoid pitting. Width of break is adjustable. Strong breeze generated by rotary electrode quickly quenches spark, thereby allowing transmission of wave of low decrement. All conducting metal is mounted on formica. Easily handles 40,000 volts without endangering

motor windings. Constant steady speed. Shipping weight, 10 pounds.
1/4 K.W. size; 1/2 H.P. Universal motor. For 108 to 115-volt current. Speed 4,000 r.p.m. **\$14.80**
563 J 5142
1 K.W. size; 1/2 H.P. Universal motor. For 108 to 115-volt current. Speed 5,000 r.p.m. **\$18.95**
563 J 5143

Universal Spark Gap Motor

A rugged high grade motor for spark gaps, running sewing machines; fans, small lathes, buffers, emery wheels, etc. Running idle will make 8,000 r.p.m. Will make about 4,000 r.p.m. with electrode shown below. Will operate on 100-125 volt A.C. or D.C. current. Black enamel finish. Height, over all, 5 1/2 inches; 1/4-inch shaft extends 1/2 inch. Will develop about 1/20 H.P. Supplied with 1-inch grooved pulley. Shipping weight, 8 pounds. **\$9.50**
63 J 5624



Spark Gap Electrodes

Saw tooth rotor, 5 3/4 inches diameter, of machine cast aluminum with bakelite center and brass bushing to fit 1/4-inch shaft. Two adjustable stationary electrodes. This set together with universal motor listed above, mounted on a substantial base will make a high grade rotary spark gap. Shipping weight, 1 1/2 pounds. **\$4.50**
63 J 5625



New Style Antenna Switch

A large, sturdy, well built "change over" switch suitable for use on sets up to 1 K.W. Mahogany finish base. Improved support, copper blades. Fitted with third blade to disconnect receiver when sending. Our price on this article shows you a considerable saving. Quick, easy operation. Shipping weight, 3 pounds. **\$2.95**
63 J 5114



Standard Wireless Key

One of the finest keys made for radio work, either spark or C.W. base lever and supports made of heavy brass in lacquered gold finish. Extra large durably hardened contact points. New style knob. Ship. wt., 1 pound. **\$3.48**
63 J 5352



Double Action Wireless Key

Double action which makes for speed. Will improve your sending and lends individuality. Large standards, formica knob, heavy silver contacts suitable for use up to 2 K.W. Mounted on durable and heavy formica base. Metal parts nickel plated. Shipping weight, 1 1/4 pounds. **\$4.65**
63 J 5356



Steel Lever Keys

Steel lever and switch strap are heavily nickel plated and buffed. Black composition knobs on switch and key. Shipping weight, 14 ounces.
63 J 1739—Leg key with legs to go through table or desk. **\$1.85**
63 J 1741—Legless key to screw to top of table or desk. **\$1.97**





Radio Hand Microphone

Portable Handset used when transmitting speech over radio telephone. Being especially designed for radio purposes, it has a properly designed element of correct resistance and current carrying capacity for most efficient results. Fitted with 6-foot cord for connection to modulator circuit, permitting the operator to move about while transmitting. Exposed metal parts nickel plated and polished. Black corrugated handle. Hook for hanging up. Shipping weight, 2 pounds.

63 J 7011 \$6.85

Panel Mount Radio Microphone Set

Mounts firmly on panel, has adjustable enameled pony arm with polished nickel finish microphone. Same high grade construction as above handset. Shipping weight, 2 pounds.

63 J 7012 \$5.25



Kenotrone Rectifier Tube UV 216

Intended for use with 5-watt power tubes and is rated at 20 watts. Changes alternating current taken from household lighting circuit through a power transformer to direct current. This rectified current is then suitable for either plate or filament operation, making unnecessary a motor generator for high voltage required by plate. The output energy is at a maximum for these tubes when the load is such that the D.C. is between 350 and 400 voltage. Using two tubes in a full wave rectification circuit the D.C. and watts output will be doubled. Has standard 4-prong base, 7.5 filament voltage; 2.35 filament current. A.C. input voltage, 550 volts (stepped up from 110 voltage). D.C. output, 20 watts, 350 volts. Shipping weight, 1 pound.

63 J 7020

\$7.50



A. P. 5-Watt Transmitting Tube

This tube has been especially developed for amateur use as an undamped wave transmitter for either radiophone or C.W. telegraph. Operates with plate potential of from 150 to 600 volts, which can be obtained either from batteries, generators or rectified A.C. Special molybdenum grid. By connecting the grid and plate together, this tube may be used as a rectifier. Standard 4-prong base. Shipping weight, 1 pound.

63 J 7030 \$7.50

5-Watt Transmitting Tube Radiotron UV-202

This tube is especially intended for low power radio telephone and C.W. telegraph sets. Two 5-watt tubes in parallel will put about 1.5 amperes into the average amateur aerial using one tube as modulator and one tube as oscillator. Radiophone range of forty miles is obtainable and four times that distance for C.W. telegraph when the two tubes are connected in parallel. Four or five 5-watt tubes can be worked in parallel with increased range. These tubes can be operated on either A.C. or D.C. They may also be used as power amplifiers in radio receiving circuits. The voltage amplification obtained from them is particularly useful for the operation of loud speakers. Has 4-prong base. Filament voltage, 7.5 v. Filament current, 2.35 ampere; plate voltage, 350 volts normal; plate current, .045 ampere. Watts output, 5 watts normal. Shipping weight, 1 pound.

63 J 7015

\$8.00



Tuska Molded C.W. Inductance

A high quality efficiently designed article at an exceptionally low price. Wound on molded bakelite tubes 4 inches in diameter and 6 inches long; 42 turns of bare copper wire wound in molded threads. Carrying capacity, 50 watts. Ship. wt., each, 2 lbs.

63 J 7041—Wound and tapped at every third turn..... \$4.15
63 J 7043—Wound and tapped at every turn..... 4.65
63 J 7045—Tube only threaded but not wound 3.15

63 J 7072

Radio Corporation Catalogue

This is a book listing all of the Radio Corporation products, which are described fully and completely. In addition it contains a very comprehensive treatise on C.W. transmission and other information useful to the radio enthusiast. Also, there are shown a number of transmitting and receiving circuits, wiring diagrams and a list of the apparatus required. Shipping weight, 6 ounces.

63 J 7072 25¢



Transmitting Grid Leaks Radio Corp. UP-1718

Necessary in tube transmitting circuits. Shunted across grid condensers of oscillating tubes, they limit the potential accumulated on the grid of the tube and thus govern the output to the antenna and also the character of the antenna oscillations. Resistance element is embedded in a heat-resisting tube that will withstand sudden and extreme temperature changes. Metal terminals for firm connections. Resistance, 5000 ohms with mid-tap at 2500 ohms. For use with 5-watt transmitting tubes. Size, 1/2 by 5 inches. Shipping weight, 1 pound.

63 J 7024 \$1.10

Oscillation Transformer Radio Corp. UL-1008

This transformer is designed especially for use in tube transmitting circuits. It is also adaptable for use as an auto-transformer of spark set oscillation circuits. Consists of 25 turns of nickel plated copper strips with rounded edges. Offers very little resistance to radio frequency currents, thereby assuring maximum radiation output of low power C.W. transmitters. Securely mounted on a wooden base which has four binding post connections, three of which have flexible conductors and clips for selecting pick-off points on the coil. The clips are easily attached or removed from coil, but when wing nut is tightened they will positively hold their positions and cannot be accidentally moved or detached. All metal parts nickel plated. Polished black finished base. Size, 7 1/2 by 6 1/2 by 9 3/8. Shipping weight, 7 pounds.

563 J 7035 \$11.00



Acme C.W. Inductance

A rugged, flexible and efficient C.W. inductance. Consists of 30 turns of No. 12 B. & S. copper wire, wound on a 5-inch slotted bakelite tube. Taps are brought out at each turn in the form of studs rigidly fastened to the wire and held in place by means of bakelite strips. Five insulated terminals for fastening to connecting wires are supplied. These make a rigid, positive radio frequency contact. Five separate connections may be made on the inductance, each one capable of being varied one turn at a time while the tubes are excited and in operation. Ship. wt., 4 pounds

563 J 7037 \$8.00



Acme Grid Coils

For use in circuits which require a grid coil. Consists of 25 turns of wire wound on a 4-inch bakelite tube. Tapped at fifteenth turn, making three variations possible, namely, 10, 15 and 25 turns. Fits inside of Acme C.W. Inductance listed above. Shipping weight, 2 pounds.

63 J 7050 \$2.00

C.W. Inductance With Sliders

Consists of 40 properly spaced turns of No. 10 bare copper wire, mounted on a formica tube 4 inches in diameter. Positive, 100 per cent electrical contact can be instantly made on any turn by means of heavy phosphor sliders moving on a solid 1/4-inch rod over the entire length of the inductance. Readily adapted to either table or back panel mounting. Heavy terminals are provided for making external connections. Ship. weight, 2 pounds.

563 J 7039 \$7.50



Porcelain Transmitting Socket

The proper socket for transmitting tubes. Bases of porcelain, which is the ideal material for this purpose on account of its low specific inductive capacity and its high insulating qualities. Shipping weight, 8 ounces.

63 J 7022 95¢

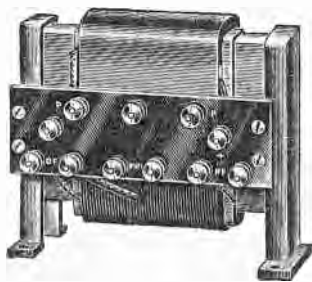


Aerial Change-Over Switch

A neat compact switch for stations doing transmitting and receiving. Enables you to instantly change from receiving to transmitting and vice versa. Throwing the switch into the sending position closes the power circuit and the antenna circuit of the transmitting side. Changing the switch to the receiving position, the power is first cut off, then the aerial is drained and finally the receiving circuit is closed. Formica base and vertical supports. Metal parts satin, nickel finish; 5 inches long, 3 inches wide, 4 1/2 inches high. Binding posts for all connections. Shipping weight, 2 pounds.

63 J 7052 \$8.50





Acme C.W. Power Transformers Combine Plate and Filament

These transformers are used to step up 110-volt 60-cycle A. C. to voltages used in C.W. transmission. High voltage current obtained from these transformers when passed through the proper combination of rectifiers, choke coils and condensers is applied to the plate as a direct current and is suitable for both radio telephony and telegraphy. Low voltage current is applied to the filament without rectification. Mounted

type is securely mounted on standards and all connections are brought out to a formica panel with binding post connections plainly marked.

75-Watt Output Capacity

Plate voltage, 375 volts; plate current, 100 milliamperes; filament voltage, 10 volts; filament current, 5 amperes. These transformers will supply plate and filament voltages and current for two 5-watt tubes.

563 J 7060—Mounted. Shipping weight, 10 pounds. **\$15.00**
563 J 7062—Unmounted, core and coils assembled. Shipping weight, 8 pounds. **12.00**

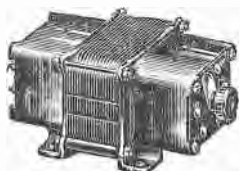
200-Watt Output Capacity

Plate voltage, 750 and 550 volts either side of center. Plate current, 250 milliamperes maximum; filament voltage, 10 volts for each winding; filament current, 5 amperes for each winding. This transformer will supply plate and filament voltage and current for four 5-watt tubes; 750-volt side is used with electrolytic rectifier; 550-volt side used with rectifying tube.

563 J 7064—Mounted. Shipping weight, 12 pounds. **\$20.00**
563 J 7066—Unmounted with core and coils assembled. Shipping weight, 10 pounds. **16.00**

Radio Corporation Power Transformers

UP-1368—Maximum Input 32½ Watts



This transformer connected to alternating current 102 to 115 volts, 50 to 60 cycles, will deliver proper voltages and current for plate and filament of Radiotron UV-202, 5-watt transmitting tubes. As many as four tubes can be handled and the current produced when passed

through proper combination of rectifiers, choke coils and condensers is suitable for radio, telephony in addition to C.W. or interrupted C.W. telegraphy. Plate winding output is 125 watts, 550 or 1,100 volts. Filament winding output, 75 watts, 3.75 or 7.5 volts. When transformer is connected to power line of from 102 to 115 volts no filament rheostat is necessary. Shipping weight, 10 pounds.

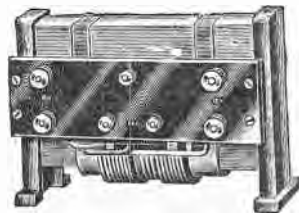
563 J 7070..... **\$25.00**

Thordarson Special Transformers

Designed to handle one 5-watt tube. Wiring diagrams are supplied with each transformer, which shows how some very remarkable results can be obtained on either C.W. telephony or telegraphy. For stations where a range of only 10 to 15 miles is required, this transformer with the other necessary accessories can be built into a very efficient set at a low cost. Plate voltage, 650 volts; filament voltage, 10 volts. Built shell type unmounted only. Shipping weight, 5 pounds.



563 J 7075..... **\$7.50**

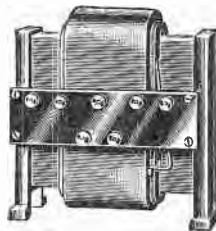


C.W. Plate Transformer

The ideal way for operating a C.W. set is to use a separate transformer for both plate and filament circuits. Not only is the secondary current easier to handle, but the key can be put in the primary side of the transformer. Will supply the plate voltage and current for up to six 5-watt tubes, or one 50-watt tube, 250-watt capacity; secondary voltages of 550 and

1,100 volts; secondary current 200 milliamperes at 1,100 volts and 400 milliamperes at 550 volts. The mounted type is supplied with cast standards and is fitted with a formica panel on which are mounted binding post connections, all plainly marked. Unmounted type is supplied with core and coils assembled. Shipping weights, 12 and 14 pounds.

563 J 7077—Mounted..... **\$20.00**
563 J 7078—Unmounted..... **16.00**



C.W. Filament Heating Transformers

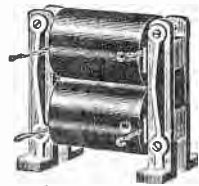
These transformers are used in conjunction with plate transformers listed below and replace batteries for heating filaments, the A. C. current supplied being satisfactory for this purpose without rectification; 110-volt 60-cycle A. C. primary; two secondary voltages of 8 and 12 volts. A center tap is provided on the secondary winding in order to connect the grid circuit to a point whose potential does not alternately change from plus to minus. Provided with a rheostat in the

primary for filament control. Also provided with condensers permanently connected across the secondary to provide a bypass for high frequency currents. Shipping weights, 75-watt, 12 pounds; 150-watt, 14 pounds.

563 J 7082—75-watt, mounted..... **\$12.00**
563 J 7083—75-watt, unmounted..... **9.00**
563 J 7084—150-watt, mounted..... **16.00**
563 J 7085—150-watt, unmounted..... **13.00**

Acme Choke Coils 1½ Henries

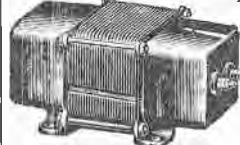
Choke coils are used to smooth out the pulsations in the direct current supply to keep a constant potential current when modulating. Also prevent high frequency from backing up in the power supply. Best results are obtained with a coil in each side of the line. The double coil is used for this purpose. Shipping weight, each, 3 pounds.



63 J 7101—150 MA capacity, single coil..... **\$4.00**
63 J 7102—150 MA capacity, double coil..... **6.00**
63 J 7103—500 MA capacity, single coil..... **6.00**
63 J 7104—500 MA capacity, double coil..... **8.00**

Radio Corp. Filter Reactors

Mounted UP-1626—160 Milliamperes



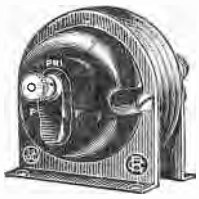
These reactors are used to smooth out the high voltage current supplied to the plate circuit of a transmitting tube. Previous practice has been to supply a relatively small inductance unit for this purpose with a group of large capacity condensers. It is more economical, however, to provide a large inductance unit and a

relatively small capacity condenser. This reactor was specially developed with this fact in mind. Will operate with any circuit employing from one to five power tubes. Shipping weight, 10 pounds.

563 J 7105..... **\$11.50**

Radio Corp. Plate Circuit Reactor UP-415

Radio telephone circuits using one or more tubes as oscillators and one or more additional tubes as modulators, require a reactor in series to the plate circuit to maintain the D. C. supply voltage to the plate at constant value. Has an inductance of one henry at audio frequencies. D. C. resistance, approximately 64 ohms. Shipping weight, 1½ pounds.



63 J 7110..... **\$5.75**

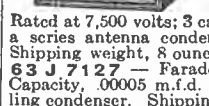
Filter Condensers

Carefully made. Mounted in flat metal cases, size 4¾ by 5¼ by 1½ inches. Connecting leads at end of case. Shipping weight, 1 pound.

63 J 7115—750-volt. Capacity, 0.5 m.f.d..... **\$1.35**
63 J 7116—750-volt. Capacity, 1.0 m.f.d..... **1.85**

Condensers for C.W. Transmitter Sets

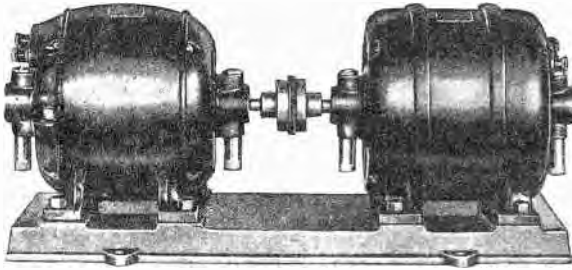
63 J 7125—Faradon type UC-1014. Capacity, .0025 m.f.d.; voltage, 3,000 volts. Used as a grid condenser, radio frequency bypass condenser or blocking condenser. Shipping weight, 8 ounces. Each..... **\$2.50**
63 J 7126—Faradon type UC-1015. Rated at 7,500 volts; 3 capacities, .0003, .0004, .0005 m.f.d. Used as a series antenna condenser or an intermediate circuit condenser. Shipping weight, 8 ounces..... **\$5.75**
63 J 7127—Faradon type UC-1803. Rated at 10,000 volts. Capacity, .00005 m.f.d. Intended to be used as a blocking or coupling condenser. Shipping weight, 10 pounds..... **\$5.00**



Radio Motor Generators

These motor generators are specially designed to supply plate circuit current for transmitting tubes. Connect them up with any power circuit and they deliver current of the proper voltage and amperage. Very rugged four bearing construction and will deliver rated capacities on continuous run. The motor supplied is for standard 110-volt 60-cycle alternating current, but sets with motor for any current can be made up to order.

Article Numbers	Voltage Output	Watts Output	Will Handle Tubes	Price	Shipping Weight
163 J 696	300	15	One 5-Watt	\$42.35	20 pounds
163 J 697	350	40	Two 5-Watt	64.75	41 pounds
163 J 698	500	150	Six 5-Watt	97.50	100 pounds
163 J 699	1,000	250	Two 50-Watt	138.50	105 pounds



The Radio Dynamotor

To Operate From 32-Volt Direct Current

This combination dynamo and motor operates from 32-volt farm electric plant or motorboat plant current.

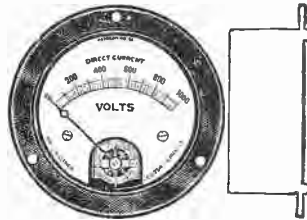
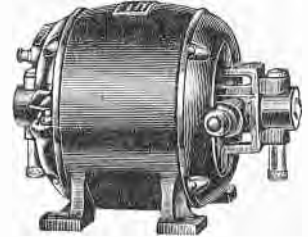
Connect the motor to the 32-volt current and the generator produces 500 volts, 75 watts, which will take care of four tubes, two oscillators and two modulators. This generator with the other proper accessories can be built up into a transmitting set having a radiophone range of 50 miles and upward. Shipping weight, 45 pounds.

163 J 688—Price..... \$82.50

6-Volt Radio Dynamotor

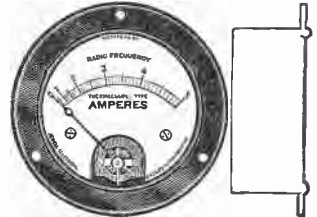
Will operate on a 6-volt storage battery. Just the machine for a portable set. Can be used on automobile, in motorboat, or in the station. Entirely enclosed. Very rugged and durable. Delivers 350 volts, 15 watts. Will handle one 5-watt tube nicely. Net weight, 18 pounds. Shipping weight, 30 pounds.

163 J 689..... \$45.00



Jewell Radio Meters

These meters are made by the Jewell Electrical Instrument Company. They are high quality instruments that have proven very satisfactory for radio work. Are very ruggedly built. Genuine sapphire bearings. Can be mounted flush on panel. Two sizes of instruments are supplied. We carry in stock and can make prompt shipment on meters with the calibrations more commonly used. We can also supply meters of any other calibrations within approximately 10 days after receipt of order. All meters have black enameled flanges with white faces and accurate handdrawn scales. Shipping weights, each, 1 1/2 to 3 pounds.



Direct Current Ammeters Pattern 54

Flange diam., 3 3/4 inches; case diam., 3 inches.
63 J 7140—0-1 1/2 amperes..... \$6.95
63 J 7141—0-5 amperes..... 6.95

Pattern 33

Flange diam., 3 1/4 inches; case diam., 2 1/2 inches.
63 J 7145—0-1 1/2 amperes..... \$5.40
63 J 7146—0-5 amperes..... 5.40

Direct Current Voltmeters

Pattern 54. Flange diam., 3 3/4 in.; case diam., 3 in.
63 J 7160—0-10 volts..... \$6.95
63 J 7161—0-15 volts..... 6.95
63 J 7162—0-30 volts..... 6.95
63 J 7163—0-50 volts..... 6.95
Pattern 33. Flange diam., 3 1/4 in.; case diam., 2 1/2 in.
63 J 7170—0-10 volts..... \$5.40
63 J 7171—0-15 volts..... 5.40
63 J 7172—0-30 volts..... 5.40
63 J 7173—0-50 volts..... 5.40
63 J 7164—0-125 volts..... 13.95
63 J 7165—0-500 volts..... 19.95
63 J 7166—0-1000 volts..... 19.95

Direct Current Milliamperes Meters

Pattern 54. Flange diam., 3 3/4 in.; case diam., 3 in.
63 J 7150—0-10 milliamperes..... \$6.95
63 J 7151—0-30 milliamperes..... 6.95
63 J 7152—0-300 milliamperes..... 6.95
63 J 7153—0-500 milliamperes..... 6.95
Pattern 33. Flange diam., 3 1/4 in.; case diam., 2 1/2 in.
63 J 7155—0-10 milliamperes..... \$5.40
63 J 7156—0-30 milliamperes..... 5.40
63 J 7157—0-300 milliamperes..... 5.40
63 J 7158—0-500 milliamperes..... 5.40

Filament Rheostat Radio Corporation PR 535

Designed especially to regulate power tube filament current. Heat-resisting molded base 2 1/2 inches diameter, with two concentric give four windings which can be arranged to give four separate values of—2.5 ohms, 1.2 amp.—3.5 ohms, 1.2 amp.—1.5 ohms, 2.5 amps.—6 ohms, 1/2 amp. Shipping weight, 1 pound.

63 J 7198..... \$3.00

Fada Power Tube Rheostat

A well designed, well made, moderately priced rheostat; 5 ampere capacity, 1 1/2 ohms resistance. Base will stand heat up to 600° F. Easy connections. Can be mounted on panels up to 1/2 inch thick. Base diameter, 2 1/4 inches. Shipping weight, 1/2 pound.

63 J 7197..... \$1.35



Radio Frequency Ammeter. Pattern 64

An antenna radio frequency ammeter is a necessity to properly control the operation of a C.W. tube set. These meters are of the thermo-coupled type, which makes a very high class instrument. Indicate current radiated very accurately even after long usage.

Flange diam., 3 3/4 inches; case diam., 3 1/4 inches.
63 J 7180—0-1 1/2 amperes..... \$11.25
63 J 7181—0-3 amperes..... 11.25
63 J 7182—0-5 amperes..... 11.25
63 J 7183—0-10 amperes..... 11.25

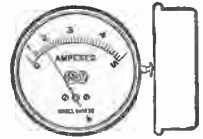
Alternating Current Voltmeters and Ammeters

Pattern 74. Very accurate, steady readings. Flange diam., 3 3/4 inches; case diam., 3 1/4 inches.
63 J 7185—0-5 amperes..... \$7.20
63 J 7190—0-10 volts..... 7.20
63 J 7191—0-15 volts..... 7.20

Antenna Ammeters Radio Corporation UM 530 and UM 532

These ammeters are of the hot wire type. They are fairly accurate and will remain so through a long period of use. Sensitive to slight current variations. These meters are not as accurate nor durable as the thermo-coupled type listed above. Provided with special pointer adjustment. Mount on front of panel. Diameter, 2 1/2 inches; thickness, 3/4 inch. long studs. Shipping weight, 1 pound.

63 J 7186—0-2.5 amperes..... \$6.00
63 J 7187—0-5.0 amperes..... 6.25



Motor Driven Chopper Type PX-1638

For C.W. Tube Transmitters

Used for I.C.W. telegraphy. Can be driven by any motor to produce 1725 r.p.m. Gives positive interruption without adjustment. Note obtained can be varied to any desired pitch by changing the driving motor speed. No modulating tubes required. Produces results much superior to buzzer modulators. Bushed to fit 3/8-inch diameter shaft. Price includes chopper wheel, brush holder and brush. No motor included.

63 J 7090—Shipping weight, 3 pounds..... \$7.25
63 J 7091—Adapting bushing for 1/4-inch shaft. Each..... .20
63 J 7092—Adapting bushing for 3/16-inch shaft. Each..... .20



Paragon C. W. Radio Transmitter

Type 2-5-U

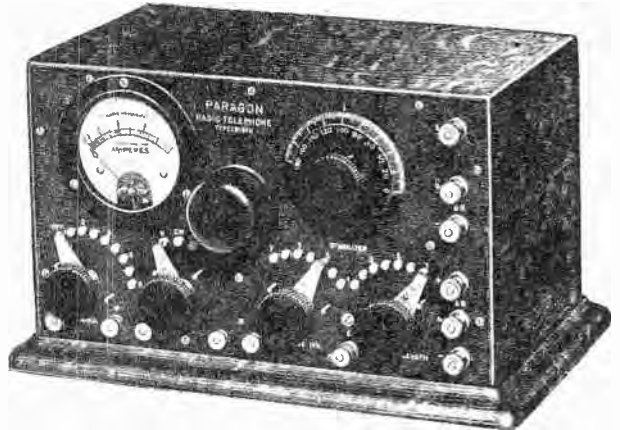
For Radio Telephony or
Telegraphy Transmission

This is the simplest and most efficient small power set on the market. It is designed to use two 5-watt transmitting tubes of any standard make and will operate on one or both tubes. Can be switched instantly from telephone to telegraph transmission.

With proper accessory equipment, we guarantee a range of 35 miles by voice. On tests made in Chicago we have consistently worked 100 miles by voice. On numerous occasions we have been heard over 600 miles distant. The code range is considerably greater. The modulation is excellent and is obtained by the special Paragon method. With the average antenna, wavelengths lying between 180 and 325 meters are obtainable. Shorter wavelengths may be had by inserting a Variable Air Condenser in the antenna circuit. Longer wavelengths may be had by inserting an inductance in the antenna lead. The plate inductance control and the stabilizer grid control make it possible to adapt the transmitter to the average antenna and obtain perfect modulation immediately. This is a wonderful feature, as some sets require weeks of experimenting and then never reach the perfect modulation that one gets with the Paragon 2-5-U with a few minutes' adjustment. The filament current can be D.C. from batteries, or stepped down A.C. plate current is best obtained from a motor generator. We recommend one of our 350 or 500-volt sets. Rectified A.C. can also be used with good results. All necessary accessories for rectifying A.C. are listed on the preceding three pages. Plate current can also be taken from "B" batteries. A battery voltage of from 100 volts up will give working ranges of several miles. When using either D.C. generator supply or A.C., it is necessary to pass the current through a filter system in order that fluctuations in current may be smoothed out. Where installation is made in isolated points such as on farms, ranches or small vessels, power may be supplied by storage batteries, filament being lit directly from the battery, and the same battery may be used for driving a motor generator for the plate supply current.

Details

The Wave Change Switch gives choice of seven different wavelengths. On the average amateur antenna this means seven wavelengths between 180 and 325 meters.



The Transmission Control Switch makes provision for telephone, and tone or continuous wave telegraphy, there being one position for each. Terminals are provided for microphone and key. Buzzer is mounted in center of panel.

Plate Inductance Control (7 point) and Stabilizer (grid control) make it possible to adapt this transmitter to any antenna immediately.

The 8-Point Rheostat has a current capacity of 5 amperes and provides ample regulation for any tube whether it calls for 6, 8 or 10 volts on filament.

Ammeter reads 1 ampere full scale. A shunt gives the meter a 2-ampere capacity. The shunt may be removed where antenna used has comparatively high resistance.

Formica Panel, grained finish. Engraved lettering filled white. Metal parts polished nickel. Case, heavy quartered oak, fine dark, rubbed finish. Hinged top gives quick access to interior. Paragon Standard Tube Sockets. Inductances wound on formica tubing. Heavy wiring protected by insulating tubing. Standard mica condenser across "B" battery. Terminals provided for "Antenna," "Earth," "A" and "B" Battery.

This transmitter has worked telephone over a distance of 15 miles during daylight, using one UV-202 and 100 volts "B" battery, and has worked on various occasions over 600 miles at night time, using two 5-watt tubes with 350 volts. Shows 1.25 amperes radiation on 7.5 ohm antenna, using two UV-202 vacuum tubes on 350 volts. Phone modulation has been pronounced "perfect."

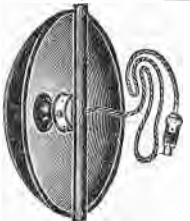
Panel measures: Length, 11 1/4 inches; height, 6 1/2 inches. Depth of case (inside), 6 1/2 inches. Shipping weight, 12 pounds. **\$70.00**
563 J 672—Without microphone, tubes or key.



Magnavox Transmitter Phonograph Tone Arm

Consists of a standard phonograph reproducer directly connected to a special Magnavox microphone to which is connected two wires leading to transmitting set. Can be attached to any phonograph without interfering with the regular tone-arm and will play any type of disc record. Universally used by broadcasting stations for transmitting phonograph music. Simply connect two wires from Magnavox tone-arm in place of microphone. Shipping weight, 4 pounds.

563 J 7201..... **\$37.50**

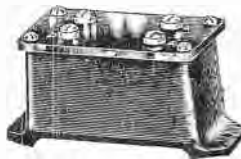


Magnavox Bowl Shaped Transmitter

A special voice and sound collecting transmitter used for transmitting speeches, sermons, concerts by orchestras, etc. Eliminates the necessity of holding a transmitter. Large 15-inch wooden bowl gathers sound and delivers it to microphone mounted at sound focal point. Complete with connecting cord and plug. Ship. wt., 5 pounds. **\$30.00**

563 J 6362..... **\$30.00**

Modulation Transformer, Inductance Type
This transformer has a primary and secondary winding mounted on a laminated core. The winding ratio is designed particularly for use with Radiotron UV-202 and Cunningham 302-5-watt transmitter tubes. Gives maximum modulation possible without distortion. Ship. wt., 1 1/2 lbs. **\$4.75**
63 J 7210.....



Magnetic Modulators for Radio Telephony Radio Corporation UT-1643 and UT-1357

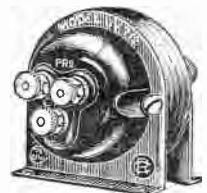
These modulators work on the same principle as those used in high powered transmitting stations. Once connected to a radio telephone they require no further adjustment or attention. Best of results can be obtained even without previous experience. Simple in design and operation. Magnetic modulation is claimed to be the only non-distorting method of controlling the output of a single tube for radio telephony. It also permits the parallel use of a number of tubes as oscillators and thus eliminates the use of special modulator tubes with their necessary additional accessories and critical adjustments.

563 J 7205—UT-1643, 1/2 to 1 1/2 amperes. Shipping **\$9.50**
weight, 2 pounds.

563 J 7206—UT-1357, 1 1/2 to 3 1/2 amperes. Shipping weight, 3
pounds..... **\$12.00**

Microphone Transformer Radio Corporation UP-414

The characteristics of this transformer are such that with a suitable microphone and a battery of four dry cells connected in series with the primary coil, a secondary voltage is obtained which will provide effective control of the radiated energy. Also provided with a side tone winding which may be connected to the telephone of a receiving set while transmitting, thus enabling the operator to check the operation of his microphone. Shipping weight, 1 1/2 pounds. **\$7.25**
63 J 7212.....



Impossible

It Is Easy to Order Radio Outfits and Supplies from this Catalogue

IN this catalogue, we show a complete line of high grade radio outfits and supplies, from which you may choose the equipment best suited for use in your home. You may select a complete outfit ready for use, or if you prefer to construct your own outfit, this catalogue will enable you to order all of the necessary equipment. In either event, you may rest assured that your order will be filled to your complete satisfaction. For your convenience when ordering, we have enclosed with this catalogue, an order blank on which to write your order; however, you may use a plain piece of paper if you desire.

How to Order

The first thing you should do when ordering is to give us your correct address and shipping instructions so the merchandise will reach you promptly. Write your full name and address plainly. Give street and number (or R. F. D. and box), and post office. Also shipping point if it is different from post office. Each family should order under one name only, preferably the name of the head of the household.

Then go through this catalogue selecting the outfit or equipment you want, and give the following information:

1. Give article number of each item, quantity desired, name of article, and other information according to the outfit or equipment you order.
2. State the exact amount of money sent us with your order. Send remittance in the form of a post office money order, bank draft, or personal check. If currency, be sure to send by registered mail.
3. Shipping instructions: Be sure to give full shipping information. If you want your order shipped by parcel post, or prepaid express, send additional money to pay transportation charges. We will return any balance due you after we have paid shipping charges.

The 50th Year of Our Golden Rule Guarantee

Guarantee: It is our intention that every article in this book shall be truthfully described and be exactly as pictured. Therefore, we guarantee everything you buy from us to be satisfactory to you in every detail and to reach you in perfect condition.

You take no risk whatever in sending us your order, for unless you are completely satisfied with the goods and with your saving, you may send back anything you buy from us and we will promptly return your money and all transportation charges you have paid.

MONTGOMERY WARD & CO.

All merchandise in this catalogue shipped from Northern Illinois

Scale of Parcel Post Charges

Radio Outfits and Supplies when shipped by mail take parcel post rates. When figuring parcel post charges, consult this scale.

Weight of Packages	For Shipments to Our Customers in Chicago	Not Over 150 Miles from Chicago	151 to 300 Miles from Chicago	301 to 600 Miles from Chicago	601 to 1000 Miles from Chicago
	Local Zone	1st and 2nd	3rd	4th	5th
4 oz. to 1 lb.	\$0.05	\$0.05	\$0.06	\$0.07	\$0.08
2	.06	.06	.08	.11	.14
3	.06	.07	.10	.15	.20
4	.07	.08	.12	.19	.26
5	.07	.09	.14	.23	.32
6	.08	.10	.16	.27	.38
7	.08	.11	.18	.31	.44
8	.09	.12	.20	.35	.50
9	.09	.13	.22	.39	.56
10	.10	.14	.24	.43	.62
11	.10	.15	.26	.47	.68
12	.11	.16	.28	.51	.74
13	.11	.17	.30	.55	.80
14	.12	.18	.32	.59	.86
15	.12	.19	.34	.63	.92
16	.13	.20	.36	.67	.98
17	.13	.21	.38	.71	1.04
18	.14	.22	.40	.75	1.10
19	.14	.23	.42	.79	1.16
20	.15	.24	.44	.83	1.22
21	.15	.25	.46	.87	1.28
22	.16	.26	.48	.91	1.34
23	.16	.27	.50	.95	1.40
24	.17	.28	.52	.99	1.46
25	.17	.29	.54	1.03	1.52
26	.18	.30	.56	1.07	1.58
27	.18	.31	.58	1.11	1.64
28	.19	.32	.60	1.15	1.70
29	.19	.33	.62	1.19	1.76
30	.20	.34	.64	1.23	1.82
31	.20	.35	.66	1.27	1.88
32	.21	.36	.68	1.31	1.94
33	.21	.37	.70	1.35	2.00
34	.22	.38	.72	1.39	2.06
35	.22	.39	.74	1.43	2.12
36	.23	.40	.76	1.47	2.18
37	.23	.41	.78	1.51	2.24
38	.24	.42	.80	1.55	2.30
39	.24	.43	.82	1.59	2.36
40	.25	.44	.84	1.63	2.42
41	.25	.45	.86	1.67	2.48
42	.26	.46	.88	1.71	2.54
43	.26	.47	.90	1.75	2.60
44	.27	.48	.92	1.79	2.66
45	.27	.49	.94	1.83	2.72
46	.28	.50	.96	1.87	2.78
47	.28	.51	.98	1.91	2.84
48	.29	.52	1.00	1.95	2.90
49	.29	.53	1.02	1.99	2.96
50	.30	.54	1.04	2.03	3.02

Note: Packages weighing more than fifty pounds cannot be shipped beyond the third zone.

No package having a combined length and girth of more than seven feet can be shipped by parcel post.



Radio Book for Boys
By A. Hyatt Verrill

It gives a history of radio, describes instruments and accessories, tells of their functions and construction, how to operate them, what they cost, and what may be expected of them. An up-to-date, concise, simply written book. 170 diagrams. Cloth bound. Size, 5 1/2 by 8 inches. **\$1.85**
57 J 3566.....
Postage, 8¢ extra

Newest Books on Radio Telephony and Telegraphy



The Operation of Wireless Telegraph Apparatus
Written in simple language. Explains the operation of wireless telegraph apparatus. Includes International Radio abbreviations. 87 pages. Size, 5 by 7. Paper bound. **\$1.30**
57 J 3580.....
Postage, 4¢ extra

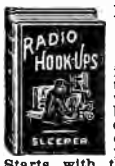


Lessons in Wireless Telegraphy
Thirty-five lessons. A systematic course in the elementary principles, written in simple language. 72 pages. Size, 5 by 7 inches. 66 illustrations. Paper bound. **\$1.30**
57 J 3581.....
Postage, 4¢ extra

The Home Radio
How to Make and Use It
By A. Hyatt Verrill



Intended particularly for the use of amateurs and those who wish to know how to make use of or adjust wireless telephone instruments. 16 pages of diagrams—144 pages. Cloth bound. Size, 4 1/2 by 6 1/2 in. **\$1.65**
57 J 3567.....
Postage, 8¢ extra



Radio Hook-Ups
By M. B. Sleeper

This book is indispensable to the radio amateur who designs to build his own receiving apparatus or to the radio experimenter. Starts with the simple crystal detector and works up. Size, 5 1/2 by 7 1/4 inches. Cloth bound. 86 diagrams. **\$1.65**
57 J 3564.....
Postage, 8¢ extra

Radio for Everybody
By A. Descarbours



Easily understood and easily applied. Gives complete descriptions of various kinds of apparatus, and explains which to use to meet your needs and location. A complete guide to practical radio communication. 380 pages, 100 illustrations. Cloth bound. **\$1.37**
57 J 3568.....
Postage, 8¢ extra



Wireless Telegraphy and Telephony Simply Explained
By Alfred P. Morgan

This is undoubtedly one of the most comprehensive books on this interesting subject. Will enable you to master the details of wireless transmission. Written in simple language so anyone can understand it. 154 pages, 156 illustrations. Size, 5 by 7 1/4 inches. Cloth bound. **\$1.38**
57 J 3565.....
Postage, 8¢ extra

Design Data for Transmitters and Receivers
By M. B. Sleeper



One of the first books a beginner should buy. Takes up in proper sequence the problems encountered in receiving sets for short, medium and long wave work. Also spark coils, transformers, and vacuum tube transmitters operating on 200 meters. Size, 5 by 7 1/4 inches. 85 pages. Cloth bound. **\$1.65**
57 J 3569.....
Postage, 8¢ extra

The Wireless Experimenter's Manual
By E. E. Bucher

Touches every basic principle of wireless. Includes tables for computation. Written in simple language that is easy to understand. 340 pages. 306 illustrations. Cloth bound. Size, 5 1/2 by 9 1/4 inches. **\$2.10**
57 J 3582.....
Postage, 11¢ extra

Experimental Wireless Stations
By P. E. Edelman



The first and most complete book giving all of the recent important radio improvements, some of which have never before been published. It not only explains how to make equipment, but how to make apparatus to hear all telephoned and telegraphed radio messages. Vacuum tube circuits, amplifiers, long distance sets, loop, coil, underground receivers, table of wavelengths, capacity, inductance—such are a few of the subjects presented in detail. 27 chapters—392 pages—167 illustrations. Size, 5 1/2 by 7 1/4 inches. Cloth bound. **\$2.43**
57 J 4028.....
Postage, 11¢ extra

Practical Wireless Telegraphy
By E. E. Bucher

Explains wireless transmission and reception of telegraphic code. Includes a series of test questions and hookups. 336 pages. Illustrated. Size, 6 1/2 by 9 1/4 inches. Cloth bound. **\$2.10**
57 J 3584.....
Postage, 11¢ extra



How to Make Commercial Type Radio Apparatus
By M. B. Sleeper

For the man who builds and designs his own equipment there is a lot of satisfaction in knowing that his apparatus is comparable to that of commercial design. This book describes in detail many commercial types of transmitting spark and vacuum tube sets, both telephone and telegraph. 98 illustrations. Cloth bound. Size, 5 1/2 by 7 1/4 inches. **\$1.65**
57 J 3571.....
Postage, 8¢ extra

Construction of New Type Transatlantic Receiving Sets
By M. B. Sleeper

In addition to listening to ships and broadcasting stations on short wavelengths, there is a peculiar fascination about listening to high power stations of foreign countries. Apparatus for long distance reception are fully described in this book. Size, 5 1/2 by 7 1/4 in. Cloth bound. **\$1.65**
57 J 3572.....
Postage, 8¢ extra

Construction of Radiophone and Telegraph Receivers for Beginners
By M. B. Sleeper

The man who wants the real thrill of accomplishment builds his own radio apparatus. Radio men can follow the data in this book with confidence. Size, 5 1/2 by 7 1/4 in. **\$1.65**
57 J 3573.....
Postage, 8¢ extra

Vacuum Tubes in Wireless Communication
By E. E. Bucher



It deals with the most vital radio apparatus. Completely describes the vacuum tube and its operation. 202 pages. Illustrated. Size, 6 1/2 by 9 1/4 inches. Cloth bound. **\$2.10**
57 J 3585.....
Postage, 11¢ extra



Radio Instruments and Measurements
Tables and formulae from the Bureau of Standards, Department of Commerce, Washington, D. C., that every radio operator and experimenter should have. 330 pages. Size, 5 by 7 1/4 inches. Cloth bound. **\$1.65**
57 J 3586.....
Postage, 8¢ extra

By Alfred N. Goldsmith



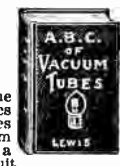
Devoted exclusively to transmission and reception of wireless telephony. Illustrated, showing apparatus connections. 247 pages. Size, 6 1/2 by 9 1/4 inches. Cloth bound. **\$2.35**
57 J 3587.....
Postage, 11¢ extra



By M. B. Sleeper

This new book tells how to build a simple beginner's outfit. The apparatus is of such simple design that it may be made by the average amateur mechanic in his own workshop and at small cost. Size, 5 by 7 1/4 inches. Paper bound. **\$1.30**
57 J 3574.....
Postage, 4¢ extra

The A B C of Vacuum Tubes Used in Radio Reception
By E. H. Lewis



A book for the person who wishes to know what goes on inside a vacuum tube when used in a radio receiving circuit. No previous technical knowledge is necessary to understand it. Illustrated. Cloth bound. Size, 5 by 7 1/4 inches. **\$1.85**
57 J 3575.....
Postage, 8¢ extra

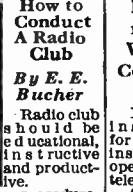


Practical Amateur Wireless Stations

Everything clearly and simply explained. Shows how to build your station. Contains full information and suggestions for the amateur. 136 pages. Size, 6 by 9 inches. Paper bound. **\$1.30**
57 J 3588.....
Postage, 4¢ extra



Wireless Construction and Installation
A practical handbook giving instructions for the construction and operation of boys' wireless outfits. The young experimenter wishing to progress further will find this a valuable book. Size, 5 by 7 inches. 74 pages. Paper cover. **\$1.30**
57 J 3576.....
Postage, 4¢ extra



How to Conduct a Radio Club
By E. E. Bucher

Radio club should be educational, instructive and productive. Parliamentary procedure, indoor and outdoor experiments, 5000 mile receiving set and many other features. Size, 6 1/2 by 9 1/4 inches. 148 pages, fully illustrated. Paper cover. **\$1.65**
57 J 3577.....
Postage, 8¢ extra



Experimental Wireless Construction
Detailed instructions for building, installing and operating amateur wireless telegraph apparatus. A companion volume of the book "Wireless Construction and Installation for Beginners," by the same author. 86 pages. 93 illustrations. Paper cover. Size, 5 by 7 inches. **\$1.30**
57 J 3578.....
Postage, 4¢ extra

How to Pass the U. S. Government Wireless License Examinations
Complete and valuable for the young man about to go in for professional wireless operation. 142 Government examination questions answered. 95 pages. Size, 6 1/2 by 9 1/4 inches. Paper bound. **\$1.65**
57 J 3589.....
Postage, 8¢ extra

Our Special Complete Radio Receiving Outfit

An Outfit which Represents the Highest Development in Radio Receiving

Simple to Operate—Best Results

Price Complete **\$59⁵⁰**

Our special complete receiving outfit is one of the very best on the market. It will equal in results any receiving outfit of its type, regardless of cost. Everything is complete—nothing extra to buy. You can take the materials we send you, put up the aerial wire, connect the instruments, which is easy to do, and in less than half an hour you can be receiving signals, radio music, lectures, stock reports, market reports, or any other radio program being sent out within your range.

While this outfit was especially designed for radio telephone receiving, it will give equally good results for radio telegraph reception, while making tests at Chicago the Detroit broadcasting station was regularly heard. Besides, Pittsburg and other stations were often tuned in. It must be understood, however, that no range can be guaranteed for this or any other radio set, as atmospheric conditions, season of the year, time of day, geographic location, and the power of the transmitting station entirely control the effectiveness of radio equipment. Wavelength range—180 to 600 meters, which in-

cludes broadcasting stations, amateur and commercial ship and land stations.

Technical Description of Combined Tuner and Detector: This is a single circuit type regenerative tuner requiring only very simple adjustments. It is licensed under Armstrong patents. Tuning circuit is directly connected to the detector and consists of a high grade condenser, in series with an inductance having six taps and controlled by a switch lever. Regeneration is obtained by means of a tickler coil, mounted inside of the antenna inductance, which is wired in the plate circuit. Both condenser and tickler coil are controlled by dial mounted on panel, making tuning simple and rapid. Grid condenser in detector circuit. Tube socket of high grade molded composition. Finely graduated rheostat controls filament current. Panel is molded in one piece with engraved markings filled with contrasting white enamel. Fine mahogany finished cabinet with hinged top. Plainly marked binding posts for all connections.

THE COMPLETE OUTFIT INCLUDES:

Tuska Combined Tuner and Detector which is so simple in operation that a child can handle it. Telephone Head Set—Our Special 2000-ohm Double Heat Set—reproduces messages loud and clear (see page 15 for complete description).

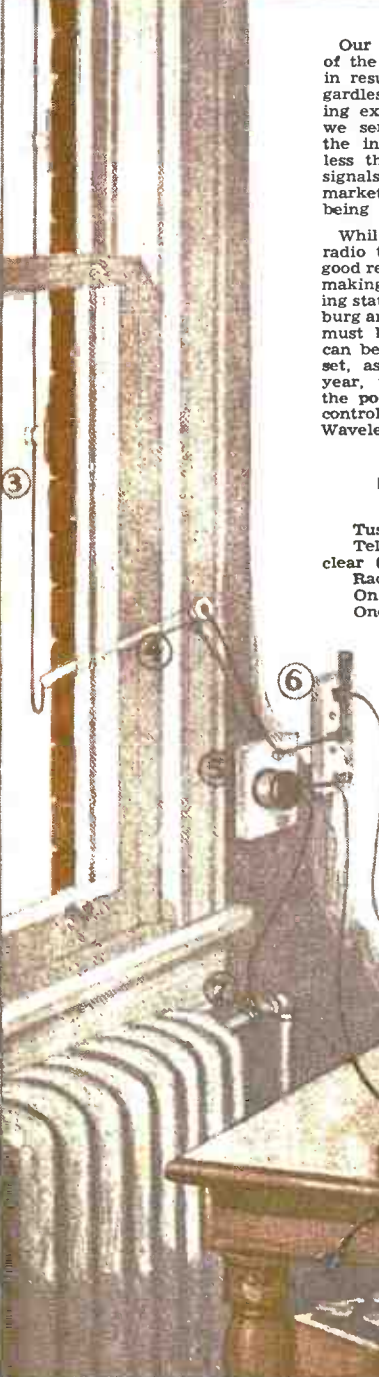
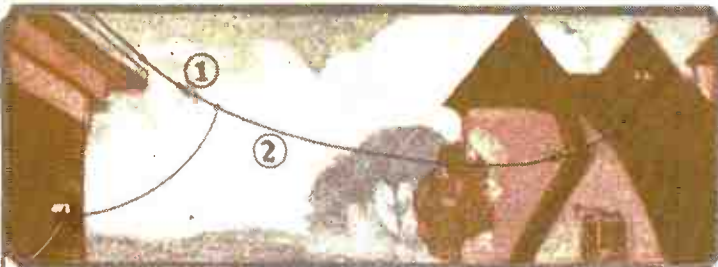
Radio Storage Battery. 6-volt, 40-ampere hour capacity (see page 21 for complete description)

One Detector Tube (see page 16).

One "B" Battery (see page 21).

Antenna Equipment, including 150 feet bare copper wire, 25 feet insulated wire, porcelain base double throw switch, lightning protector, ground clamp, 2 screw eyes and 25 feet of wire for connecting instruments. Shipping weight, complete outfit, 40 pounds.

563 J 639—Complete Outfit. **\$59.50**



Montgomery Ward & Co.
(Satisfaction Guaranteed or Your Money Back)

Chicago Fort Worth
 Kansas City
 Portland, Ore. Saint Paul