Radio
WIRELESS TELEPHONE
WIRELESS TELEGRAPH
EQUIPMENT

Montgomery Ward Ho.
Satisfaction Guaranteed or Your Money Back

Chicago  Fort Worth  Kansas City  Portland, Ore.  Saint Paul

This Catalogue Copyright 1923
Montgomery Ward & Co.
The Airline Special

We are sure you will be pleased with the results you can get with the Airline Special. Comparative tests with many higher priced instruments have shown it to be one of the best sets obtainable today. Try the outfit every day for ten days. If at the end of that time you are not perfectly satisfied with the results, send it back to us and we will return to you the purchase price plus the transportation charges you have paid. Anyone can easily set up this outfit with the aid of the simple instructions we include. These instructions show a picture of each part exactly as it looks with the different wires leading to the proper connections. You have an actual picture of the complete set just as it should be installed. The instructions are clear and simple. Each part is plainly marked and numbered. How to "tune in" is described in such a way that you are assured of successful results the first time. With very little practice you will become expert in handling the outfit. Any member of the family may use the set and be sure of good results.

This receiving outfit will equal in results any 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 instrument, which is easy to do, and in less than 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. This set is capable of receiving radio telephone messages for distances of 50 to 500 miles, depending on conditions.

Chicago  Fort Worth  Kansas City  Portland, Ore., Saint Paul
Complete Directions for Installation and Operation Included

The Tuner and Detector

This is a single circuit type regenerative tuner requiring only very simple adjustments. The tuning circuit is directly connected to the detector and consists of a high grade condenser in series with an inductance having four taps and controlled by a switch lever. This arrangement permits very fine tuning and usually will enable the operator to tune out interfering stations. Regeneration is obtained by means of a tickler coil mounted inside of the antenna in-tonts. Regeneration is obtained by means of a tickler coil mounted inside of the antenna in-tonts. The tuning circuit is directly connected to the tuner requiring only very simple adjustments.

In tests made with this outfit in the vicinity of Chicago, messages and messages being broadcasted from the sending stations in Detroit, Madison, Milwaukee and St. Louis, were heard regularly. Under favorable conditions distant stations—Pittsburgh, Schenectady, Newark, Kansas City and Denver, were heard. We cite these instances to show what has been done with this set. Naturally, these performances cannot be duplicated at all times. The effective receiving range of any set depends on atmospheric conditions, geographical location, the time of the day, season of the year, and the power of the transmitting stations. When conditions are unfavorable, even the most powerful and most sensitive receiving set will have only a very limited range, and under extreme conditions may be incapable of receiving signals entirely for a time. This set is licensed under Armstrong Patent No. 1,113,149 for amateur and experimental use.

The Complete Set Includes

Airline Special Combined Tuner and Detector, which is so simple in operation that a child can handle it. Telephone headset, our special 2,000 ohm double headset, reproduces messages loud and clear (see page 19 for description).

Radio storage battery, 4 volt, 40 ampere (see Page 33 for complete description).

One detector tube (see Page 21). One "B" battery (see Page 33).

Antenna equipment including 150 feet of bare copper wire, 25 feet insulated wire, porcelain base double throw switch, lightning protector, ground plate, two screw-eyes and 24 feet of wire for connecting instruments.

Shipping weight, complete outfit, 40 pounds. $49.50

Iowa "Listens In" On New York with Our Special Airline Receiving Set

Just to see for ourselves what our Complete Receiving Outfit, Number 663-J-639, could do, we took it out to a point on the Mississippi River near Clinton, Iowa. It was a clear night, stringing a temporary aerial up on a country schoolhouse flag pole. Installed the ground wire to the pump, set the receiving instrument on the schoolhouse steps and turned it on. We heard distinctly stations in Schenectady, New York, Detroit, Chicago, Madison, Wisc., Kansas City and Minneapolis.

On another clear night, with our aerial strung up on a windmill, and distant Creek, Michigan, we picked up all the stations heard in Clinton and in addition Atlanta, Ga., the Naval Air Station at Washington, D.C., and another telegraph station along the New England coast.

In tests made during the daytime both in Michigan and Iowa, and from our test station on the roof of our Chicago building, this receiving outfit has picked up messages from stations within a radius of 140 miles. These tests were made with a single tube detector, but similar tests made with a detector and two stage amplifier amplified the messages a hundred times and brought them out so clearly and distinctly that with the aid of a loud speaker they could be heard manly feet from the instrument. These tests were made under ordinary summer weather conditions, with the outfit placed as it comes to you, and under the same conditions as you will use them. With this outfit you can equal, if not surpass, every one of these receiving records.

In spite of the fact that this set costs you less than $25, when tested side by side with much more expensive instruments it has bettered them in results time and again. You will have difficulty in finding another outfit at this price with an equal receiving range.

All merchandise in this catalogue shipped from Northern Illinois.
The Airline De Luxe Radio Receiving Set

Licensed Under Armstrong Patent No. 1,113,149 for Amateur and Experimental Use

For long distance receiving and volume of tone, the Airline De Luxe will equal sets selling at much higher prices. In fact we have tested it against similar outfits sold at nearly double our price and have found the results obtained with the Airline De Luxe actually superior.

A special effort has been 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 an audience can be entertained by the incoming radio program. While designed particularly for radio-phone reception, the outfit is equally effective for radio telegraph reception.

We have carefully tested this set and found it to have an exceptionally wide range. The tests made under varying unfavorable conditions show that the receiving range is at least 150 miles with a transmitting station of ordinary commercial power. Under favorable conditions, stations from 500 to 1,000 miles were brought in regularly. Not only is the receiving range exceptional, but also interferences from other stations is greatly minimized and the frequent atmospheric interferences are likewise reduced. When speaking of the range of a radio set, it must be borne in mind that the range will vary considerably and is influenced by atmospheric conditions, geographical location, season of the year and the power of the transmitting station. Also the range is much greater at night than during the daytime. We feel that this set can be depended upon to receive messages at night over distances varying from 500 to 1,000 miles. However, under unusually unfavorable conditions the receiving range will, of course, be reduced; just as the range of the highest powered commercial receiving stations is likewise affected.

The Complete Set Includes

- Combined Tuner and Detector Two-Stage Amplifier
- One Detector Tube (see Page 21)
- Two Amplifier Tubes (see Page 21)
- One 45-volt "B" Battery with taps for detector circuit tube (see Page 33)
- One 6-volt 40-amperes "A" Storage Battery (see Page 33)
- One high grade 2000-ohm Headset with connecting cord (see Page 19)
- Complete antenna equipment consisting of 150 feet of bare copper wire, 25 feet of insulating wire for connecting to the ground; one single pole, double throw switch; lightning arrester; 4 porcelain insulating knobs with screws; two aerial wire insulators; two screweyes; one porcelain wall tube, and one ground clamp.

Shipping weight, complete, 45 pounds. $89.00

663 J 638—Complete outfit, 45 pounds. $89.00

563 J 646—Tuner and Detector Two-Stage Amplifier, mounted complete in cabinet, but without tubes, headsets, batteries and antenna equipment. Shipping weight, 15 pounds. $55.00

All merchandise in this catalogue shipped from Northern Illinois

Montgomery Ward & Co.
Stay at Home—The Speaker or Musician may be many miles away—Yet you hear perfectly with your Airline DeLuxe

Description and Specifications

The receiving instrument consists of a single tuning circuit built up of a variable condenser in series with an antenna inductance having three taps controlled by a switch lever. Regeneration is obtained by tickler coil, wired in the plate circuit. This feature greatly increases the strength of the incoming signals. From the detector, the current is passed successively through three transformers and two amplifying tubes, until it is increased in volume more than 100 times.

Genuine bakelite panel, 10 1/4 by 15 3/4 inches. Glossy black finish. Tickler coil and variable condenser controlled by two dials mounted on panel. Detector filament current controlled by vernier rheostat, which gives finest control of current and greatly increases the volume of sound obtainable by enabling very close tuning. Amplifier tubes controlled by separate rheostats symmetrically arranged on panel. Tube sockets mounted on genuine bakelite base and fitted with positive contact springs. All connections are made through the rear of the set, entirely eliminating any unsightly wires. Antenna inductance and tickler coil wound with green silk covered wire; 17-plate variable condenser.

Cabinet is made especially for broadcasting—"1-B" batteries. Connection posts plainly marked. A single filament control jack is provided. When a headset or loudspeaker is plugged in, the "A" battery current is turned off automatically. When the plug is removed the "A" battery current is turned on automatically, thereby economizing on the storage battery current. Fine hand rubbed, quarter sawed oak finish. Lightly glossed finish.

This set is licensed under Armstrong Patent No. 1, 113, 149 for amateur and experimental use.

Diagram at the right shows the circuit used in our Airline DeLuxe Receiver. This circuit for receiving broadcasting programs is one of the best known. It is easily controlled and reproduces messages clearly and distinctly. A set embodying this circuit can be easily constructed using the parts listed in this catalogue. However, we are offering this outfit at such an attractive price that little saving could be effected by building the outfit yourself.

Attach a Loud Speaker to Your Airline DeLuxe

Receiving set as listed does not include a loud speaker. Refer to Page 18 for complete descriptions of loud speakers. Any of those shown give satisfactory results with this set. In our tests we have found that when this set is connected up with the sound horn of any good grade phonograph, when using our special loud speaker unit or the Baldwin Type "C" Loud Speaker unit, as described on Page 18, most excellent results were obtained. The concerts broadcast from Chicago, Detroit and Schenectady were brought in very clearly with our Airline DeLuxe Receiver. We found also that this set, when connected to a phonograph, using the regular headset supplied, which was attached by means of our special "tuner," brought in very clear and distinct results. If no phonograph is available, any of the amplifying horns could be used and the tones produced will be very pure and clear. For theatres, large halls and assemblies we recommend a Magnavox. This instrument produces sound in any volume required. When standing close to the Magnavox, the tones are pleasing as those produced by the phonograph, but at a greater distance the reproduction is resilient and satisfactory.

The Entire Family Will Enjoy a Radio Receiving Set

RADIO is the game the whole family can play together. Every evening after evening, Dad with his pipe, Mother with her sewing, old and young, big and little, hovering happily over the "tuner," brothers, sisters, babies, grandparents—every member of the family will gather around the home hearth to enjoy together the entertainment that comes to them with their radio outfit.

Broadcasting stations are now covering the entire country with programs of news, stories, music, lectures, sermons—different every evening—something to interest people of every age. Little folks delight in the stories; middle aged folks sing; dance and play games to the music, while the grownups also enjoy the varied program. The entire family may go to school, to church, or to opera—together, by its own fireside, with radio.

Almost every day ushers in some new form of radio entertainment that will make your outfit even more enjoyable. Your radio set will grow more fascinating every day you own it, and will bring countless new interests and new ideas to every member of the family. Boys and girls will profit by the advantages, and the fun, that a radio outfit brings to them.
Westinghouse "R.C." Radio Receiving Set

The most satisfactory, medium priced, long distance Radio Receiving Set, and at the same time the simplest to operate, is the Westinghouse "R.C." This receiver is manufactured by the Westinghouse Electric & 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 higher priced 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.

Many persons using these outfits in Chicago during the past year have heard the radio programs sent out from New York City. Of course, nearer stations such as Pittsburgh, Kansas City and Minneapolis 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 300 to 500 miles distant, you and your family will be enchanted with the wonders of radio and feel well repaid for your small investment.

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 movement 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 evening 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 are the things mentioned sent out by radio, but market reports, stock reports, sermons, speeches, latest news items and other interesting programs are broadcasted regularly 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:

The Westinghouse "R.C." Set—which is fully described on opposite page. Any other outfit is Double Headset with universal jack plug. (See Page 19. Article Number 63 J 621-complete amateur and experimental use.)

One Baldwin Type C Double Headset with universal jack plug.

One Radio Storage Battery. 6-volt 80-ampere hour capacity. (See Page 19. Article Number 63 J 621-complete amateur and experimental use.)

A complete antenna equipment consisting of:

- 150 feet stranded aerial wire cable.
- 50 feet rubber covered connecting wire.
- 15 feet flexible cord to connect batteries to instruments, etc.

Shipping weight, complete, 50 pounds.

$145.00

All merchandise in this catalogue shipped from Northern Illinois
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
Licensed Under Armstrong Patent
No. 11,113,149 for a tuner and experimental purpose.

This instrument takes the incoming radio wave collected at the antenna wire and "tunes" it so the other apparatus used can change the wave so it may be heard in the head receivers. In order that this "tuning" can be done easily 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 720 meters, which means that amateur, broadcasted and commercial messages may be tuned in. May be used with a crystal or an auditory detector, working alone or in conjunction with an amplifier.

How It Works
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 panel, enables the signal to be heard either by the detector or first or second stage amplifier from far distant stations can be heard very distinctly, either in the telephone headsets or and the current when delivered from this tube has been stepped up so loud and clear that messages at this point already are greatly increased but are further amplified by passing through an other amplifying transformer from which it passes on to an amplification transformer, which steps up the current and delivers it to a vacuum tube detector. The greatly increased sensitivity and selectivity of the set.

Details of Construction
All connections are made at the back of the cabinet. Binding posts extend through the rear of the tuner and are plainly marked by means of insulated insulating plugs. 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, and connected to the ground circuit.

Panel—Micarta, dull satin finish. Cabinet—Height, 9 1/2 inches; width, 6 1/2 inches; depth, 6 1/2 inches. Field mahogany, varnished and polished. Dials—polished black Micarta with beveled edges. Markings filled in black. Condensers—Rotary plate type, air-dielectric. Wiring diagram showing all connections is included, together with complete instructions for installing and operating. Net weight, 6 pounds. Shipping weight, 10 pounds. $56.30 J 622

Follow the Big Games by Radio

Only a few thousand actually will see the games, but millions will sit in grandstand seats in their own homes, and with their radios "tuned in," listen for the good word that Ruth or Hornsby or Walker has "clouted 'em" into the championship.

Last year, for the first time in history, fans miles from the scene of the battle "watched" the game, play by play, as it came to them over the wireless telephone.

This year you who own radio outfits are in the midst of the world of sports no matter where you live. Broadcasting stations all over the country will relay to you the news of the games. Not only baseball, but football, basketball, polo, hockey, golf—all the sporting news is yours first hand.

A radio outfit keeps you "in step"—it gives you a grandstand seat for the biggest sporting events of the season, the country over.

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 wavelength from 1600 to 2800 meters.

It is readily attached to two binding posts at the rear of the cabinet. Ship. wt., 1 lb.

Westinghouse D. A. Director
and Two-Stage Amplifier

This instrument can be used in conjunction with any type of tuner—tuning coupler, honeycomb coils or regenerative tuner. It provides a vacuum tube detector and two stages of audio frequency amplification. The results obtained with its the capacity of the receiver goes up to one hundred times lower than a crystal detector. It is this type of instrument, used in conjunction with a regenerative tuner such as the R. A. set listed above, that makes possible the wonderful results obtained by modern radio. Two such instruments working together have received radio telephone messages from stations 1000 or more miles distant. (See description on opposite page.)

How It Works
The current is first passed to the detector tube, from which 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 greatly increased, but are further modified by passing through another amplifying transformer, from whence the current is delivered to a second amplifying tube, and the current delivered from this tube has been stepped up so loud and clear that messages can be heard very distinctly, either in the telephone headsets or through the loud speaker. Two rheostats—one controlling the detector tube, the other controlling the amplifying transformer—give the operator complete control of the amplified currents. Three telephone jacks are provided for holding any number of telephone headsets. The cabinet is completely shielded in all sides, entirely eliminating capacity effects from operator's body.

Wiring diagram showing all connections is included, together with complete instructions for installing and operating. Net weight, 10 pounds. $56.30 J 624

All merchandise in this catalogue shipped from No
Acme Apparatus

$39.50

Acme Apparatus has made a place for itself in the radio field as being equal to the best merchandise offered. Not only is it of excellent quality, but the radio circuits have been carefully designed and durably constructed. Coupled with these two points, Acme Apparatus is offered by us at very reasonable prices. It represents what we consider the best value of any advertised brands on the market.

Acme Detector and Two-Stage Amplifier

A superior instrument. Consists of an audion detector to which is added two stages of audio frequency amplification. The circuit used is one of the best and insures maximum amplification without distortion and without the objectionable noises and howling. High grade materials are used throughout. The instrument is exceptionally well finished and presents a neat, handsome appearance. Can be used with any ordinary circuit, and is arranged to be directly connected to any regenerative tuner.

Circuit Diagram of the Acme Detector Two-Stage Amplifier

Acme Two-Stage Amplifier

$29.50

This Amplifier is the same as the above Detector Two-Stage Amplifier, except that the Detector unit has been omitted. It is especially designed for connection to any style of Detector unit, whether audion or crystal. It will take the signals as delivered by the Detector unit, and increase them in volume at least 100 times. This Amplifier is designed to give the best possible radio results and will amplify radio telegraph messages without any of the frequently occurring howling and induction noises which are so objectionable.

Description of the Acme Two-Stage Amplifier

Sockets mounted on bakelite base, positive spring connections. Filament current controlled by durable, positive acting rheostats. Acme Audio Frequency Transformers are used. Ample space is provided inside the cabinet for the "B" battery. All connections are made at the rear of the cabinet. Ten binding posts mounted on bakelite strip provide connections for input, "A" and "B" batteries and output. The instrument is arranged to be directly connected to any regenerative tuner or crystal. It will take the signals as delivered by the Detector unit, and increase them in volume at least 100 times. This Amplifier is designed to give the best possible radio results and will amplify radio telegraph messages without any of the frequently occurring howling and induction noises which are so objectionable.

Details

High grade sockets mounted on bakelite base. Positive spring connections. Grid condenser in detector circuit. Rheostats provided for control of filament circuit in finely divided steps. Acme Audio Frequency Transformers are used. Space is provided in the cabinet for "B" batteries. All connections are made at the rear of the cabinet. Ten binding posts mounted on bakelite strip provide connections for input, "A" and "B" batteries. Oil rubbed satin finish, bakelite panel, in brown hand rubbed finish. Base size, 12 1/4 by 9 1/4 inches, height, 10 1/4 inches. Top is attached with two hinges making the interior easily accessible. Filament control is provided so that phone or loud speaker can be connected to either detector, or first or second stage of amplification. These jacks are very desirable as they economize the "A" battery current, the current being drawn only when plug is inserted in jack. Shipping weight, 8 pounds.

$39.50

563 J 643

Acme Two-Stage Amplifier

$29.50

This Amplifier is the same as the above Detector Two-Stage Amplifier, except that the Detector unit has been omitted. It is especially designed for connection to any style of Detector unit, whether audion or crystal. It will take the signals as delivered by the Detector unit, and increase them in volume at least 100 times. This Amplifier is designed to give the best possible radio results and will amplify radio telegraph messages without any of the frequently occurring howling and induction noises which are so objectionable.

Description of the Acme Two-Stage Amplifier

Sockets mounted on bakelite base, positive spring connections. Filament current controlled by durable, positive acting rheostats. Acme Audio Frequency Transformers are used. Ample space is provided inside the cabinet for the "B" battery. All connections are made at the rear. Ten binding posts mounted on bakelite strip provide connection for input, "A" and "B" batteries. Oil rubbed satin finish, bakelite panel, in brown hand rubbed finish. Base size, 12 1/4 by 9 1/4 inches, height, 10 1/4 inches. Top is attached with two hinges making the interior easily accessible. Filament control is provided so that phone or loud speaker can be connected to either detector, or first or second stage of amplification. These jacks are very desirable as they economize the "A" battery current, the current being drawn only when plug is inserted in jack. Elegantly finished, genuine solid mahogany cabinets in oil rubbed satin finish. Base size, 12 1/4 by 9 1/4 inches, height, 10 1/4 inches. Shipping weight, 8 pounds.

$29.50

563 J 644

All materials shipped from Northern Illinois Montgumpy Ward Co.
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 in any part of a room of ordinary size. This special feature makes this an excellent outfit to entertain small audiences in the home, club, church or hall. 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 our Airline 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 may be easily controlled so that the music, speech, etc., comes through the speaking horn loud enough to be distinctly heard by everyone 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 special scientifically designed 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.

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 screw eyes, a porcelain wall tube and a ground clamp. Shipping weight. complete, 45 pounds.

$98.00

ALL MERCHANDISE IN THIS CATALOGUE SHIPPED FROM NORTHERN ILLINOIS
Tuska Expert Tuner—Type 220

Licensed Under Armstrong Patent No. 1,113,149 for Amateur and Experimental Use

A complete super-selective Tuner, designed especially for those who desire the most selective and effective tuning system available. This set is what is known as a three-circuit tuner, and the circuit used is of the regenerative type. All wave lengths from 500 to 900 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 effected instantly by means of the 12-point jack switch, the connections to which are so arranged that there are absolutely no dead ends or capacity losses from the long wave inductances. The hookup 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 mfd., fitted with molded knob and dial; diameter, 3 3/4 inches. Secondary tuning condenser, 13 plate, capacity .00025, fitted with molded knob and dial; diameter 3 3/4 inches. High grade Tuska molded plate varistors for regeneration, fitted with molded knob and dial; diameter 3 3/4 inches. Coupling control, long and short wave change jack switch. Satin finished formica panel, 6 by 17 1/2 inches. Polished nickel finished binding posts plainly marked. Polished mahogany finished cabinet, inside dimensions, 6 by 6 1/4 by 17 1/2 inches. All apparatus is directly mounted on the panel so that all working parts can be removed from the cabinet in one unit. Shipping weight, complete, 18 pounds.

$58.50

563 J 668—Completely assembled with cabinet.

Tuska Standard Receiver—Type 222

Licensed Under Armstrong Patent No. 1,113,149 for Amateur and Experimental Use

This is one of the finest Receivers 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. By adding two stages of audio frequency amplification you have a long distance receiver equal to the best.

Specifications

Cabinet size inside, 6 by 6 1/4 by 17 1/2 inches. Fine polished mahogany finish. Satin finished formica panel, 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 3/4 inches. Small capacity to enable very fine tuning. Antenna inductance with green silk windings wound on molded tube. Fine tape controlled by switch lever. High grade Tuska varistors, molded type with one-piece knob and dial; diameter 3 3/4 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 when panel is removed from cabinet the entire working parts are removed, permitting easy access to every part. Shipping weight, complete, 18 pounds.

$55.00

563 J 660—Wired complete.

All merchandise in this catalogue shipped from Northern Illinois

Montgomery Ward & Co.
Scotland Listens to U. S. with a Paragon

In the late winter of 1922, 200-meter wavelength messages transmitted from Atlantic seaboard towns were picked up in Scotland. With the aid of the two instruments shown below, Paul F. Godley, one of America's leading radio men, while at Ardrossan, Scotland, received messages sent from various amateur stations on the Atlantic coast. Of course, only the very best instruments are capable of such remarkable results, and these tests and many others have proved that Paragon instruments are among the very best.

Paragon Detector Amplifier

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 of the amplifier is at its maximum. It is free from howling and tube noises. May be used in conjunction with any tuner on the market, and is arranged especially for direct connection with regenerative tuners. Grained finish, formica panel 6½ by 10½ inches. Perfect machine engraved lettering, while filled. All metal parts polished nickel finish. Case is of heavy quarter sawed oak in a fine dull, dark rubbed finish. Engraved lettering, white filled. All metal parts polished nickel finish. Grained finish, formica panel 6½ by 10½ inches.

Detector circuit is also provided with an adjustable grid leak. Rheostats and potentiometers are controlled by dial indicators which are superior in operation and appearance to the usual unslightly knobs. Each circuit may be separately connected to the receiver, headset or loud speaker. A special switch controlling switch progressively lights filaments and transfer delicate 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. $62.75

Paragon R.A.-10

Regenerative Tuner

This instrument incorporates the best radio construction. It is made of the finest select materials by experienced, skilled workmen, and the performance of the instrument justifies the claim that it is the finest short wave receiver in the world. Easy to handle even in the hands of inexperienced persons; and in the hands of experts it has broken all records for long distance reception. Greatest efficiency is attained on wave lengths ranging from 360 meters. Will function perfectly over wavelengths ranging from 160 to 10,000 meters. The units are arranged for greatest efficiency and convenience of operation. Absolutely free from body and capacity effects, so that the circuits may be rapidly and easily adjusted.

License Under Armstrong Patent

No. 1, 113, 149 for Amateur and Experimental Use

The instrument is inductively coupled. The primary of the coupler which composes the antenna circuit has two sets of taps, twelve of very fine control and twelve of coarser control. The secondary is controlled by a dial and operates through an arc of 180°. In receivers of this character, adjustment of coupling is delicate. The large area of the secondary makes it easier to obtain these adjustments. The variable condenser is bridged across the coupler secondary. It is recognized that this is the best way to control the grid circuit. High grade varistor with molded stator and rotor form is wired in the plate circuit. A special switch is provided for changing from long to short waves.

Details

Formica panel, 19½ inches long, 6½ inches wide, oil rubbed, grained finish. Engraved lettering filled in with contrasting white enamel. Metal parts polished nickel finish. Dial of polished black molded condenser. Inductances wound on formica tubes. Heavy quarter sawed oak cabinet, live dark rubbed finish. Dial knob filled with afine (vermier) control. Shipping weight, 20 pounds. $72.75

563 J 683

All merchandise in this catalogue shipped from Northern Illinois
Westinghouse Aeriola Sr. Receiving Set

This receiving set 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. These sets used in Chicago during the last season 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 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. Can be quickly set up in any room on a table or sideboard. Make the connections and you can tune in to hear the radiophone programs, music, news items, market reports, stock reports, speeches.

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 ear, 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 wavelength 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 of containing cabinet, 8 1/2 by 7 1/2 by 7 inches.

Complete outfit includes the tuner, as described above; an aeriotron detector tube requiring only one single dry cell for filament circuit; Brandes 2000-ohm telephone headset receivers; American 2 1/2 by 6-inch dry cell; 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, single pole double throw switch, lightning arrester, 4 porcelain insulating knobs with screws, 2 aerial wire insulators, 2 screw eyes, porcelain wall tube, and ground clamp. Shipping weight, complete, 16 pounds.

$65.00

563 J 682—Complete outfit ........................................ $65.00

Two-Stage Amplifier

63 J 649—Westinghouse Type AC Two-Stage Dry Battery Audio Amplifier, for Aeriola Sr. Price includes two tubes. Shipping weight, 5 pounds. $68.00

Aeriotron Detector Tube

The detector tubes supplied with the above outfits 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. Shipping weight, 1 pound.

563 J 5195—Extra Tubes ...................................... $6.50
Short Range Crystal Detector Receiving Sets

The "heart" of these sets, and the part most mysterious in its action, is the "crystal detector"—from which the sets are named. By means of this device, with the help of the tuning coil, the incoming radio waves are changed into such sounds they can be heard plainly. It will receive radio messages from stations as far distant as 10 miles. Under favorable conditions it will receive radio messages from stations as far distant as 25 miles.

The construction of the set is very simple, and with the material supplied it can be put into operation within a few moments. No batteries or source of power is needed, and there are no parts to break or wear out. The set includes a receiving tuner with tapped tuning coil and a 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, 4 porcelain insulators, and a single pole double throw switch.

It is very efficient in design. The tuning is effected by means of a knob and dial mounted on the panel. Detector crystal is enclosed in protecting glass case.

Complete set, 6 pounds.

The Westinghouse Company produced this outfit so that every American home could 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 telephone or telegraph, and radio telegraph its range is considerably more than 10 miles. Under favorable conditions it will receive radio telephone messages as far as 25 miles and radio telegraph messages from stations as far distant as 100 miles or more. The complete set can be installed easily. 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. The tuning is effected by means of a variable inductance controlled by a lever which establishes 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 bare copper aerial wire, 25 feet insulated wire for connecting to the ground, single pole double throw switch, lighting arrester, 4 porcelain insulating knobs with screws, 2 aerial wire insulators, 2 screw eyes, porcelain wall tube and a ground clamp. Connections are simple and easy and the set can be put into operation very quickly. Its effective range is approximately 10 miles. Shipping weight, 4 pounds.

Westinghouse Aeriola Jr.

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Airline Jr. Crystal Receiver

This is a very well made Crystal Receiver Set that will bring in messages over as long a distance as any receiver using a crystal detector. It is very efficient in design. The tuning is done by means of a lever which makes contact on the antenna circuit coil and is controlled by a knob and dial mounted on the panel. Detector crystal is enclosed in protecting glass case. Marked binding post connections for aerial, ground and headset. No batteries or other source of power is needed. This set has an effective range for receiving radiophone messages of about 10 miles. Under favorable conditions it will receive over distances as great as 25 miles.

Mahogany finished cabinet, 6 by 4 by 4 inches. Price is for tuner and detector only. No headset or antenna equipment included. Shipping weight, 2 pounds.

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Reliable Radio Sets and Supplies

In this catalogue is shown the pick of the merchandise to be had in the entire radio field. We have carefully selected reliable instruments and apparatus made by foremost manufacturers. Quality, service and value are the salient points upon which we insisted, and we pass them on to you. Apparatus shown in this catalogue is made by such prominent manufacturers as The Radio Corporation of America, Westinghouse Electrical and Manufacturing Co., The Acme Apparatus Co., C. D. Tuska Co., Adams Morgan Co. (Paragon), and many others equally well known.

All merchandise in this catalogue shipped from Northern Illinois
Short Wave, Long Distance Regenerative Tuner

Solid Mahogany Cabinet
Polished Finish

This instrument makes possible the reception of messages to which other types of apparatus will not respond. The range is from 150 to 425 meters and by the addition of external loaders, such as the inductance coils shown on Page 24, this range may be raised as desired. Properly handled, signals may be received from stations at extreme distances or through heavy static and interference. The antenna and closed circuits are inductively coupled and the coupling 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 quite 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. With an hour's practice anyone can handle these sets as effectively as an expert. Shipping weight, 10 lbs. $29.50

Specifications Short Wave Long Distance Regenerative Tuner

The inductive coupler consists of a primary, the inductance of which is varied by two 7-point switches, and a rotating secondary. By means of this arrangement, very fine tuning is possible. Two variometers tune both grid and plate circuits. High grade dials and knobs fitted to variometers and controls, finely graduated scales in contrasting white enamel. Inductance switch has a smooth working positive contact. Panel, 6V4 by 16 inches, of commercial quality, satin finish, finely machine engraved. Binding posts polished nickel finish. Cabinet solid mahogany, polished finish, 6 inches deep.

Illustration Shows Method of Wiring

The picture to the right 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 which works at maximum efficiency.

Connection and Diagrams of Tuner and Detector

Figure 1

This diagram shows a popular type of Armstrong regenerative circuit. The circuit used in the above regenerative is the same as this. The variable condenser, tube, batteries, etc., are not included in the tuner. This circuit is generally considered as giving the best results of any of the regenerative circuits. The grid and plate are each tuned, are in one continuous circuit and are not affected by the impedance of the receivers, as is the case in some other types of hookup.

Figure 2

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

Connection Diagrams of Tuner and Detector

Two-Stage Amplifier

The illustration above shows how our regenerative tuner and detector and two-stage amplifier can be connected. 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 heard regularly. Very good results are obtained with indoor aerials such as the one shown on Page 34. 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 antenna such as this, can be directed toward the station from which signals are desired, and signals from other stations thus greatly reduced or even entirely eliminated.
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 tuning on the market, but most efficient results are obtained on short wave reception when used in conjunction with any first class three-circuit regenerative tuner. It 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 a receiver headset or loud speaker can be connected in on any of the three circuits. One plug to 4 jacks included. Satin finish bakelite panel. 7¾ 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 "D" battery in detector and amplifier circuits. No tubes, batteries, or phones included. Shipping weight, 10 pounds.

563 J 615 $29.50

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 well designed set, both mechanically and electrically.

How To Order

Before ordering Radio Sets or Supplies from this Catalogue, see Page 30. We have made it easy for our customers to order.

Filling Empty Churches

HUNDREDS of country churches, long pastorless, can now be opened every Sunday, filled with an eager, interested congregation, their influence in the community revived—by Radio.

A radio receiving set and loud speaker "picks up" the entire service from a broadcasting station, or from a church service in some not too far distant city. Songs, in which the congregation joins, choir music, prayers, sermons—the service complete is transmitted by air to these isolated country churches. This is but one of the many uses for radio in the church, to big congregations as well as small ones. Radio brings the music of great choirs, inspiring sermons of nationally known ministers and missionaries, educational lectures, and entertainment of all kinds to church and Sunday School gatherings.

Detector and Amplifier Units

Detector Panel in Cabinet

This unit is so arranged that any type of detector circuit can be used. Satin finish, condenser celeron panel. Pipe finish solid mahogany 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, 8 pounds.

63 J 6354 $6.45

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 wire connections between detector and amplifier. High grade filament control rheostat. Molded tube socket to take any standard tube. Very efficient amplifying transformer. Satin finish condenser celeron panel. Solid mahogany cabinet, finely finished. Produces results equal to the highest grade amplifier units. Shipping weight, 10 pounds.

63 J 6356 $9.80

Detector Unit

This is a very efficient detector unit. Satin finish condenser celeron panel. Pipe finish solid mahogany cabinet. 3°F inches high, 6¾ inches wide, 5½ inches deep. Mounted on wood base. Binding posts arranged for straight wire connections to our detector unit. 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, 3 pounds.

63 J 6350 $4.70

Amplifier Unit

A very effective amplifier, designed for use in connection with the above detector unit. Satin finish condenser celeron panel. Pipe finish solid mahogany cabinet. 3½ inches high, 6¾ inches wide, 5½ inches deep. Mounted on wood base. Binding posts arranged for straight wire connections to the above 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 $8.10

V. T. Control Panel

This is a real utility device, for it may be used either as a detector control, for amplifier control, amplifier condenser, and for the control of power tubes either singly or in groups. The integral condensers in base is insulated and has a beautiful glossy black finish. In the base is mounted a standard V. T. socket, a new, high grade, special design. A 6½ inches, 1 ½ ampere, grid leak condenser of just the right capacity, and nine terminal points which may advantageously be used to connect the unit to any known vacuum tube circuit. Metal fittings are connected nickel plated. Mounting holes of base are very high: base is heatproof. Unit may be used in any position. Outside dimensions, approximately 5 by 5⅝ by 5 inches. Shipping weight, 2 pounds.

63 J 5108 $4.68

Montgomery Ward & Co. All merchandise in this catalogue shipped from Northern Illinois 15
Four Special Knocked Down Receiving Sets

Knocked Down Detector Two-Stage Amplifier

This set contains all the parts necessary to make a high grade detector two-stage amplifier. Materials supplied are of the very best quality and the completed instrument will compare favorably with any other similar instrument on the market. We supply illustrated instructions, telling clearly how to put the set together. The parts can be assembled easily in a few hours, and you will save money by making your own set. What you learn about radio while doing the assembling will greatly increase your pleasure and enjoyment. The instrument when completed can be used with any type of tuner.

The Complete Set Includes:
- Solid mahogany cabinet, polished and hand rubbed finish; condenser cabinet panel 6 by 14 by 3½ inches; ten binding posts with insulated knobs; complete set of name plates to mark binding posts; three molded vacuum tube sockets; three high grade rheostats; three jacks; one plug; two audio frequency amplifying transformers; necessary connecting wire; nuts; screws and washers; complete instructions.

Shipping weight, complete, 8 pounds.

$18.75

Tuska Knocked Down Expert Tuner

Licensed Under Armstrong Patent No. 1,113,149

A complete set of parts to build up a super-selective tuner like that shown on Page 10. Designed especially for those who desire 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 wave lengths from 150 to 600 meters can be covered with maximum efficiency. There are two distinct circuits, one with a range of 150 to 335 meters, the other from 375 to 800 meters. Change from one circuit to the other may be effected instantly by means of the 12-point jack switch, the connections to which are so arranged that there are no dead end or capacity losses from the long wave inductances. The hookup 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 capacity effects from the hands and body of the operator are eliminated entirely.

In a few hours you can assemble these parts easily. Not only will you save money by doing your own assembling, but you also will learn much about radio.

The Complete Set Includes:
- Polished, mahogany finished cabinet, inside dimensions: 6 by 6½ by 17½ inches; satin finished bakelite panel, 6 by 17½ inches; with holes properly placed and drilled so all parts may be fitted easily; 4½ plate variable antenna condenser with molded knob and dial, diameter 3½ inches; variocoupler with molded stator and rotor; variometer molded of polished black composition; short and long wave switch; loading coil wound on form so all connections may be made easily; wire for connections; binding posts; nuts; screws and washers; complete instructions for assembling, installing, operating.

Shipping weight, complete, 18 pounds.

$42.60

Tuska Knocked Down Regenerative Tuner Set

Licensed Under Armstrong Patent No. 1,113,149

for Amateur and Experimental Use

Furnished complete with two variometers, variocoupler, switch lever and contact points, dials, connecting wire, binding posts, and panel 6 inches high and 17½ inches long. All parts can be assembled easily in the proper relative positions to make a solid, high grade instrument. The variometer and variocoupler are the 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. The wave length range is from 150 to 600 meters. Mahogany finished cabinet in polished, hand rubbed finish.

Shipping weight, complete, 10 pounds.

$26.50

All merchandise in this catalogue shipped from Northern Illinois

(continued on next page)
Airline Two-Stage Audio Frequency Amplifier

This instrument can be used in connection with either a crystal or audion detector, to amplify radio signals. It will increase the volume of sound at least 100 times. You do not get the fullest enjoyment from your radio set unless you provide an amplifier. The detector alone will not bring in all of the signals that it is possible for you to get. Add this instrument to your outfit and you will greatly increase your receiving range. Not only this, but by connecting an earphone speaker to your outfit, radio programs can be reproduced loud enough so they can be heard all over your home.

Audiob tube in conjunction with audio frequency amplifiers, comprise the workhorse of the modern radio set. The radio current enters the first transformer, from which it passes through the first audiob tube. From the tube it passes through the second transformer. From the second transformer the current passes through the second audiob tube, and at this point the current is more than 100 times stronger than when it leaves the detector. Because of careful engineering and high grade materials, this instrument is entirely free from howling and other objectionable noises. All working parts are mounted on a panel and can be removed from the cabinet as a unit if desired.

Detector: Mounted on genuine bakelite bases. Positive contact spring connectors at right angles with each other. Controlling rheostate regulate filament current in finely divided steps. Bakelite panel, 7 by 10 inches. Highly efficient audio frequency transformers. Binding post connections for input, output and A and B batteries, all plainly marked. Handsome mahogany finished cabinet, 8 1/4 by 12 by 7 inches. Shipping weight, 6 pounds.

Detector Two-Stage Amplifier Unit

Same as above set, except two stages of amplification added, providing for, in addition to parts specified, two audio frequency transformers, two amplifier tube sockets, two regular filament control rheostats and the necessary additional connecting wire. Panel size, 7 by 16 1/4 inches. Shipping weight, 10 lbs.

Knocked Down Tuner Detector Set

This set contains all the parts needed to make a first class receiving set. Will regularly bring in stations 100 miles or more distant, and under favorable conditions will bring in stations 500 or more miles away. Wavelength range, 150 to 650 meters. In this type: Bakelite panel, 7 by 10 inches, oil rubbed satin finish. Instruments and connections plainly marked with machine engraving in contrasting white enamel. Proper size holes are drilled in panel so all parts can be mounted quickly and securely. Antenna inductance is of green silk covered wire. Three taps for fine tuning; 23-plate variable condenser in antenna circuit permits of very close tuning. Detector socket Vernier control rheostat. All connections can be made at rear of set permitting very neat connections. All connecting wires cut to length and bent so wiring can be done with care. Complete instructions for assembling included. Shipping weight per set, 4 pounds.

Diagram Shows Circuit

The diagram to the right shows circuit used in our Airline Two-Stage Amplifier. This is a very efficient hookup and is the simplest made. The phones are only connected on the second stage which makes for easier construction. You can easily build an instrument of this kind with the parts listed in this catalogue. The cost will be low and the results obtained, if care is exercised in the construction, will be very satisfactory.

Detector Unit

Consists of an audion tube socket mounted on bakellite base, 3 by 3 1/2 inches. To this panel is attached grid condenser and vernier control rheostat, the elements of which are wired together so they are connected easily to the amplifier unit. Sockets are mounted on panel with only two screws. Shipping weight, 3 pounds.

$2.19

Amplifier Unit

Same set equipped with audio frequency amplifying transformer and condenser. Shipped weight, 3 pounds.

$5.89

$16.95

$3.90
The Entire Family Hears the Program with the Loud Speaker

Magnavox Loud Speaker
Substituted for the head-set, the Magnavox enables everything to be heard. You can talk, send messages — music, speech, whatever it may be — amplified in volume so that it can be heard all over any ordinary size room. The volume required for any occasion, without losing even the most delicate tone modulations or single bit of the original clearness. It makes a radio receiver a great home entertainment instrument. It is entirely silent, simply giving the appearance of genuine carved wood. Rich Old Roman gold finish. Designed for use with any loud speaking unit. We recommend either our Special Unit or the Baldwin Type C. No unit is included. Height, 20 inches. Shipping weight, 93 pounds.

Wood Fiber Clear Speaker
This clear tone loud speaker is the result of wood fiber, and reproduces radio messages with the resonance of a seasoned wood sounding chamber. The tones are sweet and clear and are amplified to a remarkable degree. Designed for use with any loud speaking unit. We recommend either our Special Unit or the Baldwin Type C. No unit is included. Height, 20 inches. Shipping weight, 93 pounds.

Notice
Loud speakers will not give satisfactory results unless you use one or more stages of Audio-Frequency Amplification.

Westinghouse Vocorola
Usually several people want to listen in on the radio set at one time. This instrument makes it unnecessary to have a separate head-set for each person, as it reproduces radiophone messages loud enough so that they may be heard distinctly for a distance of 20 feet or more. Consists of a metal amplifier horn to which is adapted a very sensitive loud reproducer. Produces pure, clear tones, without objectionable overtones. Shipping weight, 3 pounds. Shipping weight, 3 pounds.

Federal Pleiophone
Loud Speaker (Improved Model)
Enter the same volume of sound as from an apparatus in conjunction with a loud speaking chamber of special design, which is so designed and adjusted as to reproduce signals, speeches and music, etc., as if it were coming from an apparatus, a loud reproducer connected to a sound amplifying chamber of the instrument presents a handsome appearance. Carefully balanced to reproduce signals, voices and music without distortion. Shipping weight, 3 pounds.

Adaptophone
This device is for use with a single head- or loud speaker unit and will enable you to use the loud reproducer of your phonograph to amplify the loud reproducer of your phonograph. The adapter is made of flexible rubber and the sound will fit the boc of practically any phonograph. Shipping weight, 4 ounces.

Headset Amplifier
Just attach the head-set to the reproducers provided for that purpose and the incoming messages — music, speech, whatever it may be — will be amplified in volume so that they can be heard all over any ordinary size room in the home. The volume required for any occasion, without losing even the most delicate tone modulations or a single bit of the original clearness. It makes a radio receiver a great home entertainment instrument. It is entirely silent, simply giving the appearance of genuine carved wood. Rich Old Roman gold finish. Designed for use with any loud speaking unit. We recommend either our Special Unit or the Baldwin Type C. No unit is included. Height, 20 inches. Shipping weight, 93 pounds.

Deveau Loud Speaker
Radio sets equipped with this instrument in combination with suitable receiving apparatus, will reproduce radio telegraph and radiophone signals capable of being heard in many cases as much as 100 feet from the instrument. Best results are obtained when connected to sets having one or two stages of amplification. Consists of an amplifying reproducer connected to a sound amplifying chamber of special design, which is so designed and adjusted as to reproduce signals, voices and music, etc., as if it were coming from an apparatus, a loud reproducer connected to a sound amplifying chamber of special design. Shipping weight, 3 pounds.

Arkay Loud Speaker
Loud Speaker
With this radio horn you can make your own loud speaker by simply inserting one of the phongs from your head-set in the base. It is so designed as to reproduce signals, speeches and music without distortion, giving a pure and natural tone. Carefully balanced and designed to be used with apparatus, a loud reproducer connected to a sound amplifying chamber of special design, which is so designed and adjusted as to reproduce signals, voices and music, etc., as if it were coming from an apparatus, a loud reproducer connected to a sound amplifying chamber of special design. Shipping weight, 3 pounds.
Our Special High Grade Supersensitive Radio Receiver Headset

This excellent headset is offered at a very reasonable price. Equal in sensitiveness and results to many telephones selling at much higher prices. Light in weight and of substantial, durable construction. Every detail has been worked out carefully and only the best materials are used. The workmanship is the best, resulting in a neat, finely finished set. Army-Navy style headband is shaped to give most comfort. Covered with heavy webbing. Adjustment to fit the head is quick, simple and secure. No chance to pull the hair. Metal receiver shells, polished finish, with polished black molded caps. Five-foot connecting cord with embedded 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 purchase price, together with transportation charges. Shipping weight, per set, 1 lb pounds.

63 J 5171—2000 ohms total resistance. Per set $3.69

Frost Headsets

The product of an old, reliable manufacturer. Has proved very satisfactory under a wide variety of conditions. Very active. Guaranteed high quality and reliable service and satisfaction. Shells made of high quality materials. Well-received headband, easily and quickly adjusted to the head. Shipping weight, per set, 1 lb pounds.

63 J 5160—2000 ohms total resistance. Per set $3.58
63 J 5161—3000 ohms total resistance. Per set $4.27

Brandeis Matched Tone Headsets

These headsets have established themselves as being the best at the price on the market and equal, if not superior, to all receivers at higher prices. They are used throughout the world and are famous for their excellent workmanship, durability and extreme sensitivity. The receivers of each set are very carefully selected, so the low values of the two receivers of each pair are exactly the same, resulting in the message being heard very distinctly. They are styled, comfortably, easily adjusted. Army-Navy type headband with polished black molded caps. Webbing. Will not catch the hair.

63 J 5360—Superior type: 2000 ohms total resistance. Per set $6.85
63 J 5361—Navy type: 3000 ohms total resistance. Per set $12.75

Single Receiver Headsets

A high grade single receiver mounted on a leather covered spring headband. Resistance, 1000 ohms. Especially designed for radio use and very satisfactory where a box priced, sensitive receiver is desired for use in connection with the inexperienced crystal detector receiving sets. Three-foot connecting cord. Weight, per set, 1 lb pounds.

63 J 5363—Per set $2.45

Watch Case Receiver


63 J 5364 $1.05

Vocarola Phonograph Attachment

$18.00

This is probably the most famous radio receiver. Completely different construction than any other on the market. It is fitted with special metals, diaphhones, actuated by a very thin light airframe which is supersensitive to the slightest variation in current passing through the electric magnets. This syphon type of construction enables signals to be heard with great fidelity and extreme sensitivity, not amiable in the ordinary headsets. The high efficiency has enabled it to be used 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 cover with black molded headband, fitted with universal plug to connect to any radio jack. Shipping weight, 1 lb pounds.

63 J 5164 $11.75

Baldwin Type “C” Loud Speaker

Consists of Baldwin Type “C” amplifying type of reproducer. Attached to an ordinary phonograph by means of our 63 J 6299 adapter, when connected to a receiver with two steps of amplification, will produce very fine sound. Complete with 3-foot connecting cord. Shipping weight, 1 lb pounds.

63 J 6367 $5.50

Special Amplifying Unit

Designed especially for use with home-made loud speakers to produce radio messages loud and distinctly, will consist of a non-distortion reproducer fitted with an adapter which can be attached easily to the base of any amplifying chamber. Three-foot connecting cord. Solid metal case, polished finish, spring vibration. Shipping weight, 1 lb pounds.

63 J 5387 $2.95

Receiving Cord

Made of heavy insulated cotton five feet long. For use with any attached double receiver. Shipping weight, 3 ounces.

63 J 5389 $0.75

Airline Long Distance Headsets

Extra fine quality. Made especially for use of the foremost electrical manufacturers in this country and whole world. Will very nearly equal the best results of any headset on the market regardless of cost. They are supersensitive and excellent for long distance receiving. Loud in tone, will stand amplification without distortion. Highly resistant, strong in mechanical construction. Shells are molded mahogany colored, genuine leather finish. Headbands are web covered and easily and comfortably adjusted to the head. Especially designed for use with better grade receiving sets. Shipping weight, per set, 1 lb pounds.

63 J 5165—3000 ohms total resistance. Per set $4.85

Complete with radio plug

11 75
Weatherproof Detector Stand
Very rugged stand. Perfect, easy adjustment. Phosphor bronze contact spring can be set and locked in any position. Made of best grade galena set in Wood's metal mounted inside dust and moisture-proof enameled glass cylinder. All metal parts nickel plated and polished. Formica base, 2 by 2 by ½ inches. A very attractive and efficient piece of apparatus. Shipping weight, 1 pound. $1.38

Standard Galena Detector Stand
Improved Model
A popular detector stand. Tested piece of galena is mounted in cup which can be rotated. Crystal is mounted on brass post with ground wire coiled and pointed and soldered on flat plate. Table is mounted on a metal stand. Shipping weight, 2 ounces. $1.15

Wizard Detector Stand
This detector is an excellent value for the money. Carefully made of highest grade materials. Use any detector mineral. Adjustment can be made to any position. Black polished composition base. Adjustable parts brass, nickel plated. Shipping weight, 4 ounces. 63 J 6535 $89

Broadcast Tested Crystals
Each crystal is carefully tested on broadcast signals. 63 J 5341-Galena mounted 10¢ 63 J 5322-Supersensitive Silicon mounted 15¢

Complete Set of Crystal Detector Parts
Complete set of metal parts to make a high grade crystal detector. Made of brass, nickel finish. No base or crystal included. Shipping weight, per set, 3 ounces. 63 J 6534 $29

Detector Crystals
Genuine Arlington tested minerals, we are told, the best that can be purchased at any price. All are thoroughly tested and guaranteed. Each crystal is carefully tested on broadcast signals. 63 J 5325-Galena 63 J 5322-Supersensitive Silicon $22

Detector Mineral Cup
To hold detector crystal. Made of brass, nickel finish. Holds crystal securely. Easily mounted. Shipping weight, 1 ounce. 63 J 5328 $9

Cat Whisker Wire
Five-foot piece fine phosphor bronze wire for detector cat whisker. Shipping weight, 1 ounce. 63 J 5324 $5

Test Buzzer
Watch case buzzer. Operates on one dry cell. Nickel plated cover and base. Height, 1 inch; diameter, 1 inch. Shipping weight, 8 ounces. 63 J 5345 $64

Century Buzzer
Used by the Army and Navy and commercial wireless stations. For adjusting crystal detectors. Operates on one or two dry cells. Base is hard rubber with black enamelled brass cover. Two thick screws provide for adjustment of the armature to regulate tone to desired pitch. Genuine platinum contacts. Diameter, 2 inches. Shipping weight, 6 ounces. $2.19

Test Buzzer Push Button
For use with test buzzer. Nickel rim with pearl center. Held firmly in ¼ inch hole by small spring clips. Shipping weight, 1 ounce. 63 J 5137 $28

Circular Grid Condenser with Grid Leak
Very convenient form of combined condenser and grid leak. Condenser is mounted between two outside metal plates. Hole in metal base is for grid mounting. Mica insulated, copper conductors. Capacity, .0005 MFD. Leak, 3 megohms. Shipping weight, 3 ounces. 63 J 6535 $49

Telephone Bridging Condenser
Same in appearance and construction as above condenser, but made for bridging across telephone terminal. Designed especially for use in standard regenerative receivers and for highest efficiency at 400 meters. Capacity, .0005 MFD. Shipping weight, 3 ounces. 63 J 6535 $49

Circular Grid Condenser

Variable Grid Leak
This leak is the same size and shape as the above condenser and can be mounted with it, using same screws. It is so arranged that seven different resistances can be obtained, ranging in ¼ megohm steps from ¼ to 1 megohm. Diameter, 1 ½ inches. Shipping weight, 2 ounces. 63 J 6536 $39

Dubilier Micadons-Type 601
These condensers are made by a patented process which gives them characteristics peculiarly adapted to radio needs. They are recognized as being the best articles of their kind obtainable. Strong and durable construction. Permanently accurate capacities without fluctuations. Can be easily connected in parallel to increase capacity or in series to reduce capacity. Shipping weight, each, 3 ounces. 63 J 6538-Capacity, .0001 MFD 63 J 6539-Capacity, .0002 MFD 63 J 6536-Capacity, .0005 MFD 63 J 6535-Capacity, .001 MFD $29

Fixed Receiving Condenser
A necessity on any receiving set. Used as “stopping” condensers or for shunting across telephones. No base or crystal included. Nickel plated binding posts. Shipping weight, 3 ounces. 63 J 5364 $46

Mounted Grid Leak Condenser
Pencil mark type grid leak condenser, mounted between two sheets of bakelite. Connections made through insulated binding posts. Can be fastened to panel or table. Shipping weight, 3 ounces. 63 J 6539 With binding posts... 63 J 6536 Without binding posts... $58

Special Grid Condenser
A well made, rugged condenser made of foil, insulated by paraflin paper and wrapped on a fiber base. Eyeslets at each end of base for easy connection. Shipping weight, each, 2 ounces. 63 J 6533... $14

Variable Grid Leak
A grid leak is necessary in the operation of vacuum tube detectors and some forms of amplifiers to permit the surpluse charge on the grid to discharge. A variable grid leak is most desirable. The base of this grid leak is molded from bakelite and a pencil mark between the contacts provides the variable resistance for leak. Two studs are provided with washers and nuts for panel mounting. Shipping weight each, 3 ounces. 63 J 5341... $19

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 end of the condenser. Very compact. Equal in results to other phone condenser. Shipping weight, 2 ounces. 63 J 6531... $12
The Tubes Through Which Radio Speaks

Cunningham C-300 Vacuum Tube Detector

Makes possible the reception of messages to which the crystal detector will not respond. This tube is made especially for amateur and experimental use. Equally suitable for radio and code signals. The "soft" type, and while especially designed as a detector, they will also give excellent results as audio-frequency amplifiers.

They are remarkably free from tube noise and are supplied with standard 4-prong mounting to any standard type socket. Applied on a plane voltage of 16½ to 22½ volts, filament voltage 5 to 6½ volts. For best results a 4½ battery should be used. We also recommend that a vernier rheostat be used in the filament circuit as a very close adjustment of the filament circuit voltage often is necessary to give the best results.

Shipping weight, 1 pound. $4.58

Westinghouse W. D. 11 Tube

This remarkable tube operates on 1 dry cell as "A" battery doing away with storage batteries. Single dry cell gives long service. It is especially designed and licensed for amateur and experimental use. Equally efficient as detector.

Approximate capacity, .00025 MFD. which is the correct value for the new type detector tubes. Shipping weight, 2 ounces.

Shipping weight, 1 pound. $4.59

Cunningham C-301A Amplifier-Oscillator

These Amplifying Tubes, working in conjunction with amplification transformers, formerly available only at higher prices, are now so manufactured that all types and transformers may be used in a group, although the most successful and the most satisfactory results are obtained when two are used. These tubes are made for use in either type and require no delicate adjustment. They are very pure, having been thoroughly tested from tube to tube. Besides audio-frequency amplification, these tubes can be used as detectors and radio-frequency amplifiers. The normal plate voltage is approximately 40 volts. Although increased amplification can be obtained at plate voltages ranging up to 100 volts, distortion is increased. Fixed filament voltage of 6 to 7½ volts. Pitted with standard 4-prong base.

Shipping weight, 1 pound. $6.50

Radotron UV-200 Detector Tube

Same general specifications as Cunningham C-300 Vacuum Tube Detector. Pitted with standard 4-prong. Applied on a plane voltage of 16½ to 22½ volts, filament voltage 5 to 6½ volts. For best results a 4½ battery should be used. In the plate circuit to enable a voltage potential best suited to the individual tube to be applied, the grid leak is 63 J 5341. We also recommend that a vernier rheostat be used in the filament circuit, as a very close adjustment of the filament circuit often is necessary.

Shipping weight, each, 3 ounces. $1.55

Radotron UV-201 Amplifier Tube

Same general specifications as Cunningham C-301A Vacuum Tube Amplifier-Oscillator. Pitted with standard 4-prong base. The normal plate voltage is approximately 40 volts. Distortion is increased. Increased amplification can be obtained at plate voltages ranging up to 100 volts. Fixed filament voltage of 6 to 7½ volts. Pitted with standard 4-prong base.

Shipping weight, 1 pound. $6.12

W. D. 11 Tube Socket

For panel or table mounting. Arranged so rheostat may be mounted between 0 and 10 at 1 volt steps from 0 volt to 1½ volt. Bakelite construction. Also permits easy change of grid leak or condenser valve. Shipping weight, each, 3 ounces.

Shipping weight, 1 pound. $4.60

Socket Adapter for W. D. 11 Tube

Fits into a standard V.T. socket and makes a convenient method of changing from 6 volt to 1½ volt tubes. Also permits installation of W. D. 11 tubes in sets manufactured to use 6 volt tubes. Bakelite construction. Brass contact pins and springs. High grade adapter. Shipping weight, 6 ounces.

Shipping weight, 1 pound. $5.95

Paragon Potentiometer


Shipping weight, 1 pound. $1.39

Receiving Grid Leaks

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

Shipping weight, 1 pound. $5.95

Tubular Grid and Plate Condensers

These condensers are cartridge shape and the same size as the above grid leaks. They can be mounted, interchangeable, in the grid mountings listed below. A tubular grid leak and a tubular grid condenser mounted side by side in a double or triple mounting, permits easy change of grid leak or condenser valve. Shipping weight, each, 3 ounces.

Shipping weight, 1 pound. $5.15

Grid Leak Mountings

Consists of two spring clips with screw connections mounted on a Bakelite base. The leads are braided and can be readily inserted or removed. Shipping weight, each, 3 ounces.

Shipping weight, 1 pound. $3.85

Variable Grid Leak

A variable grid leak with six fixed values varying in half megohm steps from ½ to 3 megohms. It is especially designed for use with the B. A., W. D. 11, and 201 tube. Each step of resistance has a wire lead which can be attached to a switch point. These balancing and adjusting ranges are controlled by means of a switch lever. Shipping weight, 3 ounces.

Shipping weight, 1 pound. $6.95

All merchandise in this catalogue shipped from Northern Illinois.
Bringing Happiness to “Stay-at-Homes”

Variable Condensers

Table Mounting Type with Glass Case

A high grade variable condenser, properly designed and very carefully built. Both stationary and rotary plates are stamped from sheet metal and are perfectly centering of plates. Gasket, face sheet ends with enamel washers. Regulating dial and pointers. Glass case. Type, 1000 MFD. Weight, each, 3 pounds.

63 J 6481 -4 plate size. Capacity, .001 MFD. $3.24

63 J 6489 -15 plate size. Weight, each, 1 lb. $3.67

63 J 6490 -25 plate size. Capacity, .0005 MFD. Weight, each, 1 lb. $3.98

63 J 6491 -43 plate size. Capacity, .001 MFD. Weight, each, 1 lb. $4.93

Crosley Variable Condenser

This condenser works on an entirely new principle. Has two plates which are turned, and are opened and closed like a book by means of a lever in the lock arrangement. The plates are separated with copper, one copper sheet is reversed with a knife so that the two plates are always held tightly together. Maximum capacity is obtained. Rated at 5000 MFD with 250 volts. Insulated from metal; weight, each, 1 lb. $2.37

63 J 6510

Knocked Down Variable Condensers

A complete set of parts, furnished unassembled. Can be readily put together, and when assembled make a fine class variable condenser. Intended for panel mounting. Same high quality as above condensers. Each inch shaft. Weight, each, 1 lb.

63 J 6512

63 J 6513 -11 plate size. Capacity, .0005 MFD. Weight, each, 1 lb. $1.55

63 J 6514 -23 plate size. Capacity, .00025 MFD. $1.28

63 J 6515 -43 plate size. Capacity, .0005 MFD. Weight, each, 1 lb. $1.95

Precision Type Variable Condensers

These are among the finest variable condensers. Genuine aluminum alloy plates, perfectly flat. The stationary plates are spaced by means of a strong, well made variable condenser and the fine tuning of the single plate vernier. The illustration shows clearly how this is accomplished. Both, W. and C. W. signals this arrangement is ideal. The station may be roughly tuned with the large knob and maximum signal strength obtained with fine adjustments of the small knob. The shipping weight is excellent. Either knob may be turned without disturbing the adjustment of the other. You owe it to yourself and your set to use these condensers throughout. Plates are of heavy, hard aluminum and will not warp. Fixed plates of bakelite. Stationary plates of different weights. $2.95

63 J 6111 -11 plate size. Capacity, .0005 MFD. $2.95

63 J 6112 -22 plate size. Capacity, .00025 MFD. $2.40

63 J 6113 -44 plate size. Capacity, .0001 MFD. $1.00

Advertized Brands Variable Condensers

63 J 5175 -Murdock No. 35. Insulated by bakelite, stationary plates of different weights. $2.95

63 J 5176 -Murdock No. 36. Ship wt., each, 1 lb. $2.37

63 J 5177 -Murdock No. 38. Same as above, except has 12 stationary plates and 1 rotary plate. Capacity, 0000 MFD. Shipping weight, each, 1 lb. $1.79

63 J 6497 -Crosley. Capacity, .0001 MFD. Shipping weight, each, 1 lb. $3.78

63 J 6498 -Crosley. Capacity, .0001 MFD. Shipping weight, each, 1 lb. 42.2

All merchandise in this catalogue shipped from Northern Illinois.
**Molded Bakelite Variometer**

The finest grade variometer. Carefully milled and ground. Scientifically designed for highest efficiency. Rotor and stator forms are of reddish brown molded Bakelite and the shafts are of black polished. Windings are impregnated and securely held in place. Suitable for table or panel mounting. Costing post connections. Wavelength, 150 to 600 meters. 3/4-inch shaft. Shipping weight, 4 pounds. **$5.85**

**Molded Bakelite Vario-coupler**

Designed to match the above variometer in appearance. Form and quality of wire and stator form are of reddish brown molded Bakelite, highly polished. Suitable for table or panel mounting. Wavelength range, 150 to 600 meters. 3/4-inch shaft. Six turns of one turn each, eight of six turns each. Shipping weight, 4 pounds. **$5.85**

**Molded Vario-coupler**

The rotor and stator forms of these variocouplers are molded of a special composition which cannot be scratched or nicked and will retain its shape indefinitely. The windings are molded into the stator form and then slipped into the rotor form in such a way that they can not come loose. The quality of the materials used, this varicoupler produces no scraping contacts. Suitable for table or panel mounting. Wavelength range, 180 to 600 meters. 3/4-inch shaft. Shipping weight, 4 pounds. **$4.45**

**Wood Form Variometer**

We offer this variometer at a very attractive price. While not equal to our special variometer in appearance, it will very nearly equal our high efficiency radio results. Wood forms of kiln dried wood. Rotor windings properly calculated for best results. Positive cable contacts. Binding post connections. Wavelength range, 180 to 600 meters. 3/4-inch shaft. Shipping weight, 3 pounds. **$1.95**

**Our Special Wood Variometer**

This is one of the best values we know of. Especially designed to work with your radio. Made of genuine solid mahogany. Highly polished. Includes all parts for, making a first class radio. No wire included. Shipping weight, 15 pounds. **$3.25**

**Variometer Parts**

Consists of a complete set of parts for making a first class variometer. 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 substitute your own if you desire. Costing post connections. Wavelength range 180 to 600 meters. Genuine solid mahogany. Weight, 1/2 pounds. **$1.35**

**Vario-coupler Parts**

Includes all necessary parts except wire, to make a high grade varicoupler. Secondary is wound on the varicoupler. Primary is wound on an insulating tube and can be tapped at any desired pitch. Costing post connections. Rotor shafts, bearings and connecting screws furnished. No wire included. Shipping weight, 1 pound. **$1.13**

**Does the Man in the Moon Talk to Your Little Folks?**

"ONCE upon a time there was a giant—" "O-o-o," says Little Brother, and he curls up in your lap and forgets to wriggle as he listens to a wondrous fairy tale. For the Man in the Moon is telling Little Brother his bedtime story—by radio.

In homes of homes, when supper is over and the lamps are lit, Little Brothers and Sisters are coaxed into their beds by the same wonderful story that Little Brother hears. The Little Brother in Your House becomes one of these many happy little listeners when you own a radio outfit.

Almost every broadcasting station sends out, as the children's share of the evening's program, bedtime stories which are carefully chosen and charmingly told by people who love and understand children. Little folks from coast to coast have learned to love and look forward to this radio story hour.
All merchandise in this catalogue shipped from Northern Illinois

Improved $17.50 Model

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 it a very smooth acting switch. Has wave range up to 4000 meters and is very effective on short wave lengths, 200 to 600 meters. Formica panels. All components 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. 

Junior Loose Coupler

This Coupler is specially designed to work on wave lengths from 180 to 600 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. Rubber mahogany finished woodwork. Brass parts polished and lacquered. Base size, 12 by 4 3/4 inches. Shipping weight, 6 pounds. 

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. Range up to 4000 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 1/2 inches wide. Shipping weight, 25 pounds. 

Worn Coils

These Coils are used for making tuning coils, loading coils, etc. They are made from specially prepared wood pulp and are treated so that they will hold their shape permanently. Easily cut to any length desired. Sizes given are outside measurements. Shipping weight, 1 pound. 

Cardboard Tubes

These Tubes are used for building up tuning coils. Made of solid brass, smooth, polished finish. Holes drilled in end. Rods are 3/4 inch square. Shipping weight, 6 pounds. 

Wood Parts for Loose Coupler


Two-Slide Radio Tuning Coil


Beginner's Tuning Coil

For the beginner, this is a good working, low priced Coil. It will tune to amateur, broadcasting and commercial stations. Eight inches long. Wood ends, mahogany stained. Enamelled wire. Two brass slider rods with sliders. Shipping weight, 4 pounds. 

Cardboard Tube

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Leading Radio Broadcasting Stations

The central points from which radio telephone or telegraph messages are sent out are called Broadcasting Stations. The accompanying map shows the principal large broadcasting stations in operation today. There are hundreds of others smaller ones, some of them sending out very fine programs. Additional stations are being built constantly, so that within a few months the country will be intensively covered by high powered stations.

Radio messages, like waves on a still pond of water when a stone is dropped into it, travel outward from the broadcasting stations in circles, diminishing in strength the farther out they go. Thus, within a radius of 50 miles of a station the radio waves are very strong, and you need only a simple receiving set to hear them plainly. But the farther you live from a broadcasting station, the weaker are the waves, and the more powerful must be your receiver to get them clearly. Beyond a radius of 200 miles only the more powerful sets ordinarily will pick up messages.

Before ordering your outfit, consult your directory of stations for the nearest one. Figure out how far you live from the station and select the antenna or aerial which will be needed to receive the messages of the station. Of course, not every broadcasting station is listed here; new ones are being erected daily, and only the leading ones have been included. However, you will have no difficulty in finding out whether there is one nearer to your home and how to obtain the directory of stations in your area.

But you should know in mind that radio is very effective, the farther out the station is, the more powerful will be your set to receive messages from it.

Amateur operators may send on 150- and 1,000-meter wavelengths. If a broadcasting station is sending out messages on a wavelength of 360 meters, in order to hear the message, your receiving set must be tuned to pick up 360-meter wavelengths. If it is tuned to a longer or shorter wavelength, you will be unable to hear the broadcasting station.

In order to avoid confusion and keep the best clear from commercial users, the Federal government has reserved certain wavelengths for certain uses. Some of these are:

Wavelengths

Radio waves on these wavelengths come from the broadcasting stations and their call letters.

The Antenna or Aerial

The antenna or aerial is the part of the radio apparatus which collects the radio waves from the air. These waves are conducted to the receiving instrument through a wire called the lead-in.

The Radio Outfit

An Investment

"What, only one show in town today?" says the doorknob to the radio set, "No deal, don't go to it. Who's going to put it on?" says a man with the door and shouts "Hi. Ed, don't load those horn speakers. I'm going to watch you." The other says, "Well, you have a good point. Listen, Ed, why don't you give the other a try?"

The following list gives the leading broadcasting stations and their call letters:

- Station and City
- Call Letters

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Wirkhoff, Ohio

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The Armstrong Super-Regenerative Circuit is one of a line which has proved itself to the ham radio enthusiast. This circuit, whether for use with the Armstrong super-regenerative receiver or with any other receiver, is designed for use with the Armstrong super-regenerative receiver. This circuit may be used with any receiver, whether for use with the Armstrong super-regenerative receiver or with any other receiver. This circuit may be used with any receiver, whether for use with the Armstrong super-regenerative receiver or with any other receiver.

The diagram shows the complete circuit for the Armstrong super-regenerative receiver. The circuit consists of two stages of amplification, with a step-down transformer at the output. The circuit is designed for use with a 10-meter broadcast band, and is capable of receiving signals in the range of 5 to 10 megacycles. The circuit is constructed with standard components and is ready for coupling to an external antenna.

The circuit is designed for operation with a 6-volt battery, and is capable of receiving signals in the range of 5 to 10 megacycles. The circuit is constructed with standard components and is ready for coupling to an external antenna.

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Blueprints of Receiving Sets

These blueprints show in detail how to construct various types of receiving sets. Complete construction detail, of each part required and wiring diagrams of connections.

How to Make 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 unit is especially designed which permits the proper adjustment of the capacity inductance ratio for maximum grid voltage, and eliminates loss in undesired portions of the inductance. Regeneration is provided inductively on the lower wavelengths and capacitively on the longer wavelengths. Shipping weight, per set, 3 pounds.

63 J 6330—Per set of 3 blueprints

$1.80

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

Designed for amateur work to obtain efficiency on wavelengths from 600 to 4000 meters, and giving approximately a regenerative amplification of 100 through the entire wavelength range. Regenerative effects are evident even when receiving C. W. signals. Replaces the two-varimeter tuners. Shipping weight, per set, 4 pounds.

63 J 6332—Per set of 4 blueprints

$2.40

How to Make 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 circuits are employed for maximum regeneration. Shipping weight, per set, 3 pounds.

63 J 6334—Per set of 2 blueprints

$1.20

How to Make Detector and Two-Stage Audio Frequency Amplifier

Designed especially for use with the to 850 and 150 to 3,000 meter Armstrong regenerative receivers, and having all latest advantages. Designed especially for use with the 20 diagrams, 15 by 22 inches. Shipping weight, per set, 3 pounds.

63 J 6336—Per set of 4 blueprints

$2.40

How to Make 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 interference. An additional advantage when using loop antennas is that maximum received energy is obtained from the desired station and 200 meters. Shipping weight, per set, 3 pounds.

63 J 6338—Per set of 3 blueprints

$1.80

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Twenty Radiophone Diagrams

A selection of diagrams and hook-ups which will help you to make up wireless telephone outfits from simplest detector circuit to the most modern regenerative and amplifying set. Consist of twenty blueprints diagrams, 8½ by 11½ inches, and one 4-page direction pamphlet containing illustrated Symbol Key Chart, directions of from these diagrams. How to Follow Charts, key explanation of each diagram.

1—Single Slide Tuning Coil
2—Double Slide Tuning Coil
3—Looper Coupler with Crystal Detector
4—Regenerative Set, using 2-C W. Transmitters
5—Plain Audion Detector Circuits
6—Feed-back Circuit with a Looper Coupler
7—Armstrong Feed-back Circuit
8—Standard Short Wave Receivers
9—Combination Circuit for Long with Crystal Detector
10—Short-Wave Regenerative Set
11—Combination Circuit for Local and Short Wave phone
12—Detector and 2-stage Armstrong
13—Radio Frequency Amplifier
14—Regenerative Receiver
15—Radio and Audion Frequency Amplifiers
16—Circuit of a C. W. Transmitter for low power
17—Circuit of a 400 Meter C. W. Transmitter
18—Radio Frequency Receiver with C. W.
19—High Power C. W. Transmitter
20—Super-Autodyne Receiver

$1.20

Blueprints Showing How to Assemble Armstrong Super-Regenerative Receiver

The Armstrong super-regenerative circuit produces some very exceptional receiving results. The particular circuit selected for these blueprints is the three-type tube, which has proven one of the most satisfactory. Wiring diagrams, panel and interior arrangement are shown clearly. In addition, complete data on construction of loop aerial and coupler are given. A detailed list of materials and tools is included. All construction is illustrated. Shipping weight, per set, 2 pounds.

63 J 6345—Per set of 4 blueprints

$2.40

Blueprints Showing How to Assemble 100 to 3,000 Meter Loop Antenna

Gives data and specifications for construction of loop antennas to receive on wavelengths of 100 to 3,000 meters. Shipping weight, per set, 2 pounds.

63 J 6346

$0.60

Blueprints Showing How to Assemble 1,000 to 25,000 Meter Loop Antenna

Gives data and specifications for construction of loop antennas to receive on wavelengths of 1,000 to 25,000 meters. Shipping weight, per set, 2 pounds.

63 J 6347

$0.60

How to Make a Regenerative Tuner

Complete instructions with drawings on how to make a regenerative tuner for a range of 800 meters. The type of tuner described has a 0.011 cubic inch variable condenser, a tapped induction and a tickler unit. This type of tuner is the most satisfactory. Wiring diagram, panel and interior arrangement are shown clearly. In addition, complete data on construction of loop aerial and coupler are given. A detailed list of materials is included. All construction is illustrated. Shipping weight, per set, 4 ounces.

63 J 6340

$0.40

How to Make Detector and Amplifier Units

Complete instructions with drawings on how to make a detector and amplifier unit for a range of 800 meters. The type of amplifier described has a 0.011 cubic inch variable condenser, a tapped induction and a tickler unit. This type of amplifier is the most satisfactory. Wiring diagram, panel and interior arrangement are shown clearly. In addition, complete data on construction of loop aerial and coupler are given. A detailed list of materials is included. All construction is illustrated. Shipping weight, per set, 4 ounces.

63 J 6341

$0.40

Build Your Own Radio Set

From These Blueprints

BUILD your own Radio Set and you will get a clearer understanding of this wonderful new invention. Think of being able to make, all by yourself, an outfit, that will enable you to listen to lectures, music, opera, concerts—perhaps hundreds of miles away.

The blueprints and instructions offered will show you how to build your own set. They have been carefully planned and drawn up so that you have finished building you will have a Radio Set of the latest design which works as well as the best commercial outfit. And, too, you will have the added satisfaction of knowing that you made it yourself.

All merchandise in this catalogue shipped from Northern Illinois
Leading Radio Broadcasting Stations

The central points from which radio telephone or telegraph messages are sent out are called Broadcasting Stations. The accompanying map shows the principal large broadcasting stations in operation today. There are hundreds of other smaller ones, some of them sending out very fine programs. Additional stations are being built constantly, so that within a few months the country will be intensively covered by high powered stations.

Radio messages are sent out on different wavelengths. If a broadcasting station is sending out messages on a wavelength of 300 meters, in order to hear the message, your receiving set must be tuned to pick up 300 meter wavelengths. If it is tuned to a longer or shorter wavelength, you will be unable to hear your broadcasting station distinctly, if at all.

Wavelengths

Radio messages are sent out on different wavelengths. If a broadcasting station is sending out messages on a wavelength of 300 meters, in order to hear the message, your receiving set must be tuned to pick up 300 meter wavelengths. If it is tuned to a longer or shorter wavelength, you will be unable to hear your broadcasting station distinctly, if at all.

Amateur operators may send on 150 to 200-meter wavelengths; broadcasting stations usually send music or entertainment on 360-meter wavelengths, while market reports are generally sent out on 485-meter wavelengths.

Although amateurs are not allowed to transmit messages on wavelengths longer than 200 meters, they may listen in on any wavelength which their instrument is tuned to a longer wavelength than 200 meters. They may listen in on any wavelength which their instrument is tuned to.

The following list gives the leading broadcasting stations and their call letters.

<table>
<thead>
<tr>
<th>City</th>
<th>Call Letters</th>
</tr>
</thead>
<tbody>
<tr>
<td>East Pittsburgh, Pa.</td>
<td>KDY</td>
</tr>
<tr>
<td>Salt Lake City, Utah</td>
<td>KDY</td>
</tr>
<tr>
<td>San Diego, Calif.</td>
<td>KDF</td>
</tr>
<tr>
<td>Portland, Oregon</td>
<td>KDY</td>
</tr>
<tr>
<td>Great Falls, Mont.</td>
<td>KDF</td>
</tr>
<tr>
<td>Balham Falls, Ore.</td>
<td>KDY</td>
</tr>
<tr>
<td>Phoenix, Arizona</td>
<td>KDY</td>
</tr>
<tr>
<td>Denver, Colo.</td>
<td>KDZ</td>
</tr>
<tr>
<td>Tucson, Arizona</td>
<td>KDZ</td>
</tr>
<tr>
<td>Aberdeen, Wash.</td>
<td>KOB</td>
</tr>
<tr>
<td>State College, N. M.</td>
<td>KOB</td>
</tr>
<tr>
<td>Los Angeles, Calif.</td>
<td>KKO</td>
</tr>
<tr>
<td>San Francisco, Calif.</td>
<td>KPO</td>
</tr>
<tr>
<td>Portland, Ore.</td>
<td>KTO</td>
</tr>
<tr>
<td>Seattle, Wash.</td>
<td>KTO</td>
</tr>
<tr>
<td>Buffalo, N. Y.</td>
<td>KTO</td>
</tr>
<tr>
<td>New Orleans, La.</td>
<td>WAA</td>
</tr>
<tr>
<td>Memphis, Tenn.</td>
<td>WAB</td>
</tr>
<tr>
<td>Wichita, Kans.</td>
<td>WAP</td>
</tr>
<tr>
<td>Greenwhich, Conn.</td>
<td>WAW</td>
</tr>
<tr>
<td>El Dorado, Kansas</td>
<td>WAI</td>
</tr>
<tr>
<td>Bakersfield, Calif.</td>
<td>WAV</td>
</tr>
<tr>
<td>Paso Robles, Calif.</td>
<td>WAV</td>
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<tr>
<td>Davis, Calif.</td>
<td>WAV</td>
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<td>Rockford, Ill.</td>
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<td>Paducah, Ky.</td>
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</tr>
<tr>
<td>Fort Worth, Texas</td>
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<tr>
<td>Fort Worth, Texas</td>
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<td>Fort Worth, Texas</td>
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<tr>
<td>Austin, Texas</td>
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</tr>
<tr>
<td>Houston, Texas</td>
<td>WBF</td>
</tr>
<tr>
<td>New York City, N. Y.</td>
<td>WBA</td>
</tr>
<tr>
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<td>WBA</td>
</tr>
<tr>
<td>Chicago, Ill.</td>
<td>WBU</td>
</tr>
<tr>
<td>Atlanta, Ga.</td>
<td>WTB</td>
</tr>
<tr>
<td>Memphis, Tenn.</td>
<td>WPI</td>
</tr>
<tr>
<td>Detroit, Mich.</td>
<td>WWD</td>
</tr>
</tbody>
</table>

The Radio Outfit An Investment

"Wheat steady; corn down three; sharp break in hogs late today—don’t ship!" Dad drops the radio receiver with a bang, rushes to the door and shouts "Hi, Ed, don’t load those hogs—we’re going to hold ‘em!" Well," says he with a grin as he again takes up the receiver, "that information saved me about $500 in a day.

Many progressive State Universities are sending out this information by radio to farmers. Weather, crop and market reports—facts that are daily vital to the success of the farmers—should be the means of saving them thousands of dollars in a single season. Your State University probably is sending out these reports. If you are not "listening in" on your radio, you are losing valuable information that can save you money.

The original cost of your radio outfit may be more than saved in one season. Dad has been listening to the daily market report on farm produce, broadcasted free by the State Agricultural College.

Weather, crop and market reports—facts that are daily vital to the success of the farmers—should be the means of saving them thousands of dollars in a single season. Your State University probably is sending out these reports. If you are not "listening in" on your radio, you are losing valuable information that can save you money.
It is Estimated
There are Over 300
Broadcasting
Stations in the
United States

Stars Indicate Long-
Range Broadcasting
Stations.

Dots Indicate Stations
of Lower Power.

The Antenna or Aerial

The antenna or aerial is that part of the radio apparatus which collects
the radio waves from the air. These waves are conducted to the receiving
instrument through a wire called the "lead-in."

Single Wire Antenna

Three Wire Antenna

Some of the best results in receiving are obtained with a single wire
antenna 75 to 125 feet long.

This type antenna will receive best when pointed toward the
station from which the signals or speech desired is being sent out.

When properly constructed, the receiving antenna may be used also for trans-
mitting messages. For this purpose an antenna consisting of from three to five
wires from 60 to 85 feet long, is the most suitable. The antenna always should
be clear of all objects and above them if possible. It should also be well in-
sulated from its supports.

If limited space will not permit you
to put up an antenna of 75 feet or more,
construct your antenna with two or
more wires strung parallel and spaced
not less than two feet apart. A wooden
stick can be used to separate the wire.

Indoor Antenna

An outdoor antenna is not abso-
lutely necessary. A four or five
wire antenna, from 35 to 50 feet long,
strung inside the house often gives
very good results. A compact type
of aerial, known as the "loop
antenna," has been very successful
when used with the more sensitive
instruments.

Any of the aerial wire we list
(see Page 34) is satisfactory, but
the seven strand cable, 63 J 5150,
is the best.

Broadcasting stations already have
been perfected to the stage where the
programs they send out are received in
a very realistic way. Much scientific
research work is now being done to
further perfect these stations and, in a
comparatively short time, the quality of
the programs sent out will be very near
to perfection. Your present radio set
will reproduce these perfectly trans-
mitted programs just as they are sent
out. The improvement will be in the
transmission, not in reception, as the
receiving apparatus made today will re-
produce perfectly any radio program.
The Armstrong Super-Regenerative Circuit on which a patent was recently issued to Major Armstrong, marks another step in the progress of radio. This Circuit, while it has not yet been commercialized, supplies, provides a subject for much interesting experiment by the radio enthusiast. It opens up a field of reception quite new in its scope.

With this circuit it is possible to have a set entirely inside of a building, using a loop for the antenna, and receive stations as far distant as 100 miles or more with great volume of sound. Compared to the older circuits the volume of sound obtainable is astounding, as it is possible with the adoption of the circuit shown in Figure 1 to amplify radio signals from 100,000 to 1,000,000 times. Also it is possible to tune so sharply that interfering stations can be tuned out easily. The circuit responds poorly to spark signals such as are used in the usual commercial radio stations, with the result that a set using this circuit can be set up much nearer a commercial station and be almost free from interference from that station.

This circuit is particularly effective on short waves making it especially desirable for receiving the broadcasted musical programs, news items, stock and market reports.

A technical description of this circuit is too lengthy and complicated to give on this page. However, on the opposite page is listed a pamphlet which contains a complete description and gives complete information regarding the necessary apparatus and methods of handling.

The apparatus and material used are the same as have been in use in radio for some time and all the necessary articles will be found listed in this catalogue.

We might say, that the installation and operation of this circuit is rather complicated, but many persons with but limited technical knowledge have built sets that operate very successfully.

Honeycomb Coils

These Two Illustrations Show Honeycomb Coils in Radio Circuits

These two diagrams show Honeycomb Coils used in regenerative circuits. The diagram to the right shows the coils used in an audion detector circuit and shows the schematic wiring. The diagram to the left shows regenerative audion detector circuit with one stage of audio frequency amplification added and the different stages of the way audio frequency can be added.

Learn more about Radio. Read good books on this fascinating subject. See Page 45 for titles and descriptions of the most authoritative Radio Books.
Honeycomb Inductance Coils

Honeycomb coils are used as receiving inductances, in various ways. Because of their compactness, wide range of adaptability and low price, every radio amateur should have a complete set. With them, any style of straight, regenerative, super-regenerative or radio frequency hookup may be made, and results obtained are superior because of the efficiency of the coils and the concentration of the inductances.

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

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 wavelengths without the dead end lessee which may be made, and results obtained are superior.

Each coil, therefore, and its panel support is very conveniently attached to a panel or other support. The nest brackets are of two types—fixed and trunion. The fixed is used where the coil is stationary, and the trunion (Purr) 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 in a separate unit which allows a great variety of arrangements to suit the ideas of the experimenter. For instance, the secondary inductance may be left up and a smaller coil used for coupling, and the secondary loaded by another coil to the proper value. The flexibility of these fixtures may be readily appreciated.

Characteristics and Prices—Honeycomb Wound Inductances

<table>
<thead>
<tr>
<th>Description</th>
<th>Unmounted Coils</th>
<th>Mounted Coils</th>
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<tbody>
<tr>
<td>Article Number</td>
<td>Number of Turns</td>
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<tr>
<td>63 J 6547</td>
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</tr>
<tr>
<td>63 J 6548</td>
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<td>63 J 6570</td>
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</table>

Turney Spider Web Inductance

A new form of inductance. Many may be used on wavelengths 180 - 400 meters. Adaptable to any style of hookup, with any of the crystal or vacuum tube detectors. Special instructions accompany each set, and with the book up given in instructions some remarkable results may be obtained. The three coils, one stationary, two movable—are mounted in wax finish. The flexibility of these fixtures may be readily appreciated. Each binding post mounted on formica strip for easy connection on any type detector.

Shipping weight, 2 pounds. $4.45

Coil Mounting Plug

Used to mount any standard honeycomb type coil. By using tape, string or other suitable material, fiber strips attached to plug can be securely bound to coil. Carefully and accurately made. Shipping weight, 4 ounces. 63 J 6643. 48¢

Fixed Panel Plug

Fitted with brackets to mount on panel or other support. A well made plug, nicely finished. Will give accurate service. Made of molded bakelite. Takes any standard coil plug. Shipping weight, 4 ounces. 63 J 6645. 55¢

Molded Bakelite Movable Coil Mounting

May be swung to any position desired. Used in two, three or three-coil mounting with variable inductance coil with self-capacity handle. Shipping weight, 6 ounces. 63 J 6648. 83¢

Two Coil Mounting

For mounting two standard honeycomb coils of any size. One coil is stationary, the other pivots and is adjusted by knob and shaft and may be locked in any position. Made of sheet bakelite with nickel finished metal parts. For panel mounting. Shipping weight, 2 pounds. 63 J 6538. $3.15

Triple Coil Mounting

For mounting three standard honeycomb coils of any size. Center mounting is stationary, the two outside mountings are pivoted and adjusted by knob and shaft and may be locked in any position. Made of sheet bakelite with nickel finished metal parts. For panel mounting. Shipping weight, 2 pounds. 63 J 6537. $4.28

Resistance and Choke Coils

Fine quality devices carefully and accurately made. Shipping weight, each, 3 ounces. 63 J 6652 — Iron core choke coil 10 millihenries. 98¢ 63 J 6653 — Iron core choke coil, one henry. 1.98 63 J 6654 — Open core choke coil, 10 millihenries. 39¢ 63 J 6655 — Open core choke coil, 5 millihenries. 89¢ 63 J 6656 — Wire wound non-inductive 3000 ohm resistance. $1.42 63 J 6657 — nickel finished non-inductive 4000 ohm resistance. 45¢

The New Armstrong Super-Regenerative Receiver

An illustrated pamphlet showing how to construct and operate this new receiver. A complete and careful detailed explanation of the theory and operation of the one, two and three-circuit, with a list of materials needed. Illustrated with diagrams and photographs. Shipping weight, 4 ounces. 63 J 6658. 39¢
Special Panel Mounting Rheostat


63 J 6402...

Panel Mounting Rheostat


63 J 6402...

Single Knob Vernier Rheostat

Permits vernier adjustment at any point. 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, 1 1/2 amperes. Molding, 1 1/2 pounds. Shipping weight, 1 ounce.

63 J 6407...

Improved Vernier Rheostat

A rheostat which permits of finest vernier control at any degree of resistance of a battery current. The advantage for best results with the modern critical tubes. This rheostat is engineered to give the highest vernier and smoothest adjustment. One of the best designed and best constructed vernier rheostats on the market. Compact, rugged, easily adjustable. Molding, 1 1/2 pounds. Resistance, 6% ohms. Capacity, 1 1/2 amperes. Shipping weight, 4 ounces.

63 J 6409...

Bradleystat Graphite Vernier Rheostat

Gives most even and finest control of filament current. Resistance is controlled by varying pressure on graphite and screw adjustment permits milliamperereadingsup to 10 ma. This rheostat is constructed with, 'an extra hard' graphite resistor, amplifier or 5 watt transistor. Molding, 1/2 pounds. Resistance, 6% ohms. Capacity, 1 1/2 amperes. Shipping weight, 4 ounces.

63 J 6409...

Porcelain Base Rheostat


63 J 5313...

Resistance Wire

A bare resistance wire selected for accuracy and uniformity. For use in electrical measuring instruments, potentiometers, resistance coils, etc. Melting point, 1210° Centigrade (220°F). The current capacity given is for temperature rise of 100° C (212°F) stretched in free air. Prices quoted are for 1-pound spools. Shipping weight, per spool, 6 ounces.

<table>
<thead>
<tr>
<th>Article Number</th>
<th>M.T. &amp; C.</th>
<th>Capacity</th>
<th>Resistance</th>
<th>Per Spool</th>
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<tbody>
<tr>
<td>63 J 6448</td>
<td>10</td>
<td>50 ma</td>
<td>288 ohms</td>
<td>246</td>
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<tr>
<td>63 J 6449</td>
<td>21</td>
<td>80 ma</td>
<td>270 ohms</td>
<td>256</td>
</tr>
<tr>
<td>63 J 6450</td>
<td>14</td>
<td>35 ma</td>
<td>12.4 ohms</td>
<td>48</td>
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</table>

Ampereite Current Adjuster

Vacuum tubes, to operate most efficiently and best the tungsten must have the filament at the proper temperature. To get an ordinary rheostat at Unit the right point, with a varying battery voltage is difficult. Ampereite regulates the current automatically within eight one-hundredths of an ampere of highest point of efficiency and the lowest must have the filament at the proper temperature. It will keep the filament current within eight one-hundredths of an ampere of highest point of efficiency and the lowest must have the filament at the proper temperature. With a detector tube a very sensitive voltmeter is needed to detect any slight decrease in sensitivity. If this condition is not met, the unit is considered defective. Sensitivity, 95.

63 J 6410...

Metal Socket Shell

With this metal shell you can make your own socket. Right size to take any standard tube. Bayonet point groove catch. Well finished. Holes for fastening with screws or rivets. Shipping weight, 3 ounces.

63 J 6422...

Bakelite Socket

Molded all in one piece of bakelite. A strong, compact socket. Takes any standard tube. Positive contact. A fine quality article at a very low price. Shipping weight, 3 1/2 ounces.

63 J 6430...

Best Grade Bakelite Socket


63 J 6432...

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, 6 ounces.

63 J 6419...

Standard V. T. Socket


63 J 6434...

Combination V. T. Socket

Can be mounted directly on panel or recessed in panel. Binding post connections plainly marked. Positive contacts. Easy connections, 18 ohms. Shipping weight, 6 ounces.

63 J 6435...

Combination V. T. Socket


63 J 6434...

Audiol Control Unit

A rheostat and socket combined in one. Very efficiently arranged for panel or table mounting. Socket and rheostat in one unit, molded composition bases. High grade smooth working rheostat. Socket tube polished nickel finish. Plainly marked binding to panel or table mounting. Shipping weight, 3 ounces.

63 J 6417...

Socostat


63 J 6438...

Three-Gang Socket

Three sockets as a single unit. Very convenient for making up detector two-stage amplifier units. Permits a neat, compact job. Binding post connections plainly marked. Shipping weight, 8 ounces.

63 J 6424...

Two-Gang Socket

Two sockets as a single unit. Very convenient for making up detector two-stage amplifier units. Permits a neat, compact job. Binding post connections plainly marked. Shipping weight, 6 ounces.

63 J 6423...

All merchandise in this catalogue shipped from Northern Illinois

Montgomery Ward Co.
Audio Frequency Amplifying Transformer

A well designed, carefully made transformer at an attractive price. Many of these transformers are in use and are giving very satisfactory results. Quality has in no way been sacrificed to cut this unusually low price; we guarantee this transformer to be satisfactory in every respect. Natural ear, binding post connections. Shipping weight, 1 pound.

63 J 6474

$2.70

Audio Frequency Amplifying Transformer

Radio Corp. Model 712

This transformer was designed especially to work with UV-201 and UV-301 tubes. Its characteristics are such that it gives the better amplification with less distortion, and hisses are reduced to a minimum. Windings are encased within the laminated steel core. They are shorted and well-stamped wherever terminal posts are plainly marked. Net weight, 0.5 pounds. Shipping weight, 1 pound.

63 J 6426-Mounted

$4.05

All American Amplifying Transformers

Designed with amplification and internal resistance constants to meet the requirements of Radiotron and similar tubes. Winding ratio of 10 to 1. Essentially constant, of course, to meet the requirements of manufacturers of the higher grade instruments. The mica is perfectly flat and pure.

63 J 6428-Unmounted

1.50

Thordarson Amplifying Transformer

A transformer of special merit, combining uniform construction and distribution that secure superior results with any standard tube. Windings are of large size silk covered wires, giving maximum efficiency without the possibility of burning out. Proper impedance is secured by use of extra large core shell type. Shipping weight is 3/4 to 1. Primary and secondary are wound to give maximum coupling, with low distributed capacity. Housing is practically eliminated. Fully mounted with binding post connections conveniently arranged. Shipping weight, 1 pound.

63 J 6427

$3.65

National Amplifying Transformers

Designed especially for use with Radiotron UV-201 and Cunningham C-301 tubes. Winding ratio, 3/4 to 1. This ratio has been found very satisfactory with these tubes. Shell type gives maximum efficiency. Losses through insulation are very low. Gives maximum amplification without burning, housed in polished aluminum case with binding posts plainly marked. Low in price, but will give equal results to many selling at higher prices.

Shipping weight, each, 1 pound.

63 J 6420-Mounted

$3.70

63 J 6421-Unmounted

2.98

Federal Amplifying Transformer

The original amplifying transformer. Its correct design and careful, perfect workmanship insures the best results in any type of amplification circuit. It is especially compact. Winding ratio, 4 to 1. Amplification is claimed to be 20 times on first step and 100 times on second step. Fully mounted. Shipping weight, 1 pound.

63 J 6429

$5.60

Acme Audio Frequency Amplifying Transformer

A transformer that leads through its merits. Combines uniform tone values and satisfies without handling or distortion. Because of its efficiency it will greatly increase the listening pleasure of any receiving set. Especially desirable for use with loud speaking devices. Easily mounted. Merely binding posts are provided on bottom panel. Guaranteed not to short, or vibrate dangerously even when properly used. Shipping weight, 1 pound.

63 J 6473

$4.38

Radio Frequency Amplifying Transformer

Range of 200 to 5000 meters. The high efficiency of this transformer will step up the strength of the incoming signal to a remarkable degree. By means of a special wiring arrangement, maximum efficiency is obtained from 200 to 5000 meters. As long as wavelengths up to 500 meters, shipping weight, 1 pound.

63 J 6478

$6.50

Radio Frequency Amplifying Transformer

The development of radio frequency amplification will make the new forward the progress of radio. The transformer used will determine very largely the success obtained when using most radio frequency hookups. The transformer we are offering here is the result of a long series of experiments combined with very careful, thorough engineering. It is of the air core type, the windings being in pancake style. This transformer will give very satisfactory results on a wavelength band from 100 to 5000 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. valve 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 antenna. Windings enclosed in sealed case with convenient connections and supports for mounting. Shipping weight, 1 pound.

63 J 6639

$2.95

Coto Coil Radio Frequency Amplifying Coil

Radio frequency amplification hookups are for two purposes, as an improvement of the detector or as increased 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 wave lengths from 150 to 750 meters. They can be mounted in tandem with a single control for all stages. Shipping weight, 10 ounces.

63 J 6637

$4.95

Acme Radio Frequency Transformers

These transformers are used where a longer receiving range is desired or for use with transformers in a secondary circuit. They were developed by a staff of the best engineers in the country and the result is the most advanced development in radio frequency transformers. Wiring diagrams supplied with each transformer. From core type. Mounted in kuleite cases. Shipping weight, each, 1 pound.

63 J 6425—First stage transformer. Wavelength range, 100 to 500 meters. 500 meters for amateur reception.

$4.38

63 J 6426—First stage transformer. Wavelength range, 250 to 3000 meters. 5000 meters for amateur reception.

$4.38

63 J 6427—Second stage transformer. Wavelength range, 250 to 400 meters.

$4.38

This diagram shows a satisfactory method of connecting our transformer, 63 J 6650, using two stages of radio frequency detector and one stage of audio frequency. Experience has proved that this hard tube gives results with this circuit that is not equaled by any single stage of amplification. Our detector tube as the detector. The set made up as shown on this diagram includes one step of radio frequency amplification, a detector and two stages of audio frequency amplification. This ratio of 10 to 1. Amplification in every respect.

63 J 6474

$4.38

Montgomery Ward & Co.

All merchandise in this catalogue shipped from Northern Illinois.
Electric Drill

Will save you much time and labor in your ex-

periments. It drills quickly clean cut holes in

panels of any ma-

terial. Will drill drills up to 1/4 inch in diameter,

which is large enough for all ordi-
nary a job work.

Fast working;

High speed

Switch in handle to turn current

on and off. Works on any house lighting current from 105 to 120 volts, either direct or alternating.

Weight only 12 ounces. Polished and varnished.

$23.75 63 J 5825

Gasoline or Kerosene Blow Torch

Produces 400 degrees more heat than ordi-
nary torch. Special design of burner of new

composition bronze has no holes, since is and is not affected by wind—may be used in-doors or out. Produces a steady blue flame of

intense heat with low fuel consumption.

Tank made of extra heavy stainless drawn brass.

Bottom shaped to form funnel. Recommended for linemen, radio experts, mechanics, plumbers and any one who needs a high grade torch.

Complete with soldering copper holder. Height, 7 and 9 inches. Shipping weight, 3 and 4 pounds.

84 J 5219-1/4 inch. 3.60

84 J 5221-1/2 inch. 4.15

Insulating Tape

For wrapping wires where insulation has been scrued off. In making joints on electric wires they must first be soldered, then wrapped with rubber splicing compound over which friction tape is wound. Shipping weight, per package, 1 pound.

63 J 5846-Black Tape, 1/4 inch wide. A high grade tape. Half-package 22¢

63 J 5854-Rubber Splicing Compound, 1/4 inch wide. One of the best rubber splicing compounds on the market. Half-package 24¢

Side Cutting Pliers

Forged from the best quality steel. Recommended for linemen, radio experts, mechanics, plumbers and any one who needs a high grade torch.

Complete with soldering copper holder. Shipping weight, per set, 1 pound.

84 J 5234-Set, 114 inches. 7.95

Electricians' Pliers

High grade, 51/2 inch. hardened steel pliers with sharp nose. Used extensively in heavy electrical work. Handy around any workshop.

Ship wt., 6 oz.

84 J 2168

Radio Tap and Die Set

Standard sizes for radio instruments. Set includes one each, plug tap and round nuttable die of all dissimilar sizes, %, %, %, %, %, %, together with a 5/8-inch long stock to hold dies and a 5/8-inch long tap wrench. Shipping weight, per set, 2 pounds.

84 J 7418-Per set. 9.98

Screw Driver Set

This set of screw drivers with blades %, %, % and % inch is particularly well suited for fine electrical work. Handiest of all screw driver sets.

84 J 9760-Per set. 9.95

Radio Drill Set

Set of six drills wire gauge sizes number 10, 15, 20, 25, 32, 41. 60 J 7810-Per set. 1 pound.

84 J 1093-Per set.

Hand Drill

Good-Patt hand drill, style %.

One of the finest produced. Bearings are of No. 15 hardened steel. Double gears, two speeds.

Shipping weight, 3 pounds.

64 J 1298

Automatic Blow Torch

With this blow torch you can make neat, clean joints easily and quickly. Solder both cylinders with denatured alcohol, light the large cylinder and in a few seconds a force is automatically generated which will produce a long, needlelike flame. This flame can be directed to the joint to be soldered and the heat con-

fined to a very small space. Material parts of brass, polished nickel finish, % inch high, 2 inches wide; cylinders, 1/4 inch diameter. Shipping weight, 6 ounces.

63 J 5676

Super Blow Torch

A handy, power packed torch. Is clean, compact, neat and efficient. Gives instant, intensive and noiseless flame. Fill cylinder with gasoline and light. The blow torch and torch is ready for immediate use and can be pointed for economical burning. Burns fourteen minutes with one filling. Shipping weight, 3 pounds.

63 J 5677

Baby Gasoline Torch

For Difficult Work in Tight Spaces

The smallest practical Torch made. Lights with a match. Perfect and powerful. Burns without air pressure. Simple and automatic, with no movable parts, valves or pump to get out of order or be replaced. Tank weight, inch; diameter, inch. Requires no pumping. Need always be ready for use; simply hold a lighted match to the burner and it lights quickly. Will burn steadily for one hour on one filling. Gasoline. Shipping weight, 8 ounces.

63 J 5678

Soldering Set

A complete set for doing all ordinary small soldering. Consists of large size and a small spool of solder, bar of solder, powder and a high grade blow torch. Suitable for electrical work by any Radio Dealer for 1% pounds.

63 J 5844-Per set. 1.32

Electric Soldering Iron

An electric heated soldering iron. Attach- it to any 105 to 120 volt house lighting socket, turn on the current and in two to three minutes iron will heat to proper temper- ature and maintain its heat suitably for general household soldering any radio connection. Used on coper with 6-foot cord and 6-foot coper. Shipping weight, 2 pounds.

63 J 5873

Combination Etcher and Soldering Iron

A complete soldering set, consisting of self heating soldering iron, solder, flux and marking iron. Mix paper supplied in silver, gold, green and red for marking the circuit. Soldering point included for soldering any radio connection. Shipping weight, 2 pounds. Complete with 6-foot cord and attaching plug. Shipping weight, 2 pounds.

$5.85

Radio Soldering Outfit

A complete set consisting of self heating soldering iron, 120 volt house lighting socket, tank, rubber tube. Denatured alcohol is used for flux and soldering iron. Complete with 6-foot cord and coper. Shipping weight, 2 pounds. Complete with 6-foot cord and 6-foot coper.

$4.85

makes a Soldered Joint with Heat of a Match

The iron heated for about twenty minutes. The iron is used on the soldering point and the soldering flux. Denatured alcohol is used for flux. Shipping weight, 2 ounces. Complete with coper and flux. Complete with 6-foot cord and 6-foot coper.

$1.78

Wire Solder

63 J 5830—Resin core Wire Solder. Requires no flux. Indispensible for soldering electrical connections and extensively used on telephone and radio work. Complete with 6-foot cord and 6-foot coper. Shipping weight, 2 ounces.

63 J 5831—Acid Core Wire Solder. Especially adaptable for telephone connections. Complete with 6-foot cord and 6-foot coper. Shipping weight, 2 ounces.


$1.97

All merchandise in this catalogue shipped from Northern Illinois

Montgomery Ward & Co.
Storage "A" Batteries

Ten Days' Trial in Your Own Home

When we entered the radio field, one of the first things we did was to get in contact with a manufacturer who could make a high grade Storage Battery for radio purposes. Our efforts were unusually successful. Not only are we offering a battery of the very best quality, but also our prices are right. They are lower than those asked for many "A" batteries of inferior value. You need not hesitate to order from us, for you don't risk a cent. Try the battery for ten days in your own home. If it does not prove entirely satisfactory, write us for shipping instructions, and the purchase price, plus transportation charges, will be refunded promptly.

We offer only full size, honestly rated batteries that will deliver rated capacity and more. They are made of select new materials. We positively do not sell re-built batteries.

These batteries are especially designed to meet all conditions of radio. The plates are extra heavy, thus the battery will hold its charge for a long period of time. The full 24 volts, or taps of two-volt variation, may be sealed to insure a dry, clean exterior. The battery is shipped to you fully charged, but with the electrodes, terminal leads, and all other parts, except the case, rubber covered and provided with all brass wire connectors so that connection wires will not be affected by acid fumes. Rubber covered wire terminal leads with all brass wire connectors are provided so that connection wires will not be affected by acid fumes.

Our efforts were unusually successful. Not only are we offering a battery of the very best quality, but also our prices are right. They are lower than those asked for many "A" batteries of inferior value. You need not hesitate to order from us, for you don't risk a cent.

Try the battery for ten day's in your own home. If it does not prove entirely satisfactory, write us for shipping instructions, and the purchase price, plus transportation charges, will be refunded promptly.

We offer only full size, honestly rated batteries that will deliver rated capacity and more. They are made of select new materials. We positively do not sell re-built batteries.

These batteries are especially designed to meet all conditions of radio. The plates are extra heavy, thus the battery will hold its charge for a long period of time. The full 24 volts, or taps of two-volt variation, may be sealed to insure a dry, clean exterior.

The case is made of fine, hard maple with dovetailed corners. The plates are extra heavy so the battery will hold its charge for a long period of time and can be stored without harm. Rubber covered wire terminal leads with all brass wire connectors are provided so that connection wires will not be affected by acid fumes.

Rubber covered wire terminal leads with all brass wire connectors are provided so that connection wires will not be affected by acid fumes. These batteries are especially designed to meet all conditions of radio.

The voltage will not vary perceptibly over a period of several hours use. Also a storage battery is considered comparatively free from the many internal noises which are objectionable in the dry cell "B" battery. This is a 12-cell battery put up in a compact unit rubber case, which is carefully sealed to insure a dry, clean exterior. Retailers charges for the same period of time. The full 24 volts, or taps of two-volt variation, may be sealed to insure a dry, clean exterior.

The battery is shipped to you fully charged, but with the electrode, terminal leads, and all other parts, except the case, rubber covered and provided with all brass wire connectors so that connection wires will not be affected by acid fumes. Rubber covered wire terminal leads with all brass wire connectors are provided so that connection wires will not be affected by acid fumes. These batteries are especially designed to meet all conditions of radio.

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Indoor Loop Antenna

This design was made to meet the requirements of persons desiring to receive radio messages without the use of an outside aerial wire. Some circuits and installations use indoor antennas for the aerial wire, under favorable conditions, but receiving stations several hundred miles distant. A specially modified antenna for this purpose has been in use for a number of years, and different forms of it have been used successfully. Interference can be practically eliminated. It can also be used for direct connection. Connected to a tuned circuit, the antenna can be used to receive radio messages over long distances, although stations more than a hundred miles distant have been tuned in with sensitive sets. Very efficient on 200 to 600 meter waves. Can be installed in spaces from 6 to 10 feet wide. Shipping weight, 5 pounds.

63 J 651 $4.35

Helix Antenna

A new device to be used in place of straight wire antenna. It can be put in a small space inside a room, or on the outside of a window, where space is limited. Especially effective in localities where antennas are not desirable. It is a very efficient unit for receiving from nearby stations. Also useful as an emergency antenna. In congested localities loops are especially desirable, as it is possible to receive on most interfering stations. Shipping weight, 6 ounces.

63 J 653 $5.10

Box Type Loop Antenna

Dissers from the one shown to the left in that this instrument is designed for the receiver. This type loop has given excellent results when used with circuits containing inductance and capacitance. It is not recommended for direct connections. Can be easily assembled and taken down. Complete with frame and stand. Some of the new radio and binding post connections. Size of loop is 2 feet on each side. Modern radio frequency circuits and the super-regenerative type circuits have opened up a very broad field for indoor loop antennas. Over distances of from 200 to 300 miles is common, and many long distance results have been reported. This loop has given very efficient results, and is quite satisfactory in most interfering stations. Shipping weight, 6 ounces.

63 J 6605 $1.19

Copper Antenna Wire

Supplied only in sizes listed. All sizes are made of stranded hard drawn copper wire, high tension strength. Large area, giving low resistance and better results. Price per foot, per size, 6 cents. Shipping weight, 2 ounces per 100 feet.

100 feet, 69c, $1.36, 500 feet, $3.25

63 J 5151 BARE COPPER WIRE NO. 14 GAUGE 500 FEET 1.70

63 J 5152 BARE COPPER WIRE NO. 12 GAUGE 500 FEET 2.65

Copper Tinned Wire Antenna

The ideal wire for radio aerials. 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, 6 ounces. $1.38

63 J 6248

New Code Rubber Covered Wire

Solid copper tinned wire, insulated with rubber composition over which is cotton saturated braid. Shipping weight, per 100 feet, 3 cents. Shipping weight, 72 ounces per 100 feet.

63 J 3015 SIZE 14 25 FEET $ .25

63 J 3036 SIZE 4 25 FEET $1.42 100 FEET 5.25

Two conductor, twisted New Code lamp cord. Insulation consists of fine copper wire strands twisted together and insulated with rubber composition. Made of high quality insulation. Price per foot, 25 cents. Shipping weight, per 100 feet, 2.5 pounds.

63 J 3180 10 FEET $ .14 25 FEET $ .39 100 FEET $ 1.70

63 J 3185 10 FEET $ .14 25 FEET $ .39 100 FEET $ 1.70

Antenna Wire Connector Block

If you have an antenna of more than one wire, you should connect the wires together with this connector block. Does away with soldering and loose connections. Made of solid brass. Easy to Install. Shipping weight, per 5 ounces.

63 J 6604 $3.25

Ground Clamp

If you ground your outfit on a water pipe or steam pipe, you should use a ground clamp to prevent leakage of radio currents. Approved by Fire Underwriters. Shipping weight, 7 lbs. $2.85

63 J 6602 $2.15

Electric Light Socket Antenna

Screw this device into any electric light socket and you can use it to replace the usual outdoor aerial. It is best for receiving from nearby stations and is not recommended for long distance reception. Complete with all necessary parts and wiring. Size of loop is 2 feet on each side. Soldered connections. Size No. 14. Shipping weight, 5 pounds.

63 J 6605 $1.19

Lightning Arrester

If you should neglect to throw your aerial switch to the ground contact when not using your instruments and an electrical shock 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, 1 lb 1 oz. $7.25

63 J 6608

Brach Outdoor Type Vacuum Arrester

This arrester is built for outdoor service and is arranged so that it can be hung on the antenna or lead-in wire. It is fitted with a matching lug and binding post. The safety gap points of this arrester are set so as to prevent leakage of radio currents. Approved by Fire Underwriters. Shipping weight, 8 ounces. $2.28

63 J 6607

Outdoor Type Porcelain Enclosed Lightning Arrester

The safety gap points of this arrester are set so close together inside a porcelain protective cover that it can be depended upon to prevent current from passing to the ground. These arresters can be suspended from lead wire or fastened to any support. Shipping weight, 2 pounds. $1.58

63 J 6611

Brach Indoor Type Vacuum Arrester

This arrester must be mounted so that it is protected from inflammable materials. Approved by Fire Underwriters. Will not permit leakage of radio currents. Shipping weight, 6 ounces. $1.90

63 J 6609

Pipe Cap and Point

These two fittings may be attached to any galvanized iron pipe 3-inch iron pipe size. Pipe should be large enough to support and ground to insure good ground connection. Screw connection on cap for fastening ground wire. Shipping weight, per set, 2 pounds. 76c

63 J 6244

All merchandise in this catalogue shipped from Northern Illinois

Montgomery Ward & Co.
Especially Designed 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 rubber is used to make the body of the insulator. No shellac is used. Has a high melting point (360°F) and is very high in resistance to acids, water or any ordinary atmospheric conditions. A particular feature of these insulators is that, with 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 of the weather.

**Insulator for Small Aerial**

- Flash over voltage: 25,000 volts
- Shipping weight: 4 ounces
- 63 J 6610 - Each: 6¢

**Round Insulator with Loops**

- A new style of round insulator with metal loops for holding wire
- Flash over voltage: 25,000 volts
- Shipping weight: 4 ounces
- 63 J 6610 - Each: 6¢

**Popular Size Insulator**

- Length: 2 inches, under shoulder, 1½ inches
- Flash over voltage: 25,000 volts
- Shipping weight: 4 ounces
- 63 J 6614 - Each: 8¢

**Air Gap Type Insulators**

- Lead-in Bushing-Panel Insulator
  - Flash over voltage: 25,000 volts
  - Shipping weight: 1½ pounds
  - 63 J 6620 - Each: 20¢

**Aerial for C. W. Transmission**

- Length: 10 inches
- Tensile strength: 1,200 pounds
- Flash over voltage: 25,000 volts
- Shipping weight: 2½ pounds
- 63 J 6624 - Each: 20¢

**Post Type Insulator**

- Used for supporting wires or other live conductors
- Threaded inserts in top and bottom fitted with machine screws and washers
- Metal parts tightly fitted and will not come loose from brilliant brassing.
- Flash over voltage: 25,000 volts
- Shipping weight: 8 ounces
- 63 J 6626 - Height: 1½ inches, Diameter of base: 1½ inches, at top: 1 inch, shipping weight: 8½ ounces: 48¢
- 63 J 6628 - Height: 1½ inches, Diameter of base: 1½ inches, at top: 1 inch, shipping weight: 1 pound: 76¢
- 63 J 6630 - Height: 1½ inches, Diameter of base: 1 inch, at top: 1 inch, shipping weight: 2¼ pounds: $1.20

**Lead-in Bushing—Panel Insulator**

- Especially designed for panel work
- Length: 2 inches
- Flash over voltage: 25,000 volts
- Shipping weight: 2½ pounds
- 63 J 6632 - Each: 17¢

**Window Sash Insulator**

- For bringing lead wires through window sash or wall
- Flash over voltage: 25,000 volts
- Shipping weight: 4 pounds
- 63 J 6638 - Each: $1.35

**Wall Insulator**

- Especially designed for bringing insulators for bringing in wires from the outside. Can be attached to any wall not over 12 inches thick. Length: 5 inches, under shoulder: 5 inches, above shoulder, 5½ inches, has ½-inch hole in center from end to end. Shipping weight: 6 pounds
- 63 J 6640 - Each: 34¢

**Reliable Electrode Insulators**

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

**Porcelain Strain Insulators**

- A well made finished porcelain insulator, strong and durable
- Shipping weight: 4 and 8 ounces
- 63 J 6644 - For 4-inch walls or smaller: 49¢
- 63 J 6645 - For 6-inch walls or smaller: 89¢

**Porcelain Brackets**

- These brackets are used for attaching aerial or ground wires to buildings or poles
- Per dozen: 45¢

**Porcelain Tubes**

- Unglazed porcelain tubes, ½ inch inside
- Per dozen: 10¢

**Glazed Porcelain Cleats**

- Tubs No. 10 or smaller insulated wires
- 63 J 3906 - Length: 6 inches, Per dozen: 12¢
- 63 J 3908 - Length: 8 inches, Per dozen: 20¢

**Standard Type Stepdown Transformer**

- Transforms 110-volt 60-cycle alternating current down to lower voltage. Whiffles sealed into steel cases. Connection post for different voltages. Fitted with 7 feet of cord and attaching plug
- 63 J 1695 - 80-watt capacity produced 380 volts in steps of ½ volt each. Shipping weight: 10 pounds: $2.58
- 63 J 1697 - 100-watt capacity produces 100 volts in steps of ½ volt each. Shipping weight: 10 pounds: $3.70
- 63 J 1699 - 150-watt capacity produces 150 volts in steps of ½ volt each. Shipping weight: 13 pounds: $5.95

**Radio Information**

- See Pages 48 and 49 for general information on radio which will be of much interest to you.

All merchandise in this catalogue shipped from Northern Illinois
Build Your Set with Uniform Parts

All the items shown here have nearly shaped ten sided knobs, molded of composition, with a highly polished black finish. Made on a pattern that will greatly improve the looks of your set.

These articles are carefully designed and made of the best obtainable materials to give long and satisfactory service.

One-Piece Dials with Knobs
Scale, 0 to 100. Diameter, 3 3/4 and 4 Inches

One-Piece Dials and Knobs
Scale, 0 to 10. Diameter, 2 1/4 Inches

Series Parallel Switch
Well-Made—Nicely Finished

Dead End Switch
 Used for dead ending unused portions of coils which produce greater efficiency. Four polished nickel finished arms are attached to bakelite strip. There is no metal, nor is there any moldings. Can be mounted on panels up to 1/4 inch in any direction. Shipping weight, 4 ounces. 49c

High Grade Switch Lever
Matches our uniform parts. Ten sided, molded knob, polished black finish. Positive contact, smooth working. Shipping weight, 6 ounces. 63 J 6753

Binding Posts
Large size, ten sided, molded bakelite knob, polished black finish; metal barrel, polished nickel finish; 3/4-Inch long; 3/4 screw with washer. Finishes off panel when using other items in this set. Shipping weight, per dozen, 8 ounces. 97c

Bakelite Knobs
Ten sided, molded bakelite, polished black finish. Base, 1/4 inch; 3/4 inch high; shaft hole in center of bottom. Fitted with set screw. Shipping weight, each, 2 ounces. 18c

Vernier Rheostat
Used to regulate filament current to detector or amplifier tube. Heat-resisting base; molded ten sided knob, polished black finish; phosphor bronze contact. Made of brass with silver plated characters and polished black finish; phosphor bronze contact. Base, 1 1/2 inch; height, 3 1/2 inch high; shaft hole In center of bottom. accents, 200 ohms. Machine easily and will not warp nor absorb moisture. Supplied in handsome, natural wood cabinets. Shipped weight, 8 pounds. 63 J 6758

Potentiometer
Gives accurate, smooth, fine control. Mounts on panel up to 1/4 inch thick. Heat-resisting base; molded, ten sided knob, polished black finish. Resistance, 5 ohms. Each, 63 J 6751 $1.22

Radio Panels

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 required and will not warp nor absorb moisture. Supplied in handsome, natural polished black finish, which may be sandblasted and all rubbed together to produce a velvet satin finish. Shipping weights: 2 to 8 pounds. 63 J 6757

Radio Panel Plates

These panel plates will identity every connection. Made of brass with silver plated characters and "On" and "Off" which are 1/4 by 1/4 inch, the increase current and "On" which are 1/4 by 1/4 inch, and the decrease current and "On" which are 1/4 by 1/4 inch. Holes are pierced through plates so they can be fastened easily to panel. The black plate lettered may be lettered with pen or pencil as desired. We do not sell less than one dozen. Shipping weight, per dozen, 2 ounces. 63 J 6801

Panels

A new style of panel for radio work. Made of rubber base compound. Very attractive glossy black finish, which will retain its rich color indefinitely. Has higher dielectric strength than ever needed for panel work. Strong, practically unbreakable knobs and arms. Moisture proof. Thickness, 3/8 inch. 1/4 Inch Thick

Wood Cabinets

in the radio field today is to put apparatus in cabinets—no, not only for appearance but also for protection against dust 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. The wood cabinets are rabbeted in to the front, like a dull antique finish. Dimensions given for height, width and depth are inside measurements.

Series Parallel Switch
Permits quick change from one circuit to another. Composition knob, polished black finish. Switch blades made of phosphor bronze, polished nickel finish. Shipping weight, 4 ounces. 63 J 6751

Dead End Switch

Used for dead ending unused portions of coils which produce greater efficiency. Four polished nickel finished arms are attached to bakelite strip. There is no metal, nor is there any moldings. Can be mounted on panels up to 1/4 inch thick. Shipping weight, 4 ounces. 49c

Radio Panel Plates

These panel plates will identity every connection. Made of brass with silver plated characters and "On" and "Off" which are 1/4 by 1/4 inch, the increase current and "On" which are 1/4 by 1/4 inch, and the decrease current and "On" which are 1/4 by 1/4 inch. Holes are pierced through plates so they can be fastened easily to panel. The black plate lettered may be lettered with pen or pencil as desired. We do not sell less than one dozen. Shipping weight, per dozen, 2 ounces. 63 J 6801

Panels

A new style of panel for radio work. Made of rubber base compound. Very attractive glossy black finish, which will retain its rich color indefinitely. Has higher dielectric strength than ever needed for panel work. Strong, practically unbreakable knobs and arms. Moisture proof. Thickness, 3/8 inch.

All merchandise in this catalogue shipped from Northern Illinois

Montgomery Ward & Co.
Bakelite Knob and Dial
A fine looking one-piece molded knob and dial. Black polished finish; 180 degree scale marked 0 to 180 in contrasting white enamel. Each. 3 ounces. Shipping weight, each. 3 ounces.

Marconi Knobs
A knob suitable for large panels. Two sizes; match perfectly. Black polished finish. Has 1/4-inch hole at bottom, tapering to 3/16-inch at top. Shipping weights: each, 3 ounces; per dozen, 1 pound.

New Government Style Knobs
Very neat appearing. Just the kind for highest class apparatus. Black polished finish, 1/4-inch bushings; 1/2 or 5/8-inch insert in knob. Shipping weights: each, 3 ounces; per dozen, 1 pound.

New Government Style Knobs—Hole for Shaft
Same style as above knobs. Look very attractive even on highest class apparatus. Black polished finish; 1/4-inch shaft hole. Top is countersunk for nut. Two holes in bottom for stay pins. Shipping weights, each, 3 ounces; per dozen, 1 pound.

Standard Knob
Polished black finish with metric bushing. Fitted with metal bushings. Diameter, 1 1/4 inches. Each. 20 cents. Dozen. 2.25

Inductance Switch and Dial
This device does away with the usual awkward and unsightly set of switch and switch levers. One complete knob with vernier adjustment which can be engaged or disengaged as desired. One complete knob and dial with vernier adjustment which can be engaged or disengaged as desired. One complete knob and dial with vernier adjustment which can be engaged or disengaged as desired. One complete knob and dial with vernier adjustment which can be engaged or disengaged as desired. One complete knob and dial with vernier adjustment which can be engaged or disengaged as desired. One complete knob and dial with vernier adjustment which can be engaged or disengaged as desired.

Vernier Adjuster
This little device can be mounted on the edge of any dial and will enable you to tune very close and sharp. Spring brass lever. Pressure constant. Each. 50 cents.
Radio Jacks
Well Made— Attractively Priced
Especially designed for radio work, with compact, carefully constructed, flush finished, may be mounted on or panels up to 1/4 inch in thickness. Length 3/4 inch. Weight, 3 ounces.
Shipping, each, 3 ounces.

State type wanted.

63 J 6780—Open circuit. ... .48c
63 J 6781—Closed circuit. 56c
63 J 6782—2 circuit. ... .68c
63 J 6783—3 surging, single circuit. Filament control. ... .76c
63 J 6784—Splitting, two circuit. Filament control. ... .84c

Control Switch Radio Automatic Filament
For Detector Two-Stage Amplifier
Replaces three filament control jacks and plugs. Phones or loud number hooked up to switch can be instantly put in circuit with either detector, first or second stage of amplification. Turns off filament current as tubes are being used. Furnished with knob and pointers, directions and blueprint of connections. Shipping weight, 1/2 pound. $3.95

Radio Plug
Especially designed for use in connection with any type of telephone system. Also useful for use with transmitting cord. Screw connections. No soldering. Small and compact. Weight, 3 ounces. Shipping, 3 ounces.

63 J 6785

Three Cord Radio Plug
Arranged to take 3 sets of phone cords. Connections easily and quickly made. Attractively turning round body. Shipping weight, 4 ounces. $1.19

Universal Radio Plug
Fits any standard jack. Cords easy to connect. Shipping weight, 3 ounces. ... .75c

63 J 6790

Radio Plug
Black composition body fits any standard jack. Takes two standard plugs permitting use of one or two head sets at once. Weight, 1 pound. Shipping, 1 pound.

63 J 6791

Facent Multijack
This simple device enables you to connect up three heads, or circuits, by merely plugging in any number of any receiving set, or two sets of phones and a loud box, as you can see, without using any new connections. All standard plug weight, 4 ounces. $1.26

63 J 6794

Special Two-Circuit Jack
This well constructed, well finished switch is especially made to suit all needs. It is small and compact. Can be mounted on any panel up to 1/4 inch thick. Perfect contact. Well insulated springs. Shipping weight, 3 ounces.

63 J 6787

Standard Radio Plug
This is a well designed plug intended especially for use with the above jack. Well finished copper barrel which can be removed readily. Connecting cord can be soldered firmly to contact springs. Shipping weight, 3 ounces.

63 J 6788

Special Inductance Switches
High grade, smooth working switches. Black composition body, nickel plated, polished nickel finish. Nickel bronze springs and polished nickel bolts giving adjustable to any thickness up to 1/4 inch. Perfect contact. Shipping weight, 2 ounces.

63 J 6773—Radius. 1 inch. ... .23c
63 J 6774—Radius. 11/4 inches. ... .23c
63 J 6775—Radius. 11/2 inches. ... .23c
63 J 6776—Radius. 2 inches. ... .25c

Single Porcelain Baseknife Switch
Contacts and terminals made of heavy copper, satisfactory for antenna switches, although we recommend the switches listed on Page 34. Can also be used on other parts of apparatus. Shipping weights: 6 and 10 ounces.

63 J 2684—Single pole, single throw switch. Base size, 1 1/2 inches by 1 3/4 inches. ... .18c
63 J 2686—Single pole, double throw switch. Base size, 1 1/2 inches by 1 3/4 inches. ... .28c

Double Porcelain Baseknife Switch
Contacts and terminals made of heavy copper. Very satisfactory for antenna switches, although not recommended. Can also be used on other parts of apparatus. Shipping weights: 10 ounces and 1 pound.

63 J 2687—Double pole, single throw switch. Base size, 1 1/2 inches by 1 3/4 inches. ... .39c
63 J 2688—Double pole, double throw switch. Base size, 1 1/2 inches by 2 inches. ... .45c

Binding Posts
Metal parts of brass. All have 5/8 inch long 9/6 screws with washers. Plugs given are from bottom of shoulder to top of knob, and do not include screw. Shipping weight, per dozen, 8 ounces.

63 J 5601—Length, 1/2 inch. Hand buffed, polished nickel finish. Each, 10c. Dozen, $1.26
63 J 5603—Length, 3/8 inch. Hand buffed, polished nickel finish. Each, 10c. Dozen, $1.26
63 J 5602—Length, 1/2 inch. Tumbel plate, nickel finish. Each, 4c. Dozen, 36c
63 J 5636—Length, 3/8 inch. Hand buffed, polished nickel finish. Each, 8c. Dozen, 96c
63 J 5638—Length, 1/2 inch. Hand buffed, polished nickel finish. Each, 10c. Dozen, 96c
63 J 5644—Length, 1 1/8 inch. With polished brass unique knob, hand buffed, polished nickel barrel. Each, 6c. Dozen, 48c
63 J 5605—Large size polished black molding, brass top. Bases made onto 1 inch long 9/6 screw. Length of base and knob, 3/4 inch. Each, 19c. Dozen $1.15

New Style Binding Post
A specially constructed binding post. Has a non-removable spliced knob. May be connected to any panel up to 1/4 inch thick. Made of brass. Fitted with copper lug, polished nickel finish. Each, 12c. Dozen, $1.20

Switch Points
Made of brass. All have 1/16 inch screws or shanks threaded 5/6 and are made with two nuts. Shipping weight, per dozen, 4 ounces.

63 J 5650—1/4 by 1/2 head. Hand buffed, polished nickel finish. Each, 8c. Dozen, 96c
63 J 5648—Head, 1/2 inch diameter, 1/2 inch high. Hand buffed, polished nickel finish. Each, 3c. Dozen, 36c
63 J 5649—Head, 3/8 inch diameter, 1/2 inch high. Hand buffed, polished nickel finish. Each, 3c. Dozen, 36c
63 J 5652—Head, 3/8 inch diameter by 1/2 inch high. Tumbel plate, nickel finish. Per dozen, 18c

Switch Stops
Made of brass, hand buffed polished nickel finish. Will fit any panel up to 1/4 inch thick. Supplied with one locknut, shipping weight of base, 4 ounces.

63 J 5609—4 screws for 1/2 inch head. Black, nickel finish. Each, 1c. Per dozen, 10c
63 J 5611—Tumbel plate, nickel finish. Each, 1c. Per dozen, 10c

Eby Binding Posts
A line of fine quality binding posts. Very best, built for long service. Very positive of holding. The tops are non-removable. Shipping weight, each, 2 ounces.

63 J 5568—Captain—large heavy binding post made of brass, hand buffed polished nickel finish. Top has knurled finger hold knob. Size of body, 1/2 inches high; 1/2 inch in diameter. Fitted with 3/16 inch screw and washer. Nuts and washers will accommodate No. 6 or smaller wire. Each, 36c. Dozen, $1.92
63 J 5569—Sergeant—medium size binding post made of brass, hand buffed polished nickel finish. Top has knurled finger hold knob, size opened: 3/8 inch high; 5/8 inch diameter. Fitted with 3/16 inch screw and washer. Will take size 8 or smaller wire. Each, 36c. Dozen, $1.92
63 J 5570—Commander "H"—a large size binding post made of top and body of polished black molded composition. Highly polished, 1 5/8 inch high; diameter 3 inches. Fitted with 5/8 inch long 9/6 screw, nut and washer. Will accommodate standard telephone cord tip and 14 wire or smaller. Fitted with 5/8 inch long 9/6 screw, nut and washer. Each, 58c. Dozen, $3.57
63 J 5571—Renfrovety7—a large size binding post made of top and body of polished black molded composition. Highly polished, 1 5/8 inch high; diameter 3 inches. Fitted with 5/8 inch long 9/6 screw, nut and washer. Will accommodate standard telephone tip and 14 wire or smaller. Fitted with 5/8 inch long 9/6 screw, nut and washer. Each, 58c. Dozen, $3.57
63 J 5638
63 J 5602

63 J 5603
63 J 5635
63 J 5638
63 J 5644
63 J 5649
63 J 5652
63 J 5653
63 J 5654
63 J 5655
63 J 5656

All merchandise in this catalogue shipped from Northern Illinois

Montgomery Ward & Co.
**Nickedel Finish Bezel**


**Solid Brass Rod**

<table>
<thead>
<tr>
<th>Description</th>
<th>Price</th>
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<tbody>
<tr>
<td>Per shafts, etc.</td>
<td>Supplied in 8-inch lengths only. Shipping weight of 3 lengths.</td>
</tr>
<tr>
<td></td>
<td>63 J 6850</td>
</tr>
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<td></td>
<td>63 J 6852</td>
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<td></td>
<td>63 J 6854</td>
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</tbody>
</table>

**Threaded Brass Rod**

Clean, accurate threads. Sold in 8-inch lengths only. Shipping weight of 3 lengths. 4 ounces. 63 J 6875 -Size 6, 3 lengths $1.25 63 J 6876 -Size 10, 3 lengths 22¢ 63 J 6877 -Size 12, 3 lengths 25¢ 63 J 6878 -Size 14, 3 lengths 28¢

**Copper Lugs**

Fits on machine screws. Intended to be clamped and soldered to connecting wire. Shipping weights:

<table>
<thead>
<tr>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Per dozen</td>
<td>2 4 inches. Per gross</td>
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<tr>
<td></td>
<td>3</td>
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</table>

**Sheet Mica**

Used as dielectric for transformers. Clear firm sheets. Shipping weight, per dozen sheets: 3 4 ounces. 63 J 2552 -2 by 3 4 inches. Per gross 140c | $ .20 |
| 63 J 2553 -2 by 4 5 inches. Per dozen sheets | 1 20 |
| 63 J 2554 -2 by 6 inches. Per dozen sheets | .40 |
| 63 J 2555 -5 by 6 inches. Per dozen sheets | .70 |

**Varnish Cambric Tubing "Spaghetti"**

Perfectly shaped tubing of high dielectric strength. Used to cover connecting wires in instruments. Supplied proper insulation. Sizes:

<table>
<thead>
<tr>
<th>Description</th>
<th>Price</th>
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<tbody>
<tr>
<td>For shafts, etc.</td>
<td>Supplied in 8-inch lengths only. Shipping weight of 3 lengths. 4 ounces. 63 J 6866 -Size 12, wire and smaller. 3 feet</td>
</tr>
<tr>
<td></td>
<td>63 J 6867 -Size 12, wire and smaller. 3 feet</td>
</tr>
<tr>
<td></td>
<td>63 J 6868 -Size 30, wire and smaller. 3 feet</td>
</tr>
</tbody>
</table>

**Iron Setscrews**

Used for making connections. In sheets, size 6/8 by 5/8 inches, approximately 25 sheets to the pound. 63 J 5680 -Per pound 29¢

**Magnet Wire**

For building radio apparatus, building motors, other electrical apparatus, experimental work, etc. Per spool. 1/8 Inch thick. 63 J 1350 -Enameled Magnet Wire | 1 79c |
| 63 J 1400 | 1 59c |

**Switch Lever Set**

Consists of inch grade switch lever with ten switch points and ten knurled head switch knobs with nuts. They may be fitted to any panel up to 1/4 inch thick. 1200 Flat head, dished "dark knob; 1200 other parts brass with visible parts polished nickel finish. Shipping weight, per set. 63 J 5615 -Per set 49¢

**Radio Shellac Compound**

A heavy ester compound used to coat radio parts. High insulating properties, prevents shrinking, makes parts hold their shape better. shipping weight, 8 ounces. 63 J 6762 -2 ounces 20¢

**Insulating Varnish**

Used to coat wire coils. Drives quickly and forms a stiff hard film which will keep the wire in shape and prevents from capacity effects. Shipping weight, 8 ounces. 63 J 6760 -Per dozen 25¢
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 clear, 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 weight: 6 and 8 pounds.

$4.85

Spark Coil Transmitting Condenser
Designed for use with spark coil sets, magnetic of five 0 by 7 photo plates. Mahogany finished case. Permits working on 200 meter wave. Shipping weight, 3 pounds.

$1.48

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 edge-wound copper ribbon. Coupling varied by hinged, hinged to withstand hard, constant usage. Very efficient part for amateur sending stations. Shipping weight, 9 pounds.

$3.95

Zinc Spark Gap
For use with spark coil transmitting condensers. Base is molded composition. Metal parts are plated and polished. Can be used with coils up to 4 lamberts. Shipping weight, 2 pounds.

Improved Model Rotary Spark Gaps
Flat, pure copper stationary electrodes and cast aluminum rotary electrodes avoid pitting. Width of break is adjustable. Strong breeze generated by rotary electrode quickly cools working C. W. electrodes, thereby allowing transmission of wave of lowest decrement. All conducting metal is mounted on formica. Easily handles 40,000 volts without endangering motor windings. Constant, steady speed. Shipping weight, 10 pounds.

Size ½ K. W., ¼ H. P. Universal motor current. Speed, 4000 revolutions per minute. For 108 to 115-volt
563 J 5142 $14.80

Size 1 K. W., ½ H. P. Universal motor current. Speed, 3000 revolutions per minute. For 108 to 115-volt
563 J 5143 $16.95

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 switch shows you a considerable saving. Quick, easy operation. Shipping weight, 3 pounds.

$2.48

Standard Wireless Key
One of the finest keys made for radio work. Has either spark or C. W. Base lever and supports made of heavy brass in lacquered finish. Black composition knobs on switch and key. Shipping weight, 1 pound.

$2.89

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.

Amateur Telegraph Set

$2.65

Pony Relay
A relay which in conjunction with each instrument will improve the efficiency of any telegraph system. Several instruments are connected on the same line. Also used on burglar and alarm systems. finely finished. Made of high grade materials. Resistance, 20 ohms. Shipping weight, 3/4 pounds.

$3.10

Sounding
Same as used on our professional combination set. Nicely finished and strongly built to give long and accurate service. Shipping weight, 24 ounces.

$2.30

Professional Telegraph Set
Regulation instrument used by professional operators. Sounder, and key mounted on polished wood base. Frame of sounder polished brass, hard rubber knob, and circuit breaker. Strongly built throughout. Shipping weight, 3 pounds.

$3.98

Wireless Practice Set
Anyone learning wireless telegraphy transmission must know the code. Send for our 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 buzzers and attach posts to the set by means of a short piece of wire, press the handle of the key and a buzzing sound will be produced. In a very short time your ear will be accustomed to the various combinations of dots and dashes representing 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 easy 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 3 inch. Shipping weight, 3 pounds.

$1.90

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 gives fast, sure results. Printed on durable celluloid in convenient pocket size.

$0.48

All merchandise in this catalogue shipped from Northern Illinois
Thordarson Type R Transformers

For use on 105 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 built-in lugs for long-distance reception and gives 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.

<table>
<thead>
<tr>
<th>Article Number</th>
<th>K.V.A</th>
<th>Amperage</th>
<th>Sec. Volts</th>
<th>Each</th>
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</thead>
<tbody>
<tr>
<td>563 J 630</td>
<td>1/2</td>
<td>1 to 6</td>
<td>10,000</td>
<td>$18.90</td>
</tr>
<tr>
<td>563 J 632</td>
<td>1</td>
<td>2 1/2 to 14</td>
<td>25,000</td>
<td>34.20</td>
</tr>
</tbody>
</table>

Thordarson Type RS Transformers

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.

<table>
<thead>
<tr>
<th>Article Number</th>
<th>K.V.A</th>
<th>Sec. Volts</th>
<th>Shipping Weight</th>
<th>Each</th>
</tr>
</thead>
<tbody>
<tr>
<td>563 J 633</td>
<td>1/4</td>
<td>8,000</td>
<td>15 pounds</td>
<td>$9.00</td>
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<tr>
<td>563 J 635</td>
<td>1</td>
<td>25,000</td>
<td>35 pounds</td>
<td>26.65</td>
</tr>
</tbody>
</table>

Oscillation Transformer Radio Corporation UL-1008

This transformer is designed especially for use as a grid transformer on 2 -volt oscillator circuits. Consists of 25 turns of nickel plated copper wire 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 wood base which has four binding post connections, three of which have flexible copper clips and one for selecting pick-off points on the coil. The clips are easily attached or removed from coil, but when wing out is tightened they will positively hold their positions and can not be accidentally changed. Metal terminals for fastening to connecting wires are supplied. This 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 connected. Wound on bakelite tube, tapped at fifteenth turn, making three variations possible; namely, 10, 15 and 25 turns. Fits inside of the Acme C.W. Inductance shown above. Shipping weight 4 pounds.

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 wood and held in place by means of bakelite strips. Five insulating 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 connected. Wound on bakelite tube, tapped at fifteenth turn, making three variations possible; namely, 10, 15 and 25 turns. Fits inside of the Acme C.W. Inductance shown above. Shipping weight 4 pounds.

Tuska Molded C.W. Inductance

A high quality, efficiently designed article at an exceptionally low price. Wound on molded bakelite tubes 5 inches in diameter and 6 inches long. 42 turns of bare copper wire wound in molded threads. Carrying capacity, 50 watts. Shipping weight, 2 pounds.

Panel Mount Radio Microphone Set

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

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.

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 the Acme C.W. Inductance shown above. Shipping weight 2 pounds.

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 the Acme C.W. Inductance shown above. Shipping weight 2 pounds.

Transmitting Grid Leak

Radio Corp. UP-1718

Necessary in tube transmitting circuits. Shunted across grid condensers of oscillating tubes, they limit the potential accummulated 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 imbedded in a heat-resisting tube that will withstand sudden and extreme temperature changes. Metal terminals for tube connections. Resistance, 5000 ohms with mid-tap at 2500 ohms. For use with 5-watt transmitting tubes. Size, 1/8 by 5 inches. Shipping weight, 1 pound.

$1.10
Radio Corporation Transmission Transformer

This transformer is especially intended for low power radio telephone and C.W. telegraph sets. Two 5-watt transformers will supply 1.5 amperes into the average amateur aerial load, one tube is oscillating, and the other is as a plate. Radio telephone 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 in a 50-60 cycle current. They may also be used as power amplifiers in radio receiving circuits. Full wave rectification obtained from them is particularly useful for the operation of loud speakers. The 415 volt. Base. Plate voltage, 7.5 volts; filament voltage, 50 volts normal; plate current, 0.5 amperes. Weight, 1 pound. Shipping weight, 5 pounds.

Kenotron Rectifier Tube

Intended for use with 5-watt power tubes and is rated at 20 watts. Changes alternating current taken from the output of a transformer to direct current. This rectifier is in every tube suitable for either plate or filament operation, and is the necessary generator for high voltage required by the plate. When the load on the tube is such that the D.C. is between 30 and 400 watts. Using in full wave rectification circuit, the direct current and watts output will be doubled. In full wave, voltage, 2.5; filament current. Alternating current input voltage, 500 volts stepped up from 110 volts. Weight, 7 pounds. Shipping weight, $7.50

Porcelain Transmitting Socket

The proper socket for transmitting tubes. Base 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.

Filament Rheostat

Radio Corporation PR-355

Designed especially to regulate power tube filament current. This model: base 2-3/4 inches diameter, with two concentric resistance windings. Original design is arranged to give separate values of: 2.5 ohms, 1.2 amperes: 3.5 ohms, 1.5 amperes: 5 ohms, 2.5 amperes: 1 ohms, 10 amperes. Shipping weight, 1 pound.

Our Special Power Tube Rheostat

A well designed, well made, moderate priced rheostat; 5-watt capacity, 150 ohms resistance. Base will stand heat up to 600° F. Easily connected. Can be mounted on panels up to 3/4 inch thick. Shipping weight, 3/4 ounce.

Kenotron Rectifier Tube

UV-216

Used as a series filament control in the filament circuit of a transmitting tube. It provides a relatively small inductance unit and it is more economical. Inductive capacity, .00005 MED. Intended to be used as a by-pass or coupling condenser. Shipping weight, 8 ounces.

Radio Corporation Plate Reactor

UP-145

Designed especially to regulate power tube filament current. This model: base 2-3/4 inches diameter, with two concentric resistance windings. Original design is arranged to give separate values of: 2.5 ohms, 1.2 amperes: 3.5 ohms, 1.5 amperes: 5 ohms, 2.5 amperes: 1 ohms, 10 amperes. Shipping weight, 1 pound.

Radio Corporation Power Transformer

UP-1368

Maximum Input, 325 Watts

This transformer connected to alternating current 100 to 115 volts, 50 to 60 cycle, will deliver proper voltage and current for plate and filament of Radiotron UV-202, 75-watt output. However, many tubes can be handled, and the current produced when passed through proper combinations of rectifiers, choke coils and condensers is suitable for radio telephone. In addition to C.W. or interrupted C.W. telegraphy. Plate winding output, 1,600 volts. Filament winding output, 75 watts. 3.75 or 7.5 volts. When transformer is connected to power supply line of from 100 to 115 volts, no filament rheostat is necessary.

Radio Corporation Transmitting Tube

Radiotron UV-202

This tube is especially intended for low power radio telephone and C.W. telegraph sets. Two 5-watt transformers will supply 1.5 amperes into the average amateur aerial load, one tube is oscillating, and the other is as a plate. Radio telephone 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 in a 50-60 cycle current. They may also be used as power amplifiers in radio receiving circuits. Full wave rectification obtained from them is particularly useful for the operation of loud speakers. The 415 volt. Base. Plate voltage, 7.5 volts; filament voltage, 50 volts normal; plate current, 0.5 amperes. Weight, 1 pound. Shipping weight, 5 pounds.

Condensers for C.W. Transmitter Set

Paradox type UC-1014, 0.0001 F., $2.25. Condensers, 0.0004, 0.0006, 0.001 MF, used as series or parallel condensers or as intermedium earth circuits. Shipping weight, 8 ounces.

All merchandise in this catalogue shipped from Northern Illinois

Montgomery Ward & Co.
Radio Motor Generators

These motor generators are especially designed to supply plate circuit current for transmitting tubes. Connect them up with any standard 6-colt amperes. Will deliver rated capacity 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 to order. Write for special information.

<table>
<thead>
<tr>
<th>Article Number</th>
<th>Voltage</th>
<th>Output</th>
<th>Watts</th>
<th>Will Handle</th>
<th>Shipping Weight</th>
<th>Each</th>
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</thead>
<tbody>
<tr>
<td>163 J 689</td>
<td>205</td>
<td>15</td>
<td>20</td>
<td>One 5-Watt</td>
<td>41 lbs</td>
<td>$29.50</td>
</tr>
<tr>
<td>163 J 697</td>
<td>100</td>
<td>25</td>
<td>40</td>
<td>Two 5-Watt</td>
<td>100 lbs</td>
<td>$38.00</td>
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<tr>
<td>163 J 699</td>
<td>1000</td>
<td>50</td>
<td>250</td>
<td>Two 5-Watt</td>
<td>105 lbs</td>
<td>$55.00</td>
</tr>
</tbody>
</table>

63 J 7206-0-15 amperes

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 in a transmitting set having a radiophone range of 50 miles and upward. Shipping weight, 45 pounds.

163 J 689 $60.00

6-Volt Radio Dynamotor

Will operate on a 6-volt storage battery. The proper 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, 1 1/2 pounds. Shipping weight, 2 pounds.

163 J 689 $35.00

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 enamelled flanges with white faces and accurate hand drawn scales. Shipping weights, each, 1 1/2 to 3 pounds.

Direct Current Ammeters

Pattern 51
Flange diameter, 3 1/4 inches; case diameter, 3 inches. $6.95
63 J 7149-0-1/2 amperes 6.95
Pattern 53
Flange diameter, 3 1/2 inches; case diameter, 2 1/2 inches. $5.40
63 J 7116-0-6 amperes 5.40

Direct Current Milliampere Meters

Pattern 54
Flange diam., 3 1/4 in.; case diam., 3 in. $6.95
63 J 7180-0-10 milliampere 6.95
63 J 7181-0-30 milliampere 6.95
63 J 7182-0-50 milliampere 6.95
63 J 7183-0-100 milliampere 6.95

Direct Current Voltmeters

Pattern 51
Flange diam., 3 1/4 in.; case diam., 3 in. $7.10
63 J 7149-0-10 volts 7.10
63 J 7149-0-50 volts 7.10
63 J 7149-0-100 volts 12.95

Pattern 53
Flange diam., 3 1/2 in.; case diam., 2 1/2 in. $6.95
63 J 7174-0-10 volts 6.95
63 J 7174-0-50 volts 12.30
63 J 7174-0-100 volts 26.95

Magnetic Modulators for Radio Telegraphy

Radio Corporation UT-1643 and UT-1357

These modulators work on the same principle as those used in high powered transmitting stations. When connected to a radio telephone they require no further adjustment or attention. Best of results can be obtained even with our 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 eliminates 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. Shipping weights, 2 and 3 pounds.

63 J 7205-UT-1643, 1/2 to 1 1/2 amperes $8.50
63 J 7206-UT-1357, 1 1/2 to 3 1/2 amperes 10.00

Radio Frequency Ammeter—Pattern 64

As an accessory to a receiver it 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. Shipping weight, 7/8 pounds. $11.25

Alternating Current Voltmeters and Ammeters

Pattern 74
Very accurate, steady readings. Flange diameter, 3 1/4 inches; case diameter, 3 1/4 inches. $7.20
63 J 7195-0-10 volts 7.20
63 J 7196-0-50 volts 7.20

Antenna Ammeters

Radio Corporation UM-530 and UM-532

These ammeters are of the hot wire type. They are 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, 3 1/2 inches; thickness, 4 1/4 inches. Provided with 3 1/4-inch long studs. Shipping weight, 1 1/2 pounds. $6.00
63 J 7186-0-2 amperes 6.00
63 J 7187-0-5 amperes 6.25

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 $7.25

All merchandise in this catalogue shipped from Northern Illinois 43
Install Your Own Lighting Fixtures

We don’t need to tell you the many advantages of electric light. Perhaps your house is electrically lighted right now; but have you the right kind of fixtures to get the greatest possible benefit and enjoyment out of that light? And do you know that fine new fixtures, appropriate for every room, can be had at very little cost and without hiring an electrician to install them? High prices never have a place in our catalogue. Big savings can be yours.

Send Today for a Copy of Our Free Lighting Fixtures and Electrical Goods Catalogue

This 66-page book is carefully and authoritatively written. It is profusely illustrated and covers the entire field of home illumination in a manner that is clear and to the point. It tells you just what you want to know and what you should do to obtain the best lighting effects for the lowest price. For instance, it may be a pleasant surprise to you to learn that you can obtain a complete Seven-Piece outfit for a five-room house for only $16.50! This outfit is illustrated at the left and is typical of the values we offer in this special catalogue.

All metal parts of our fixtures are solid brass. That certainly is an indication of quality. And the glassware of the inexpensive set shown is White Alabaster! Notice what this includes: A semi-indirect lighting fixture with three side lights; a similar fixture without sidelights; three pendants; a ceiling light, and a wall bracketed light.

There are many more values just as great as this in the Lighting Fixtures Catalogue. Another important thing to you, as a home owner, is this: You can do the easy, pleasant work of installing the fixtures yourself. It is not necessary to call in the services of an electrician. All our fixtures are so easily installed that you need not even be mechanically inclined. We have simplified the whole matter for you to such an extent that you will experience no difficulty whatever in doing perfect work yourself—and at a most attractive saving.

Our Free Instruction Manual Makes It Easy

But that is not all! In addition to furnishing you with complete and easily followed instructions, we maintain an Advisory and Estimating Department. This department is at your service at all times and is glad to furnish you estimates of material, costs, or any other information you may want. Let them help you with your problems.

Send today for your copy of our Lighting Fixtures Catalogue! In addition to lighting fixtures, it shows lamps of all kinds; electric irons, percolators, toasters, electric heaters, curling irons and vibrators; also water supply systems. It will save you many dollars. A post card brings it to you. Send now!

Special-Splash Proof Motor

110 Volt - 60 Cycle

1/4 H.P.

$11.95

This is one of the greatest values we ever have been able to offer our customers. This sturdy Motor is intended especially for driving churns, operating separators, pumps, washing machines, or for any other work requiring not over 1/4 horse power. An ordinary motor would be damaged by liquids splashed onto it—this one is splash-proof! The ends are entirely enclosed except for ventilators which prevent overheating on a continuous run. Shaft is 1/4 inch in diameter and is made of special steel. Large size, bronze bearings oiled from self closing oil cups on motor end frames. Holes in base arranged so slack may be removed from belt without changing location of motor. Attaches to any lighting circuit socket or receptacle of 110 volts, 60 cycles. Speed, 1750 revolutions per minute. Fitted with 10-foot cord and attaching plug, and 1/4-inch pulley for 5/8-inch round belt. Ship. weight, 39 lbs. $11.95

All merchandise in this catalogue is shipped from Northern Illinois
Newest Books on Radio, Telegraphy and Telephony

Operation of Wireless Telegraphy
Apparatus
The operation of wireless apparatus simply explained. International Radio
Abbreviations. 87 pages. Size, 5 by 7 inches. Paper bound.
57 J 3580 Postage, 4c extra

35 Easy Lessons in Radio
A systematic course in the elementary principles, written
plainly and simply explained. Will enable you to master the
details of radio communication. Easily understood and easily applied.
380 pages. 100 illustrations. Bound in cloth.

How to Make Radio Telephone and Telegraph
By A. Hyatt Verril
Intended particularly for the use of amateurs, and those who
wish to make use of or adjust wireless apparatus. 16 pages.
1 diagram, 14 lines. Postage, 4c extra.
57 J 3581 Postage, 4c extra

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How to Make and Use It
By A. Hyatt Verril

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By E. E. Bucher
Explains wireless transmission and reception of telegraphic code
Includes a series of problems, 330 pages. Illustrated.
Postage, 6c extra.
57 J 3584 Postage, 1c extra

Experimental Wireless Stations
By P. E. Edelman
The first and most comprehensive book of the recent
important radio improvements, some of which have
never before been published. It not only explains
how to make apparatus, but how to make apparatus
for short, medium and long wave
work.

Construction of Radio
Phone and Telegraph Receivers for Beginners
By M. B. Sleeper
The man who wants the real
toll of accomplishment builds
his own radio telephone and vacuum tube
receivers. Table of
wavelengths, capacity, inductance—all presented in
full. 67 illustrations. Size, 5 by 7 inches. Cloth bound.
57 J 4028 Postage, 65c extra

Radio for the Amateur
For him who
ishes to
Allers his own
radio apparatus.
Complete guide to
radio communication. Easily understood
and easily applied. 380 pages. 100 illustrations.
Bound in cloth.

Radio Call Book
Radio Call Book issued by the Bureau of
Com. 200 pages. 2
for
radio
and
radio
stations
alphabetically.
57 J 3576 Postage, 6c extra

Radio Instruments and Measurements
Tables and formulae from the
Bureau of Standards, Department of Commerce, Washington.
All the
that
ordinary
radio operator
experimen
ter should have. 330 pages.
Postage, 50c extra.
57 J 3591 Postage, 6c extra

How to Construct a Wireless
Club
By E. E. Bucher
Detailed instructions for building and operating amateur wire-
less telegraph apparatus. A companion volume of the book "Wireless
Construction and Installation for Beginners." 36 pages.
43 illustrations. Paper cover.
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Wireless Examinations
For the young men going into the Federal
Radio service. 142 questions and answers. 74 pages.
Postage, 10c extra.
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Wireless Construction
By E. E. Bucher

Radio Book
for Amateurs
By A. Hyatt Verril
It gives a history of
to the
radio service.
49 illustrations. Cloth bound.
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Radio Hookups
By M. B. Sleeper
It is indispensable to the radio experimenter to
build his own re-
ceptor and works up.
Size, 5 by 7 1/2 inches.
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The Wireless Experimenter's
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Touche's every basic principle of radio, includes tables for
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From the
of the
eral
radio.
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Explain's wireless transmission and reception of telegraphic code
Includes a series of problems, 330 pages. Illustrated.
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Vacuum Tube
Communication
By E. E. Bucher
It deals with the
radio apparatus.
Describes the vacuum
instruments. and its operation. 302 pages.
Cloth bound. Size, 6 by 9 inches.
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The ABC of Vacuum Tubes
Used in Radio
Reception
A book for the person who
ishes to
radio tubes. A book used in
radio receiving cir-
quipment. No previous
technical knowledge is necessary to understand it.
Illustrated. Paper cover.
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Practical Amateur
Wireless
Tackle
Compiled by the
Editor of the
Wireless Age
Building the station.
shows how the wireless apparatus.
Information for the amateur.
360 pages. 6 by 9 inches.
Paper bound.
57 J 3588 Postage, 30c extra

How to Build
Wireless Construction
By E. E. Bucher
Parlia-
mented
radio
and
commercial wireless instruments.
A companion volume to the book "Wireless
Construction and Installation for Beginners." 36 pages.
43 illustrations. Paper cover.
57 J 3577 Postage, 4c extra

Wireless Construction
By E. E. Bucher

Radio Book
for Beginners
By A. Hyatt Verril
It gives a history of
to the
radio service.
49 illustrations. Cloth bound.
57 J 3566 Postage, 8c extra

Radio Hookups
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It is indispensable to the radio experimenter to
build his own re-
ceptor and works up.
Size, 5 by 7 1/2 inches.
57 J 3582 Postage, 11c extra

The Wireless Experimenter's
Manual
By E. E. Bucher
Touche's every basic principle of radio, includes tables for
computation. Written in simple language that is easy to
understand.
Complete guide to
radio communication. Easily understood and easily applied.
380 pages. 100 illustrations. Size, 5 by 7 1/2 inches.
Become Familiar with Radio Terms

In this catalogue and in magazines there are many articles on radio, in which technical terms are used and many diagrams showing hookups, using terms and characters which are not generally understood. So that you may more clearly understand the articles written and the diagrams, we have prepared a glossary of the terms most commonly used.

With each word description we show the character used in designating the article referred to in the diagram. If you see a term in an article which you do not understand, refer to this page for an explanation. A study of the characters shown on this page will give you enough information so you can easily read a radio diagram.
**Study These Diagrams and Definitions**

The making of radio sets is an interesting study and hobby. The knowledge obtained through making your own set will better enable you to understand the working of the outfit and will simplify for you many seemingly complex pieces of apparatus and their workings. A few minutes study of the diagrams and definitions given on these two pages will greatly assist you in understanding the various radio descriptions and diagrams. There is no definite accepted standard set of characters used in making radio diagrams, but those shown here are most commonly used. The descriptions given are necessarily brief. For more detailed description and information see books listed on Page 45.

### Reactance Coil
A number of turns of wire wound on an iron core which offers resistance to changes of current that are established in it.

### Batteries in series
The polarity usually is marked in the diagram.

### Telephone Receivers
Telephone head set (receivers) usually shown in diagram.

### Grid Chopper (Ticker)
A small wheel with segments similar to a D. C. commutator, driven by a motor and used to interrupt the continuous waves of a tube transmitter.

### Helix
A variable inductance coil usually constructed with heavy copper or brass wire or hollow tubing. Used in radio transmitting sets.

### Oscillation Transformer
Consists of a tapped primary and movable secondary. Can be used for transmitting and receiving. For transmitting purposes it is constructed with heavy copper or brass wire or hollow tubing. The receiving oscillation transformer usually is called a loose coupler or a variocoupler.

### Condenser
Adjustable by steps
Condenser adjustable by steps. For transmitting purposes where one or more condenser units can be cut in or out, such as Leyden jars, large plates or a unit made of tinfoil and wax paper.

### Field Rheostat
Rheostat for controlling field current of D. C. or A. C. generator and D. C. motor.

### Rectifier Tube
Vacuum tube with two elements. Used to rectify or change alternating current into pulsating direct current. Tubes are used in radio transmitting.

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**Montgomery Ward & Co.**

All merchandise in this catalogue shipped from Northern Illinois.
Radio Makes Life More Interesting

It Brings News—Fun—Education and Endless Entertainment to Every Member of the Family

A LADDIN, rubbing his wonderful lamp, never achieved such marvels or had so much fun as does the radio fan who turns a knob and listens to what the whole world has to say.

Until you actually have a Radio Outfit in your home you can not realize how much pleasure it will bring to you and your family, how much more interesting your home will be, and how much you will learn about your United States.

Radio is simple; that is why it is so popular. It is inexpensive; every home may have an outfit of its own, and it spreads the world before you like an open story book.

What Is Radio?

A radio receiver is a wireless telephone working on the same principle as the wireless telegraph. However, instead of receiving the message in the dot and dash telegraph code, the sensitive receiving instrument reproduces for you the actual sound of the voice, just as does your telephone. But unlike your telephone, these sounds are not transmitted to you along wires; they come through the open air similar to sound waves. The radio waves are picked up by the aerial wires and conducted to your receiving instrument by your "lead in" wire. With a good outfit you can hear radio messages as plainly as you hear the voice of your neighbor over your telephone.

"In the Air" for Radio Fans

Practically every large city now has one or more broadcasting stations which send out regular daily programs. These stations have been established by educational and radio companies, newspapers, colleges, and often by the cities themselves. With a powerful receiver, no matter where you live there is almost no place in the United States from which you can not hear some of these stations. Even with one of the simpler outfits, if you live near a number of good size cities you may listen in on programs from several broadcasting stations.

This does not mean that you hear all these stations at once. You decide which one you wish to hear; tune in for that one station and no other station will interfere.

Your Radio Outfit Will Bring to You—

Music. Entire operas, musical comedies, concerts, dance music, vocal and instrumental numbers have been transmitted so perfectly that you could almost imagine yourself in the same room with the artists.

Market and Weather Reports. Up to the minute quotations on stocks, bonds and farm products as well as the official weather forecast, are sent out and reach radio fans hours before they appear in the daily papers.

Time. At a definite hour each day the exact time is signaled so that your clocks and watches may be set accurately.

News. Daily bulletins flash state, national and world news, sporting events, play by play, election returns and many other things you are interested in.

Lectures. Talks by well known men and women on art, science, politics, current events, and many other important, interesting subjects, are included in the daily radio programs.

Sermons. Many churches provide entire church services—sermon, music and all—by radio for shut-ins or for churches with no resident pastor.

Educational. Progressive state universities have installed radio transmitting stations and are sending out complete courses on timely subjects. In connection with their extension work, they are furnishing daily talks of special interest to farm men and women.

We Have a Set for You

In this book you will find a Radio Outfit to suit every pocketbook. The one for you to select depends upon what you want to hear and how much you wish to pay. Of course, the sensitiveness or receiving range of an outfit usually is in proportion to the price. The lower priced sets will receive satisfactorily for short distances, while with the best outfits, under favorable conditions, you can hear transmitting stations a thousand miles or more away.

On Page 26 we explain that the strength of the transmitting station, local geographical and weather conditions, the season of the year and even the time of day, affect all radio instruments no matter what their price. For that reason it is not possible for us to guarantee any set for any given receiving range.

However, with a good receiving set you always will be able to pick up something interesting and entertaining.

Our Guarantee Protects You

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.
Our Outfits Are Easy to Install

Our Simple Directions Are All the Instructions You Need

Our sets are easy to install because they are as simple as successful receiving instruments can be made, and because every part necessary to get a clear, distinct reception is included in the outfit. With each set we send complete directions which give you every bit of information you need to set up, use and enjoy your outfit.

You do not need to know electricity—you do not need previous experience or study. In our instructions each part is fully pictured and described and each connection is plainly marked. Follow these simple directions and you can not go wrong—you can not fail to be pleased and satisfied with the set you buy from us.

We Are In Step with Radio's Rapid March

In our receiving outfits you get the very latest developments in radio reception. Our sets are made from designs tested and approved by some of the foremost radio engineers, and the very newest successful improvements in radio reception are incorporated in the sets listed in this book.

Our Sets Are Thoroughly Tested

In our Chicago House we maintain a fully equipped testing station where many radio outfits have been given rigid tests. Our radio experts have selected for our stock only those instruments which have proven absolutely dependable and worth the prices at which we sell them.

Even after we have selected our stock, each type chosen to be listed in this book is given additional tests, not only in our station, but from various points around Chicago until we have assured ourselves that we are giving you the very best in radio equipment. We are thoroughly satisfied with the results of these tests—that is why we can safely guarantee that you will be well pleased with the set you select.

Your Set Will Always Be Useful

You need never fear that the radio outfit you buy from us will become out of date—that improvements in radio will make it impossible for you to receive messages with the outfit in which you have invested your money.

Of course, there will be improvements, both in transmitting and receiving instruments; but the basic principle upon which radio is founded always will remain the same—you always will be able to use and enjoy your radio outfit as long as you keep it in good condition.

Read Our Books on Radio

The more you learn about radio the more you want to know. On Page 45 are listed good books which will tell you all about this fascinating subject—how to build your own outfits; how to understand the telegraph code and signals; what famous radio engineers are discovering every day about this wonderful science. Read these books; build your own set; be a radio expert.

Build a Radio Set and Explore the Air

"Dad, mother, everybody! Come here and listen. She's working—she's working!"

Glue your ears to the headset, and sure enough, faint and far away you hear z-z-z-zt, z-z-zzt. Twist the tuner and the buzzing sound jumps right up next door and becomes da-da-da-dah, da-da-da-dah. You are listening in on a high power wireless station flashing messages across the continent. YOU have made a radio outfit that works.

Of course you are not the first fellow to make a successful radio outfit. Lots of boys have learned how to make them in school, but many more read the good books on radio, listed on Page 45, used their heads and went to work. They are listening to radio entertainment, and even the wireless messages sent by Uncle Sam and the high power commercial stations all over the country.

Radio is simple. You don't have to know all about electricity. And it is inexpensive; you can make the simplest receiver for but a few dollars. With a little more money you can build an outfit with a longer receiving range; and when you have more money to spend and know more about radio, you may be able to build a highly sensitive receiving set with which you can explore the air for thousands of miles in every direction.

Of course, you can buy a radio outfit complete. But to get the most: fun out of radio, build your own. No matter what kind of set you decide to construct, you will find every part you need listed in this book. Study radio as you put your set together, learn all you can about it, and then—MAKE MONEY OUT OF RADIO! Put up outfits for other people; teach others how to build sets, become a radio operator for church or public entertainments, stores or hotels. Learn the official code and become a wireless operator. There are fascinating jobs on land and sea for boys who are good operators.

Experiment with your set. It may be YOU who makes the biggest discovery of the age in radio, and wins fame and fortune. Radio is the coming profession; radio engineers are commanding big salaries, and holding jobs that are brimful of interest and adventure. It is the boys who are playing with radio today who will be the successful radio engineers of tomorrow.

To you parents whose sons want to look into radio, encourage them. It is the safest, cleanest and most profitable game they can play. The many hours and the few dollars they spend in exploring the air are investments in manhood.

All merchandise in this catalogue shipped from Northern Illinois
It Is Easy to Order Radio Outfits and Supplies from This Catalogue

I n 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. Each family should order under one name only, preferably the name of the head of the household. Write your full name and address plainly. Give your postoffice and state; also shipping point if it is different from post office. If you live in town, give street and house number; if you live in the country, give rural route and box number.

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

1. Give article number of each item, quantity desired, name of article, price 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 you send money, be sure to send by **registered** mail, securely folded in heavy paper.

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.

How to Return Goods

Under our unchanging policy of "Satisfaction Guaranteed or Your Money Back," you are at liberty to return any Radio goods which do not fully satisfy you. When goods are returned by parcel post or express, be sure to pack and wrap securely. Write us a letter giving full instructions regarding the charges you want made in your order; and if returned by express, enclose with your letter the receipt given you by the agent at the time you shipped the goods to us.

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<table>
<thead>
<tr>
<th>Scale of Parcel Post Charges</th>
</tr>
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<tr>
<td><strong>Radio Outfits and Supplies</strong></td>
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**Package Weight:**

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<th>Weight of Package</th>
<th>Local Zone</th>
<th>1st 2nd</th>
<th>3rd</th>
<th>4th</th>
<th>5th</th>
<th>6th</th>
<th>7th</th>
<th>8th</th>
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<tr>
<td>4 ounces</td>
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Order from our House nearest you

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<thead>
<tr>
<th>CHICAGO</th>
<th>FORT WORTH</th>
<th>PORTLAND, ORE.</th>
<th>KANSAS CITY</th>
<th>SAINT PAUL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Note:</td>
<td>Packages weighing more than 50 pounds cannot be shipped by parcel post beyond the 3rd zone. If your shipment weighs more than 50 pounds and you live beyond the 3rd zone, we will ship your order in two packages or more. Radio outfits equipped with batteries containing acid must be shipped by express, as the postal regulations exclude them from parcel post mail.</td>
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</tbody>
</table>
UNLESS the radio equipment you buy will deliver service, it is not a good investment no matter how little you pay for it. And unless you are a radio expert it is difficult to tell whether or not it will deliver service. At most stores, when you buy radio supplies they are yours—you must keep them even though they prove unsatisfactory.

People who buy their radio supplies from Montgomery Ward & Co. have three advantages—they pay less; they buy from a house which has established a reputation for dependable goods at low prices—and they are protected from mistakes or disappointment by our guarantee; for if the goods do not prove satisfactory they may be returned at our expense.

Our stock is complete; our goods have proved satisfactory to thousands of customers, and we sell them at the lowest prices at which reliable radio equipment can be sold.

$1.45
11-Plate Variable Condenser

$2.45
43-Plate Condenser

An 11-plate Condenser for $1.45 is far below the price of a few months ago, $1.65 for a 24-plate and $2.45 for a 43-plate are prices which mean great savings to you. A careful selection of the finest variable condensers is shown on Page 22.

$3.69
Receiver

Our Variometers (Page 23) are excellent in design and workmanship. The materials used are the best in their respective classes. Perfect working variometers at $1.95 and $3.10 really are bargains. We offer the finest on the market, with molded rotor and stator forms at proportionate prices.

$9.75
Loud Speaker

Higher prices are being asked for inferior sockets. Suitable for use with detector, amplifier and power tubes. Others are listed on Page 30.

CHICAGO   FORT WORTH   KANSAS CITY
PORTLAND, ORE.   SAINT PAUL

$9.55
Whenever you buy a Storage Battery, there is no way for you to tell exactly what you are getting—only the test of time will tell you how good the battery is. You can depend on Ward's quality. No. 563 J 402, 6-volt 40-ampere battery at $9.55 is among the best values to be had.

See Page 32

See Page 18 for Other Loud Speakers
Radio is bringing music to thousands of lonely homes. Entire operas and musical concerts are being sent over the radiophone to vast audiences, over wide territories. Are you getting your share of Radio Music?

If you are going in for Radio, you want the best equipment your money can buy. You want a dependable receiving outfit which will pick up messages at long range and bring them to you clearly and distinctly. You want either our Airline Special or our Airline De Luxe Complete Receiving Sets, depending on how much you wish to invest in radio.

Either of these sets comes to you complete. All you need do is erect your aerial, make a few simple connections and you are ready to "listen in." Clear, illustrated directions come with each outfit.

We have given both these outfits the most rigid tests, not only in our own testing station, but out in the country, with aerials strung up to flagpoles, windmills, trees—the same conditions under which you will use them. And they have given excellent results in long range receiving.

The Airline Special is a Long Distance Regenerative Audion Detector Receiving Set Complete. Turning to Pages 2 and 3 and read what it has actually done. There is not one of those receiving records that you yourself cannot equal or surpass with this outfit.

The Airline De Luxe, described on Pages 4 and 5, is a Long Distance Regenerative Audion Detector Receiving Set with a two stage Amplifier. It has a longer range than our Airline Special, and will bring in messages many times louder because of the amplifying feature. It is the ideal receiving outfit for home, church or school, and it can be used with a loud speaker, so the sound may be greatly amplified, making it possible for a room full of people to hear the radio programs.

For either of these outfits the investment in time and money is small, and the returns in education, information and enjoyment are large.