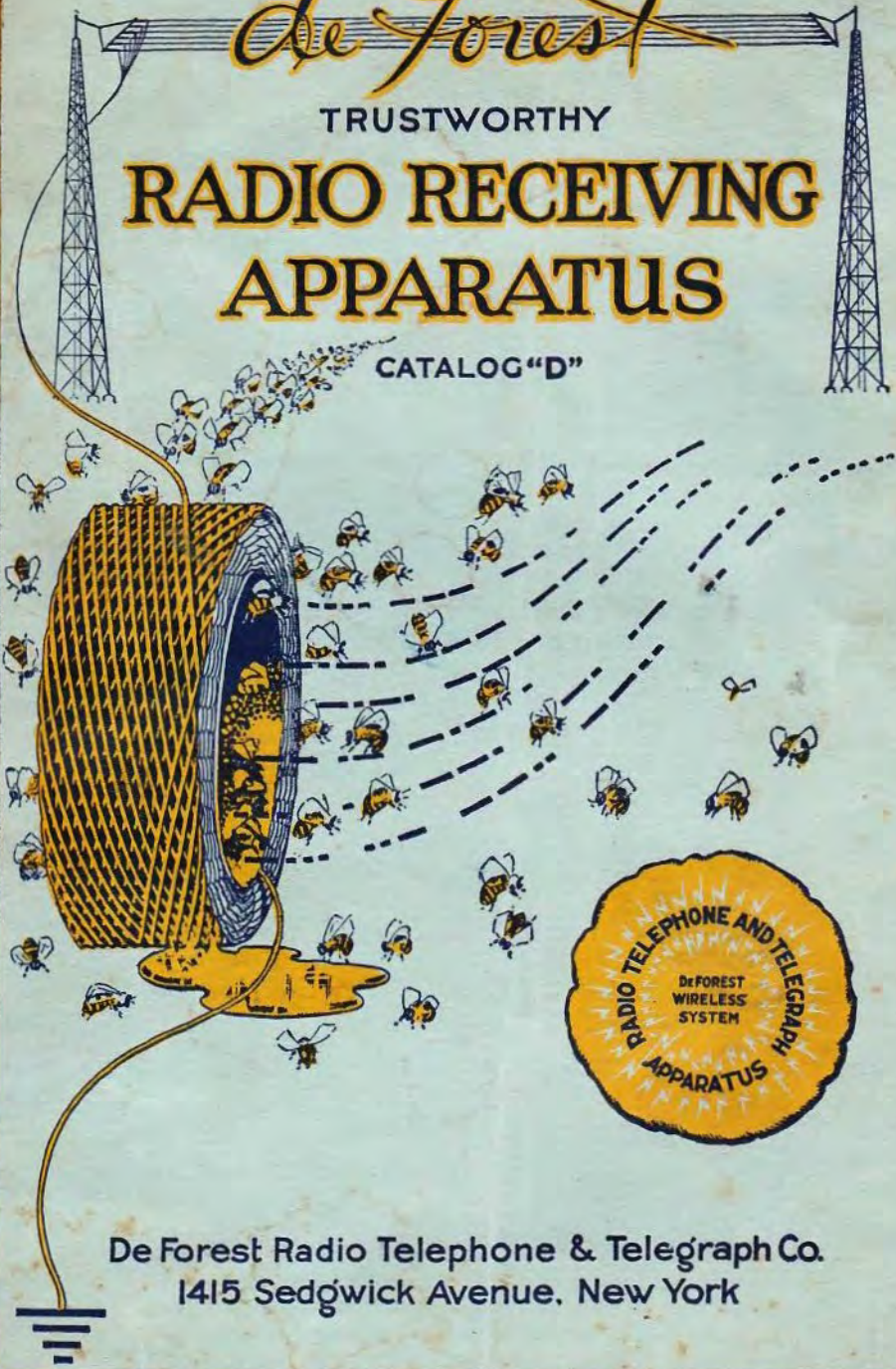


de Forest

TRUSTWORTHY

**RADIO RECEIVING
APPARATUS**

CATALOG "D"



De Forest Radio Telephone & Telegraph Co.
1415 Sedgwick Avenue, New York

WE GUARANTEE

That every article in this catalog is exactly as described and illustrated, and that the instruments are built in accordance with correct mechanical and electrical principles by skilled workmen.

We guarantee that the instruments purchased from us will satisfy you perfectly and that it represents full value for the price you pay.

We have rated our apparatus conservatively, as it is impossible to guarantee the range of radio apparatus.

If for any reason you are dissatisfied with any instrument purchased from us, return it, and we will replace it with exactly what you want or refund your money.

Our apparatus is sold by electrical supply dealers in the principal cities of the United States and foreign countries. If you cannot obtain it through your dealer, send us his name and address, or forward the order to us. It will receive prompt attention.

de Forest Radio Telephone and Telegraph Co.

General Offices: 1415 Sedgwick Avenue

Cable Address: Radiotel

New York City

The Audion Amplifier made possible Transcontinental Telephone Service.
The Audion Ultraudion is used in all long-distance Radio Telegraphy.
The Oscillion Transmitter made possible Trans-Oceanic Telephony.

CATALOGUE "D" OF
**de Forest Radio
Receiving Apparatus**



Approximately half size photograph showing open type of winding and relative size of short and long wave coils.

Type L, "Honey Comb" Wound Inductance Coils

THE de Forest Honeycomb Coils embody a new idea in radio coil design that is almost revolutionary in that it makes the usual large and cumbersome, home-made, cylindrical and multi-layer coils obsolete, and promises to replace the customary type of coil that is now used commercially. These coils not only possess this decided advantage in the saving of space and convenience in coupling, but they have also proven to be the most efficient, practical radio inductances ever designed. Surprising results have been obtained on test in their values for distributed capacity and high frequency resistance. A coil having a natural period of 1,725 meters and a direct current resistance of 20.4 ohms was found on test at the Radio Laboratories of an educational institution of the highest standing in this country, to have a distributed capacity of but 12.8 micro-microfarads and a high frequency resistance of only 33.5 ohms at a frequency of 23,500 cycles. This coil had an inductance of 65.4 millihenries and oscillated at a wave length of 15,250 meters when shunted with a condenser of .001 microfarad.

These are the most efficient and practical machine wound coils that can be sold at a reasonably low price. The winding is such that it approximates a bank winding in one direction. The coil is cellular in type, the turns of one layer crossing the preceding layer always at an angle thus making the distributed capacity a minimum.

Each inductance is mounted on a plug designed to be used in connection with our type LC coil mounting. They may be used as tuning,

loading and wavermeter coils, etc. No taps are provided, thus doing away with high resistance and decrement values, and gaining the greatest possible efficiency. By plugging in different sized coils, great flexibility of adjustment is obtained and all ranges of wave lengths can be easily covered without the use of tap or dead end switches. The coils are so mounted and connected to the plugs that the windings always run in the same direction and therefore all coils are "poled" the same.

The Use of the Honeycomb Coils

The de Forest honeycomb wound inductances are to be used exactly like any other radio inductances having a fixed value.

They differ from the inductances usually employed for radio telegraphy in that instead of having the inefficient taps connected to cumbersome switches, each coil is provided with a plug which fits into a receptacle the coil mounting which takes the place of the mechanical coupler. Condensers or variometers in series or parallel with the coils provide means of tuning the circuit to the given wave length, and if it is desired to receive stations whose wave lengths are beyond the range of the condensers, larger coils are substituted. In this way the losses due to dead ends and high resistance taps are done away with.

Wave Length Ranges of De Forest Honeycomb Coils

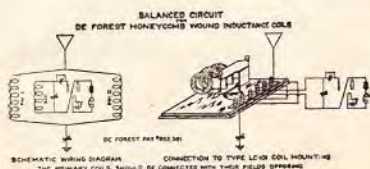
The proper coils for use as secondaries of a loose coupler shunted by the usual .001 mfd. variable air condenser may be readily chosen from the table accompanying the price list.

It is not so easy to choose the proper primary coils as their size depends upon both the capacity of the primary tuning condenser and the capacity of the aerial which as a rule is not known. The following general data is given for average conditions but we shall be glad to recommend the coils best suited to an aerial if its mechanical dimensions (provided its capacity is unknown) together with a description of its location with regard to nearby buildings, trees, tin roofs, etc., is sent us. We must also know the size of the primary tuning condenser.

With an average aerial of .0007 mfd. capacity, primary condenser of .0015 mfd. capacity and a secondary condenser .001 mfd. capacity, the coils whose catalog numbers appear below will respond to the wave-lengths as shown.

Honeycomb Coils Suggested for Single Primary Circuit

Type of Service	Wavelength Range (Meters)	Primary Coil Cat. No.	Secondary Coil Cat. No.	Primary Condenser Connection
Amateur	180-325	L-35	L-25	Series
Commercial	525-710	L-100	L-75	Series
Navy Calling	900-1350	L-200	L-100	Series
Arlington Time	1420-3350	L-300	L-250	Series
Foreign and Press	7600-11900	L-500	L-1000	Shunt
Foreign and Press	10500-16800	L-600	L-1000	Shunt



We recommend the balanced Primary Circuit shown here for undamped wave reception. It will be found very selective, anti-static and remarkably efficient. For this circuit, in connection with the aerial and tuning condensers mentioned above, we recommend the following Honeycomb Coils:

Honeycomb Coils Suggested for Balanced Primary Circuit

Type of Service	Wavelength Range (Meters)	Primary Coil Cat. No.	Secondary Coil Cat. No.	Primary Condenser Connection
Amateur	150-350	2 L-50	L-25	Series
Commercial	450-1050	2 L-150	L-75	Series
Navy Calling	835-1950	2 L-250	L-150	Series
Arlington Time	1760-4000	2 L-500	L-250	Series
Foreign and Press	5200-12500	2 L-1500	L-600	Series
Foreign and Press	12000-20000	2 L-1000	L-1250	Shunt

Advantages of De Forest Honeycomb Wound Inductance Coils Over the Old Style Loose Coupler

1. The smallest values of distributed capacity ever obtained in a practical machine wound inductance coil eliminating the usual losses due to large values of distributed capacity, and permitting in this way the transference of the maximum amount of the received energy to the detector.
2. Extremely low resistance values at high frequency, preventing the usual resistance losses and consequently high decrements.
3. No losses due to "deadends," since the whole of the inductance is used throughout the complete range of wave lengths.
4. No losses due to high resistances in tap leads and the switches to which they are connected.
5. Sharp resonance at any frequency or broad tuning, if desired, depending only upon the values of capacity with which the coil is used.
6. Maximum flexibility and adjustment with minimum and accurate variations of coupling.
7. A minimum amount of operating table space which remains constant regardless of wave length.
8. A single tuner and detector circuit comprising a single receiving set capable of receiving any and all stations with identical and maximum efficiency.
9. Minimum cost with the added advantage that coils for certain ranges of wave length may be purchased with the idea of increasing the wave length range or receiving ability of a set by the addition of more coils at a latter date.

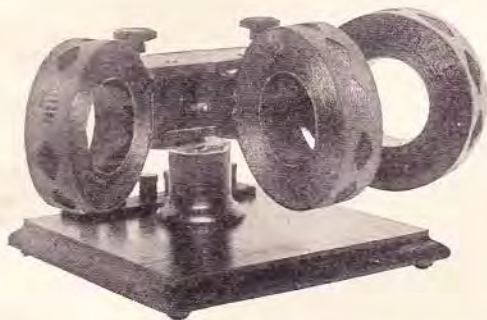
Cat. No.	Milhenries Inductance Appx.	App. Wavelength Range in Meters in shunt with ordinary .001 Mfd. Variable Air Condenser	Code Words	Price Mounted on plug	Shipping Wgt. Lbs.
L- 25	.040	130— 375	Calhoun	\$1.40	1½
L- 35	.075	180— 515	Calthrop	1.45	1½
L- 50	.15	240— 730	Camden	1.52	1½
L- 75	.3	330— 1030	Canning	1.60	1½
L- 100	.6	450— 1460	Capgrave	1.70	2
L- 150	1.3	660— 2200	Carew	1.80	2
L- 200	2.3	930— 2850	Carlyle	1.90	2
L- 250	4.5	1300— 4000	Carpenter	2.00	2
L- 300	6.5	1550— 4800	Carr	2.10	2
L- 400	11.	2050— 6300	Carter	2.25	2
L- 500	20.	3000— 8500	Castle	2.40	2
L- 600	40.	4000—12000	Catlen	2.65	2½
L- 750	65.	5000—15000	Caxton	2.80	2½
L-1000	100.	6200—19000	Century	3.00	2½
L-1250	125.	7000—21000	Chalmers	3.35	2½
L-1500	175.	8200—25000	Child	3.60	2½

All Coils have an inside diameter of 2", a width of 1", an outside diameter varying from 2¼", to 4½". Coils are always furnished with the plug mounting.

Type LC-100, 101 and 201 Inductance Coil Mountings

A NEW development in receiving apparatus which like the other pieces described in this catalog, has been found on test, to be much superior both in electrical sensitiveness and mechanical adjustment to anything previously tried. Its ease and simplicity of operation, together with its extreme sensitiveness to slight variations of coupling, and the remarkable gains in signal strength resulting therefrom will be greatly appreciated.

The mounting consists of three plug receptacles fastened to a bakelite framework mounted on a pedestal which is in turn fastened to a base. The receptacles are designed to hold our L type Honeycomb Inductance Coils. The center receptacle is fixed and the two outside receptacles move on bearings and are geared to small pinions so that small variations of coupling between the coils can be easily obtained by turning the bakelite knobs. The knobs are so located as to be readily accessible without bringing the hand close enough to the coils to produce objectional capacity effects.



The terminals of the receptacles are connected by heavy Litz to six hard rubber covered binding posts at the back of the base so that one, two or three of the coils may be used as desired. By means of the interchangability feature in this plug type of coil mounting, inductances of any size may be used, and when connected with variometers or variable condensers, a tapless, and therefore a most efficient tuner, capable of working equally

well over all ranges of wave lengths, is provided.

This coil mounting holds two primaries and a secondary for use on balance circuits. It may, of course, be used in any other way the operator sees fit as independent connections are provided for each of the coils.

We also furnish the type LC-101 coil mounting with a US 100 Primary Condenser Switch mounted on its base. The switch is connected in the primary circuit as shown on another page, and an extra pair of binding posts is provided on the rear for connecting to the primary tuning condenser. This is the ideal coil mounting for use with vernier type condensers. It and two variable condensers constitute an experimental tuner for placing on the operating table where it is readily accessible for changing connections.

The metal parts of the mountings are of brass nickel plated. The pedestal and base are of oak, finished in "Early English" so that the whole provides a decidedly attractive piece of apparatus.

- Cat. No. LC-100.** Inductance Coil Mounting without base or pedestal. Code word: Dalton. Shipping Weight, 3 lbs. Price \$9.00.
- Cat. No. LC-101.** Inductance Coil Mounting on Oak Base as shown. Code word: Dennison. Shipping Weight, 4 lbs. Price \$12.00.
- Cat. No. LC-201.** Combination Triple Adjustable Coil Mounting and Primary Condenser Switch Mounted on Oak Base. Code word: Denver. Shipping Weight 4 lbs. Price \$14.00.

The mountings are always furnished without coils.

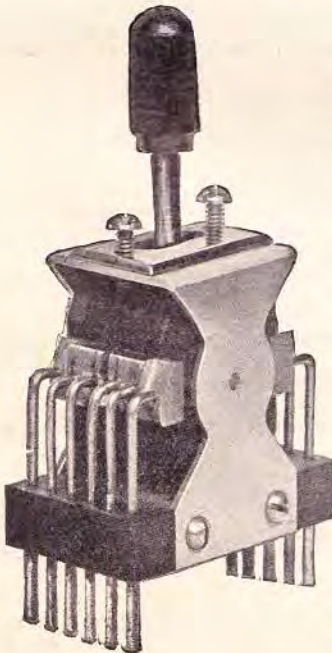
Weather and Dust Proof Galena Crystal Detector

THE crystal is tested and guaranteed as to sensitivity, and is mounted in a disc of Wood's metal alloy, clamped in a mounting at the bottom of a glass tube and is held rigidly in place by a set screw. Contact is made by a spiral spring of phosphor bronze. The adjustment arm, which passes through a ball and socket joint, gives any adjustment required, and enables making contact with any point on the crystal. Although the adjustment is particularly flexible, it may be further adjusted by the set screw on the rear post, so that when once set it cannot jar out of place, and continuous service, barring burnouts, is assured. The dust proof housing is a very valuable feature. The entire is mounted on a Formica base $2\frac{1}{2}'' \times 2'' \times \frac{3}{8}''$, on which there are also mounted two brass binding posts, the tops of which cannot be lost. Overall height $3\frac{3}{8}''$. This detector, which is of a pleasing design, makes a very handy thing to have about when your vacuum tube has burned out.



Cat. No. D-101. Crystal Detector. Code word: Godwin. Shipping Weight 1 lb. Net Weight 8 oz. Price \$2.60.

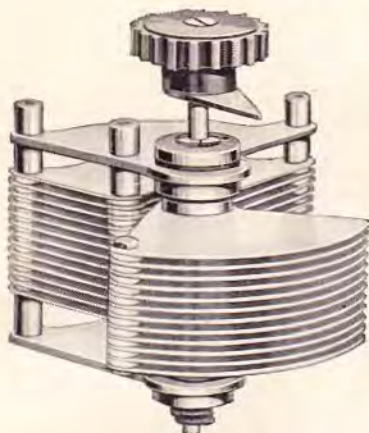
Master Anti-Capacity Key Switch



An anti-capacity key switch which was primarily designed for wavemeter work where a switch possessing a large distributed capacity is a great detriment. Consists of a telephone key lever to which is fastened a cylinder of bakelite containing four contact blocks. Mounted on each block are 3 phosphor bronze contact clips which mesh with phosphor bronze wire contact fingers, according to whether or not the switch arm is in a certain position. The contact fingers are but $1-16''$ in diameter so that there is a wide spacing between them and the capacity therefore is a minimum. Perfect contact with the clips is maintained by making the springs long and rigid. This is possible because due to the shape of the clip punching, the movement is very slight, though at the same time a break wide enough is obtained. This is a three position key, which will replace a switch of the four-pole-double-throw type. It is particularly recommended for wavemeter work, and for master switching a crystal receiver set to audion detector reception, etc. The knob is of electrose and a small nickered plate is provided for insertion over the hole through which the arm projects in the panel.

Cat. No. S-200. Code word: Gotch. Shipping Weight 1 lb. Price \$2.75

Type CV-500 90° Variable Air Condenser



THIS is a new and improved design in variable air condensers.

The 13 aluminum stationary plates are held together by two brass end plates through which rods are passed. The spacers are of aluminum. On the shaft is mounted 12 aluminum rotary plates separated by extra large spacers to prevent change in location and, as an additional precaution, are held together in one corner by a sustaining rod similar to those for the stationary plates. The large shaft is pig-tailed to the end washer, preventing any variation in resistance due to improper contact, and is insulated from the end plates by hard rubber bushings held in place rigidly by threaded washers. Constant tension is maintained by a spring washer, and is adjustable through the bearing in the bottom end. All nuts are soldered.

The capacity is .0005 mfd. This condenser has great mechanical strength due to its rugged construction, and is not to be compared to the cheap stamped or cast condenser usually offered to experimenters and amateurs.

The design embodies a wider air gap than is usual in a condenser of a similar capacity, thus assuring further robustness and eliminating short circuits between plates under the very hardest usage. Overall dimensions $4\frac{3}{8}$ " high, $3\frac{1}{4}$ " wide, $3\frac{3}{4}$ " long.

Cat. No. CV-500. Code word: Eaton. Shipping Weight 2 lbs. Net Weight 1 lb. Price, including knob, scale and pointer, ready to mount on your panel, \$5.25.

De Forest Vernier Type Variable Air Condenser

This de Forest novelty is the result of long experience in the use of condensers of the usual type and was developed because the de Forest laboratories found it impossible to buy a standard condenser that satisfied their requirements. These requirements should be the same as those of the up-to-date experimenter and radio operator.

Those who have used a single plate variable condenser in parallel with a large variable air condenser for heterodyne receiving, will appreciate the value of having these two condensers combined into one instrument, and those who have used a variable air condenser alone for this type of receiving and have suffered thereby with capacity effects from the hand of the operator when trying to get a "zero" beat adjustment, should greet this new device warmly.

This is especially true when receiving radio telephone waves where this vernier or inter-degree type of condenser becomes practically invaluable. The prime advantage in using the vernier plate is that any capacity effects due to the operator's body are immediately compensated for.

Although the vernier attachment is the striking novelty of this piece of apparatus, there are other features that make it the leading condenser on the market. Electrically, the plates are designed to give a very small minimum capacity and a straight line wave-length curve, the advantages of which are self-evident. The minimum capacity of our CV-1500 type

is 70 micro-microfarads. With the vernier in the "IN" position, this capacity can be increased to 85 micro-microfarads. These figures give an idea of what adjustment may be obtained in the zero region. Mechanically the condenser has been built for strength and particularly for its ability "to stay put" when once adjusted. For this reason it is ideal for wavemeter work, as well as for a good laboratory standard.

The mechanical design is similar to that of type CV-500 or 90 degrees condenser, although the plates are shaped differently. The bushings are of a new composition which has been found by exhaustive tests to be better than bakelite for insulation resistance.



Type CV1513 Vernier Condenser in Glass Case.

CV-1513

It is used in this type of condenser for the tops and bottoms as well. Contrary to the usual practice, the rotary plates, in addition to being fixed firmly to the shaft are rigidly bound together by a rod and spacers through special projections on their edges. This feature together with the extra heavy thickness of the aluminum plates, gives such stability that even when the condenser is roughly handled the rotary plates will not bend or become displaced with respect to the stationary plates. The capacity therefore does not change and the condenser cannot get out of calibration. In addition to having a perfect bearing, the shaft is pig-tailed and is held in position by a spring washer permitting no resistance and adjustment change with continued use. Composition stops for the rotary plates are provided in the body of the condenser so that the usual wear due to the pointer of the old type of condenser bounding against the stops is dispensed with.

The vernier or inter-degree attachment consists of one stationary and one rotary plate mounted above the main condenser. The stationary plate is held in place by the three sustaining rods for the main condenser and the rotary plate is mounted on a sleeve which fits over the shaft and projects up through the top. Fastened to this sleeve is a collar into which is screwed the bakelite vernier handle. This handle can be unscrewed for shipment if it is desired to save space. The handle projects well over the top and has a free and easy movement so that it can be manipulated with the index finger of the operator, thus providing minute changes of capacity without appreciable effects due to the body of the operator. The adjustment is maintained by a spring washer so that it has the same easy movement when the condenser is mounted horizontally on a panel. The vernier handle can be locked in place by two clips on the top marked "IN" and "OUT." The vernier plate sleeve is firmly pig-tailed to the rotary part of the main condenser to prohibit changes in resistance and adjustment.

A white celluloid disc on which is engraved a 100 division scale in black is fastened to a $1\frac{1}{2}$ " bakelite knob. The non-metallic disc prevents change of capacity and the 100 divisions instead of 180 provides an easy scale for plotting curves.

The condenser is provided with two large bakelite covered binding posts, slotted for easy connection.

These condensers are provided with and without the vernier attachment and in a shielded and non-shielded mounting. The non-shielded mounting consists of a glass cylinder supporting a round top which is bound to a square bottom by four rods. The shielded type is provided with an aluminum case. The under side of the top is covered with a metallic disc shield in

electrical connection with the aluminum case and rotary plates so that when the case is grounded the body of the operator has absolutely no effect upon the capacity of the condenser.

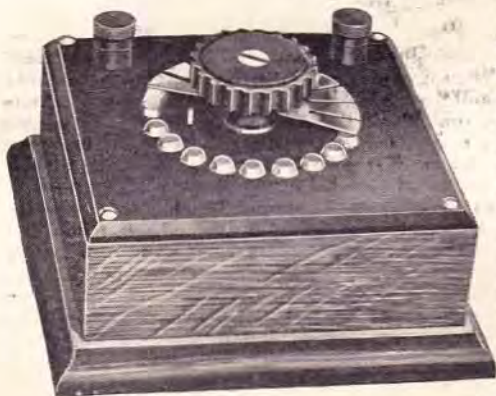
We also furnish the non-shielded condenser with a glass jar and with a hole and plug in the top for use with oil where larger capacities are required, or where it is desired to use a condenser on fairly large potentials. All types are provided with screw holes in the base for fastening to the operating table.

The finish of the metallic parts is polished nickel, which gives a beautiful effect against the polished black top.

Code Words	Cat. No.	Cap. Mfd.	Mounting	Price
Edwards	CV-1000	.001	Unmounted without vernier	\$12.40
Elliott	CV-1003	.001	Unmounted with vernier	14.25
Evans	CV-1010	.001	In standard glass case without vernier	17.50
Fabyan	CV-1013	.001	In standard glass case with vernier	19.50
Faraday	CV-1020	.001	Shielded without vernier in aluminum case	17.25
Fenton	CV-1023	.001	Shielded with vernier in aluminum case	19.00
Finch	CV-1030	.001	For oil without vernier in glass jar	18.75
Fitzroy	CV-1033	.001	For oil with vernier in glass jar	20.60
Fletcher	CV-1500	.0015	Unmounted without vernier	14.00
Flint	CV-1503	.0015	Unmounted with vernier	15.60
Floris	CV-1510	.0015	In standard glass case without vernier	19.00
Forbes	CV-1513	.0015	In standard glass case with vernier	20.60
Foster	CV-1520	.0015	Shielded without vernier in aluminum case	18.50
Fox	CV-1523	.0015	Shielded with vernier in aluminum case	20.40
Freneau	CV-1530	.0015	For oil without vernier in glass jar	20.00
Frost	CV-1533	.0015	For oil with vernier in glass jar	22.00

Note: In ordering unmounted condensers, state whether for 3-16", 1/4", or 5-16" panel.

Bridging or Loading Condenser



providing a handsome appearance. Oak cabinet has overall dimensions of 5 1/4" x 5 1/4" x 3 1/8" high.

Ideal when used to increase the range of a variable air condenser, or as a bridging condenser where continuously variable values or capacity are not required. It can also be used as a primary or secondary condenser where the tuning inductances are tapped. Made in the following sizes:

Code Words	Catalog Number	Approximate Capacity (Max.)	Net Weight	Shipping Weight	Price
Genung	CS-1502	.0015 M.F.	1 3/4 lbs.	4 lbs.	\$6.95
Glen	CS-3002	.003 M.F.	1 1/4 lbs.	4 lbs.	6.95

CONSISTS of a small sectional mica condenser of ten taps which are thrown in and out of circuit by a fan switch. The sections are not of equal capacity, but are tapered to give a small minimum, increasing to within one-tenth of the full capacity on the last tap. Condenser is mounted, baked and impregnated under vacuum so as to prevent leakage, thus assuring constant capacity values in use. Mounted on a bakelite panel 3-16" thick. Provided with bakelite covered binding posts and bakelite knob 1 1/2" in diameter. Phosphor bronze fan switch and contacts nickel plated and polished.

The New de Forest "VT" Audion

THIS tube is identical with the latest forms of tubes manufactured by the de Forest Radio Tel. & Tel. Co. for war work and is similar in shape to the VT-21 tube of which the de Forest Company made thousands for the Signal Corps during the war. In the United States its sale is restricted to amateurs and experimenters for reception only.



The tube consists of a highly evacuated vessel cylindrical, rather than bulbular, in shape enclosing the three elements, grid, plate and filament in the form of the old type T tubular de Forest tube with which amateurs are familiar. The plate is of nickel, cylindrical in shape, and surrounds a helical grid also of nickel. The filament is a crimped tungsten wire passing through the center of the grid exactly as it did in the old style "T" type de Forest tube.

The chief difference between this tube and the type T tube of similar mechanical construction is in its degree of evacuation. The old style type "T" was a very gaseous tube, very unstable in operation and requiring a variable "B" battery. It had the decided disadvantage that after continued use the tube would get "hard" and require more "B" battery until it reached such a state as to be inoperative. The new "VT" tube is exhausted to a very high vacuum, so that it will stand very high plate potentials. When used as a detector, however, a battery of 20 to 40 volts is sufficient to give the proper plate current, although voltages of 80 to 100 may be used without detrimental effect upon the tube. The "B" battery moreover, is not critical in adjustment and, therefore, a fixed battery may be used and is used for all practical work.

The filament takes from .7 to .8 amps. only, whereas the old type T tube required about double this amount. This is a decided advantage in that it saves charging of the storage batteries at short intervals. A 4 volt storage battery will light the filament, but a 6 volt battery with a control rheostat will give better results. The filament is of crimped tungsten and tests show that the majority of these tubes will burn from 1,000 to 2,000 hours.

The de Forest "VT" tube is provided with the standard 4-prong base to fit the receptacle on all recent types of de Forest apparatus as well as apparatus put out by other concerns. The base is provided with a pin which fits into a bayonet lock in the receptacle, so that the tube may be inserted or removed by merely a slight twist. The 4 prongs on the base are connected, 2 to the filament and 1 each to the grid and plate. These prongs mesh with springs in the bottom of the receptacle and in this way perfect connection is made to the receiving apparatus without the use of awkward flexible leads, binding posts, etc.

Amateurs are warned that the only tube available on the market at present is the de Forest "VT" tube above described. All other tubes advertising an outside plate or outside grid are humbugs sold to get around the de Forest patents and are absolutely worthless from an operative point of view.

De Forest "VT" Audion. Code word: Grammont. Price \$7.00 each.

Instructions for Using the De Forest Audion

These instructions apply to the new type high vacuum tube such as was used by the U. S. Army and Navy and is at present being manufactured by the Moorehead Company exclusively for the de Forest Company under the latter's patents. The old type gaseous tube with the candelabra base can

be used similarly, except that a variable "B" battery of from 20 to 50 volts is required. The gaseous type tubes are, however, no longer being manufactured.

The audion tube should not be inserted into its socket until the operator is definitely sure that the control rheostat is set at the point marked "Off" or with its full resistance in circuit.

A 6 volt storage battery should be connected to the binding posts on the audion panel marked "A Bat", making sure that the polarity is as indicated.

After the tube has been placed in the socket, turn the rheostat up slowly until the filament burns with the brilliancy of a tungsten lamp. Connect a fixed battery of from 20 to 60 volts into the plate circuit and in series with the telephone receivers. If then the grid circuit is connected in the usual way (by means of the binding posts "RA"—"RE" found on all de Forest apparatus) to the tuner, the audion should be operative and signals should be received as the circuits are tuned to the proper wave lengths.

Type R-300 Audion Tube Receptacle



A neat type of audion tube socket designed for mounting on the front of a panel or on a table top. It differs from our Type UR-100 mainly in that it is front as well as back connected. Instead of merely having connecting screws on the contact springs in the rear of a unit panel, screw connections are brought out through the bakelite base on front where they are readily accessible. It is designed to take the standard 4-prong base of the transmitting or receiving tubes on the market today.

Cat. No. R-300. Audion Tube Receptacle. Code word: Grainger. Shipping Weight $\frac{1}{2}$ lbs. Price \$1.50.

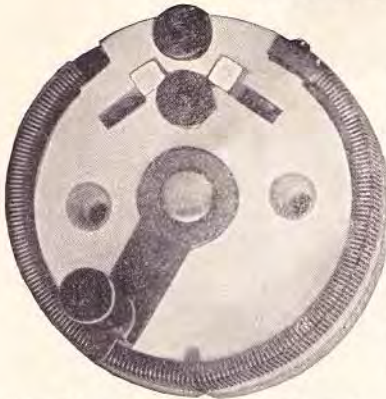
Type G-100 Variable or Fixed Grid Leak



A small device, the value of which is not fully appreciated by those who are not well advanced in radio. Consists of a very high resistance which, when shunted across the stopping condenser in an audion circuit, keeps the potential of the grid of such a value that paralyzation is prevented and most efficient results are obtained.

The grid leak here shown is of the pencil mark type and can be easily varied by means of an eraser and pencil. Connection is made to the pencil mark by two screws which go through holes in the panel and are held in place by two nuts. The complete leak is covered by a nickel plated brass cover, which is held in place with a bayonet lock. This leak is ideal for experimental audion circuits and can be made permanent in a receiving set by substituting ordinary india ink for the pencil mark.

Cat. No. G-100. Code word: Grein. Shipping Weight, $\frac{1}{2}$ lb. Price, ready to mount on panel, \$0.75.

F-200 Reversible 6-Ohm Filament Rheostat

A new type of filament rheostat for use with the VT type tubes when connected to a 6 volt storage battery. It is made up similarly to the old well-known 11 ohm porcelain type but has many advantages over the latter. It is smaller in diameter and is reversible so that it may be mounted either on the front or back of a panel in less space. Its resistance is but 6 ohms, which is sufficient and provides a much even, smoother and more critical adjustment than the 11 ohm type.

Cat. No. F-200. Reversible 6 ohms Filament Rheostat. Code word: Quain. Shipping Weight $1\frac{1}{2}$ lbs. Price \$1.00.

Type DB-100 Telephone Distributing Block

An accessory which will be appreciated by those who wish to use several pairs of telephone receivers in series or who wish to add a loud-speaking receiver to their present equipment. Consists of a bakelite strip on which are mounted three standard telephone jacks and two pairs of bakelite covered binding posts connected in series.



To one pair of binding posts is connected a cord and plug with which the distributing block is connected to the control panel, or amplifier. The other pair of binding posts is supplied with a short circuiting strap which may be removed when it is desired to connect a loud-speaking receiver permanently in the circuit.

The telephone jacks are connected in series with the binding posts, so that from one to three people may listen in at the same time in addition to the loud speaker which may be short circuited if desired, by means of the strap. On the removal of the plug attached to a pair of head telephones the circuit is automatically and instantly closed by means of the spring contacts in the Jack so that the reception is not interrupted in the least. The Bakelite block and jacks are mounted in handsome oak case, and screw holes are provided so that the device may be mounted on the side of a tuner or screwed to the operating table top.

Cat. No. DB-100. Telephone Distributing Block with Case, Cord and Plug. Code word: Rodwell. Shipping Weight 7 lbs. Price \$13.00.

Type R-400. Inverted Moulded Tube Receptacle

This is a beautiful tube receptacle of the moulded type suitable for mounting on panels where it is desired to use the tubes in the inverted position. The contact springs are provided with flexible leads which pass through the stem for connection in the back of the panel. It has a handsome black polished finish which adds greatly to any receiving set or control panel. It is desired to take the standard four prong receiving tube base.

Cat. No. R-400. Inverted Moulded Tube Receptacle. Code word: Scammon. Shipping Weight 1 lb. Price \$2.40.

The de Forest Unit Receiving Set



A 15 Panel Cabinet type typical de Forest Unit Receiving Set. Wave length range of tuner 150 to 25,000 meters. Includes a Crystal, Audion Detector and One-Step Amplifier.

THE de Forest Unit Receiving Set is a distinctly original idea in receiving apparatus for experimenters, students, amateurs and others, who desire to put their apparatus together in their own way. It is offered as a solution to the problems of the many who, though limited in means, wish to buy accurately designed, up-to-date and efficient apparatus and use their ingenuity in its assembly without having to pay

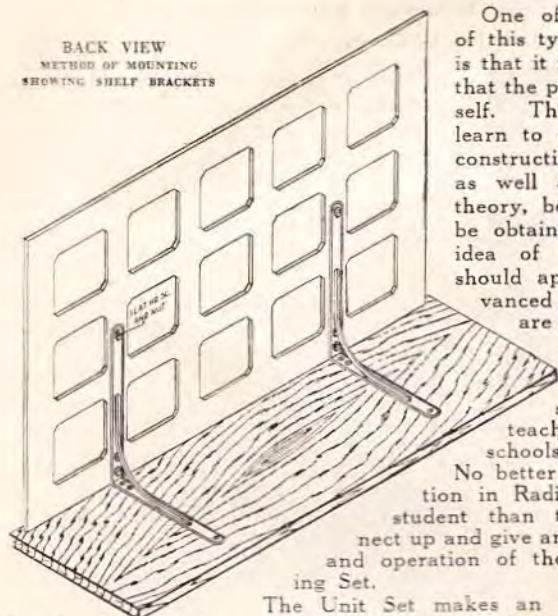
for the expensive assembly and costly cabinets without which such apparatus could not be bought in the past.

Every part of the Unit Set is designed from engineering data and is built and insulated with the best materials available—materials identical with those used in our large expensive sets, so that the Units are not to be classed as toys but as absolutely reliable radio apparatus. Our idea in design is not to furnish a lot of cheap junk parts of miscellaneous sizes that are obsolete in a few months but to provide good standard units, uniform in size, that may be added from time to time to increase the capabilities and efficiency of the set. Each unit is the design of a radio engineer and is not thrown together by a mere mechanic or experimenter. The parts are efficiently built for long-distance reception by the highest skilled instrument-makers we can obtain so that the purchaser is assured of the same famous "De Forest Workmanship" throughout this type of apparatus as that furnished with our larger sets that have caused such favorable comment and made so many friends for us.

The set consists of parts and controls, each one of which is mounted on a small Bakelite panel $4\frac{1}{2}$ " square and 3-16" thick. These panels are provided with holes in the four corners for screwing to a latticed or cut-out back-board of wood or preferably of a wall-board such as Compo-Board. In order to make up a complete panel receiver of the Unit type, it is only necessary for the purchaser to cut holes 4" square in the back-board, mount the Units over these holes and connect the apparatus together in the back of the panel using any circuit he may prefer. The wiring is simplicity itself as each unit is provided with connecting screws and a troublesome soldering-iron is not necessary. The connecting screw feature will be appreciated also when it is desired to change the circuit to meet new requirements or for any particular test.

The amateur with limited means may start by purchasing a coil, crystal detector and condenser. These connected together will form a receiver to which he may add at a later date, other coils and condensers to make his original set more selective and efficient. It can be readily seen that this feature of the Unit Set is extremely valuable to the amateur in that he, instead of discarding the apparatus that he previously bought, adds to it to produce better and more efficient results. This obviates the necessity of buying small cheap tuners and other apparatus to which alone the amateur has had access previously and provides him with parts of the highest quality only. This expansion idea produces a receiving set which is entirely flexible in use and should last a life-time throughout which it can be adapted, by the addition of other devices, to all improvements in the art of radio telegraphy and telephony.

BACK VIEW
METHOD OF MOUNTING
SHOWING SHELF BRACKETS



One of the greatest advantages of this type of receiving apparatus is that it is decidedly educational in that the purchaser must wire it himself. This requires that he must learn to understand completely its constructional details and operation as well as a certain amount of theory, before the best results can be obtained. For this reason the idea of the Unit Receiving Set should appeal strongly to the advanced amateur and to those who are doing experimental work.

It should have unlimited use and advantages in institutions of learning and should appeal also to teachers of Physics in all schools throughout the country. No better problem for an examination in Radio could be given to the student than to require him to connect up and give an explanation of the theory and operation of the de Forest Unit Receiving Set.

The Unit Set makes an ideal piece of apparatus for the Radio Laboratory as its flexible method of connection allows the different units to be used in any way desired. It may be connected easily and quickly as a wave-meter, inductance or capacity bridge, undamped wave generator or any other testing set and when calibrated should hold its adjustment accurately.

For mounting, $\frac{1}{2}$ " white-wood makes an excellent back-board though it is harder to work than the thinner wall-board. Wall-board is satisfactory in every way provided a board having a wood-ribbing or similar filler is used. The board need not necessarily be a perfect insulator as all parts are insulated from it by the bake-lite panels on which they are mounted. The back-board should be fastened on a suitable base by means of a pair of shelf brackets. The 4" holes should be cut with their edges $1\frac{1}{2}$ " apart. The units should be mounted with 4 machine screws, nuts and washers. As a further step towards finish, the set may be enclosed in a box, cabinet or other dust-proof housing though this is not absolutely necessary. We give the following detailed descriptions of the standard panels necessary for Unit Sets:

Single Inductance Coil Mounting Unit No. ULC-200

Single plug receptacle mounted on a unit panel to hold one honeycomb coil. Can be used to hold the tuning coil for direct coupled set, or the loading coil, Wave-meter coil, etc. Connecting screws are provided on rear of the panel.

Cat. No. ULC-200. Single Inductance Coil Mounting on Unit Panel. Code word: Grote. Shipping Weight $1\frac{1}{2}$ lbs. Price \$1.90.

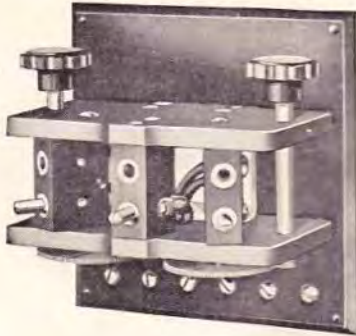
Double Inductance Coil Mounting Unit No. ULC-300

A mounting for two honeycomb coils. Consists of a brass angle piece holding two receptacles which move on bearings so that the coupling between the coils inserted in them can be changed at will. Brass angle piece is nicked. Receptacles are of bakelite. The whole is mounted on a unit panel and the plugs are connected to four binding screws by heavy Litz, covered by superfibre tubing.

Cat. No. ULC-300. Code word: Guest. Shipping Weight 2 lbs. Price \$4.30.

Adjustable Triple Inductance Coil Mounting

Unit No. ULC-100



Unit set style of our Type LC-100 Coil Mounting described in detail on page four. For the unit set, this differs from the description there given in that it is mounted on a standard unit panel of bakelite and is provided with six connecting screws on the back of the panel instead of with binding posts and base.

Cat. No. ULC-100, Type LC-100. Inductance Coil Mounting on Unit Panel. Code word: Halifax. Shipping Weight 3 lbs. Price \$10.00

Triple Inductance Coil Mounting

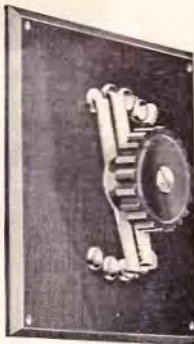
Unit No. ULC-400

This is identical with our type ULC-300 mounting except that it is equipped with receptacles for three Honeycomb Coils instead of two. It should not be confused with our No. ULC-100 three coil mounting, as this is a very different type of instrument provided with gears and pinions for close adjustments of coupling.

Cat. No. ULC-400. Code word: Hampole. Shipping Wt. 3 lbs. Price \$5.30.

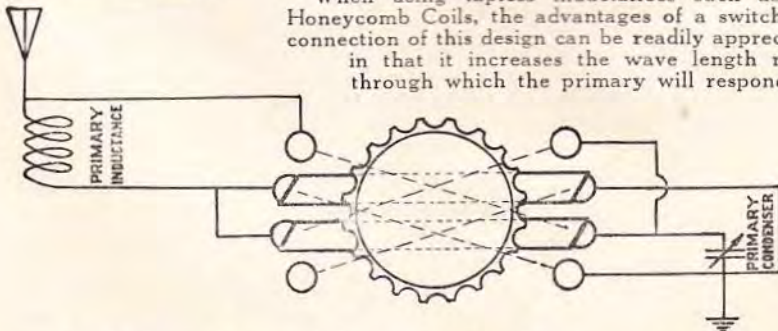
Primary Condenser or Variometer Switch

Unit No. US-100



A double switch comprising two switch arms and eight contact points, designed for switching the primary condenser (or variometer) from a series to a parallel connection so that the primary condenser for the usual size for short wave work will still be of use on the very long waves. The following circuit diagram shows its connection with respect to the primary inductance, aerial and ground, and it will be seen that when the switch is in its central position, the condenser is short circuited so that the circuit consists of the primary inductance only. When the switch is turned to the left the condenser is in series with the primary inductance and when turned to the right it is brought in parallel with the primary inductance.

When using tapless inductances such as our Honeycomb Coils, the advantages of a switch and connection of this design can be readily appreciated in that it increases the wave length range through which the primary will respond.

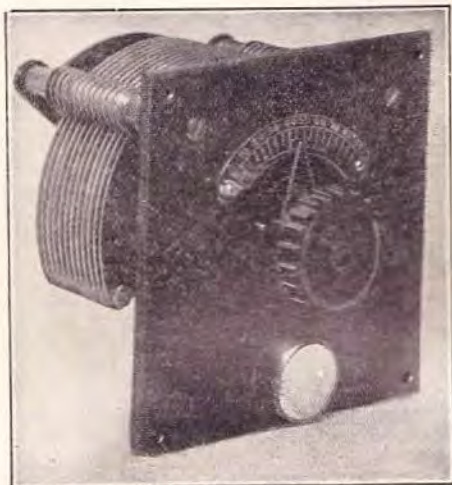


Switch is made up of laminated phosphor bronze contact springs fastened to our standard $1\frac{1}{2}$ " bakelite knob. The ends of these springs

are turned over at an angle so as to give a clean wiping contact that is always positive. Contact springs and contact points are nickel plated, and the latter are furnished with connecting nuts and washers in the rear of the panel.

Cat. No. US-100. Primary Condenser Switch for Unit Set. Code word: Hardy.
Shipping Weight 1 lb. Price \$2.40.

Variable Air Condenser on Unit Panel
With or Without Grid Leak



Standard Type CV-500, 900 Variable Air Condenser Mounted on Unit Panel. Full description of the desirable features of this condenser may be found on page six. Capacity approximately .0005 microfarads which is sufficient, when used across the secondary of the tuner, for working on all wave lengths with our Honeycomb Coils, but owing to the small capacity, the tuning range is less than when our Catalog No. UCV-1000 Condenser is used, and it will therefore require more Honeycomb Coils to cover the complete range of wave lengths. Standard connecting screws are furnished.

The illustration shows our Type G-100 grid leak connected across the condenser mounted on the face of the panel with knob, scale and pointer. In this location, grid leak is decidedly accessible and easily varied by using a lead pencil to suit any vacuum tube to the particular constants of the circuit. Condenser is of sufficient capacity to cover the ranges of long wave lengths, and with its low minimum capacity value, is well designed for use on shorter wave lengths. Furnished also without grid leak.

Cat. No. U-100. Grid Condenser and Leak for Unit Set. Code word: Horman.
Shipping Weight 3 lbs. Price \$7.50.

Cat. No. UCV-500. Secondary Variable Air Condenser for Unit Set. Code word: Hocleve. Shipping Weight 3 lbs. Price \$6.75.

Master Anti-Capacity Key Switch
Unit No. US-200

Our Type S-200 anti-capacity four pole double throw key switch mounted on a unit panel. Constructional details fully described on page five. Ideal for switching the receiving set from crystal to audion detector reception as well as for short circuiting the tickler coil, changing from audion to ultraudion connection, etc. Unlike Type S-200, it is provided with connecting screws on the back of the panel.

Cat. No. US-200. Master Anti-Capacity Key Switch on Unit Panel. Code word: Ingelow. Shipping Weight 3 lbs. Price \$4.00.

Unit Type Vernier Air Condensers
Unit No. UCV-1500 and UCV-1000

Standard CV-1500 and CV-1000 Vernier air condensers described elsewhere in our catalog mounted on a panel for use as a primary and secondary condenser in the unit set. The primary condenser has a capacity of .0015 microfarads, giving a wide range of wave lengths with our Type L Honeycomb Inductance Coils. When used with our Type US-100 Primary Condenser Switch, a very wide tuning range is provided for the primary circuit, as by means of this switch the primary condenser may be thrown either in series with, or in parallel to the primary inductance.

The secondary condensers have a capacity of .001 microfarads, which is ample for all wave length ranges.

Code word: Hawthorne. Cat. No. UCV-1500 .0015 Mfd. Variable Air Condenser on Unit Panel without Vernier attachment.....	\$14.90
Code word: Henfrey. Cat. No. UCV-1503 .0015 Mfd. Variable Air Condenser on Unit Panel with Vernier attachment.....	16.75
Code word: Herschel. Cat. No. UCV-1000 .001 Mfd. Variable Air Condenser on Unit Panel without Vernier attachment.....	13.60
Code word: Holland. Cat. No. UCV-1003 .001 Mfd. Variable Air Condenser on Unit Panel with Vernier attachment.....	15.50

"A" Battery Switch and Telephone Jack Panel

Panel provided with small pull switch and telephone jack for plugging in receiving telephones. Switch of a novel form occupying a minimum of panel space and excellent for making and breaking the "A" battery and other circuits. Absolutely positive in action and assures a good contact for carrying capacities up to ten amperes. Telephone jack of the standard type equipped with contacts to work the same as a double-pole double-throw switch when operated by plug on telephone cord. This plug and jack method of connection for receiving telephones is ideal when similar jacks are used in the amplifier to which the receiving set is connected. The telephones may be instantly switched from the detector to the amplifier circuit for better audibility in case the received signal on detector set is too weak for working. Switch and jack end are nickel plated, giving the panel a highly pleasing finish. Connecting screws are provided for both switch and telephone jack terminals.

Cat. No. U-200. Code word: Kemble. Shipping Weight 2 lbs. Price \$2.95.

"A" Battery Switch and Telephone Binding Post Panel

Unit the same as our U-200 except that the telephone jack is replaced by two bakelite covered binding posts for connection to the receiving telephones. The binding posts are drilled to receive the cord tips and connecting screws are provided on the back of the panel.

Cat. No. U-300 Code word: Kilian. Shipping Weight 1 lbs. Price \$2.00.

Cat. No. J-100. Telephone Plug for Jack. Code word: Prideaux. Shipping Weight 1/2 lbs. Price \$1.10.

Crystal Detector
Unit No. UD-100



Type D-100 crystal detector mounted on a unit panel. Described in detail elsewhere in our catalog. Furnished in unit form complete with tested galena crystal and connecting screws.

Cat. No. UD-100. Detector Complete with Crystal on Unit Panel. Code word: Janvier. Shipping Weight 2 lbs. Price \$4.00.

Audion Tube Receptacle**Unit No. UR-100**

Receptacle designed for the standard four prong base detector or amplifier tube. Shell is of nicked brass and projects $\frac{3}{8}$ " through the face of the panel to provide clearance for the bayonet lock. Contact springs in the rear of the socket are of nickel plated phosphor bronze, mounted on a $\frac{3}{8}$ " composition ring to which the brass socket is fastened. The whole is mounted on the panel by means of screws. Contact springs are separately marked with letters for the proper connections and are provided with connecting screws and washers.

Cat. No. UR-100. Audion Tube Receptacle on Unit Panel. Code word: Jerrold. Shipping Weight 2 lbs. Price \$2.95.

Loading or Bridging Condenser**Unit No. UCS-1500**

Unit panel on which is mounted Type CS-1502 Loading Condenser. Identical with Type CS-1502 except that the binding posts are replaced by two binding screws for connection on the back of the panel and no cabinet is provided. This unit will be found ideal for either increasing the capacity of a variable air condenser or for shunting the telephones in the usual crystal detector circuit.

Cat. No. UCS-1500. Loading or Bridging Condenser for Unit Set. Code word: Inchbald. Shipping Weight 2 lbs. Price \$5.75.

Tickler or Audion-Ultraudion Three Point Switch**Unit No. US-400**

A small three point switch mounted on a unit panel to be used for short circuiting the tickler coil of the tuner, switching from an audion to an ultraudion circuit, or for any other purpose where a three point switch is necessary. Switch arm of laminated phosphor bronze with its ends turned over to give a clean wiping contact on the three contact points. Pig-tailing to the shaft is dispensed with by making the rear end of the switch arm in the shape of a fork which is turned over to wipe on the bushing in the panel, and thereby obtain a perfect contact. The parts are of brass, nickel plated.



Cat. No. US-400. Code word: Junius. Shipping Weight $1\frac{1}{2}$ lbs. Price \$2.20.

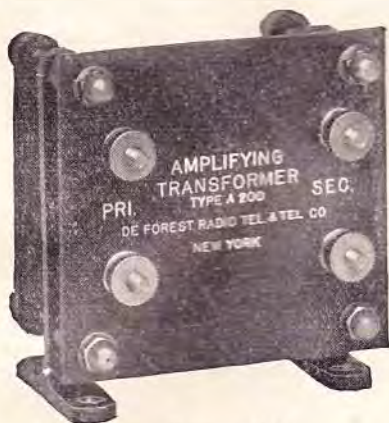
Filament Battery Rheostat**Unit No. UF-200**

Our new type F-200 filament rheostat mounted on a unit panel. Panel engraved with the word "OFF" to show when the filament circuit of the tube is open. Supplied with bakelite $1\frac{1}{2}$ " knob and pointer, giving the panel a highly finished appearance fully in keeping with the other units of the de Forest Unit Set.

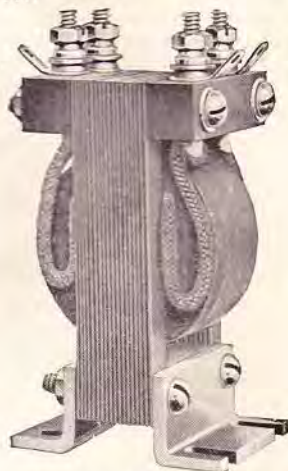
Cat. No. UF-200. Filament Battery Rheostat on Unit Panel. Code word: Jortin. Shipping Weight 2 lbs. Price \$3.80.

Additional Unmounted Units

The following unmounted parts are furnished to complete the Unit Set idea and make it applicable to all receiving conditions. These parts require no controls and are therefore not mounted on unit panels. They are to be wired in place on the baseboard of the set:—



Type A-200



Type A-300

Type A-200 Iron Core Amplifying Transformer

This transformer has been provided to replace our type A-100 air core transformer which, though of the same efficiency, has been found to be mechanically imperfect. It is an audio-frequency amplifying transformer of the very greatest electrical and mechanical efficiency. The windings are designed for a minimum of d.c. resistance with a high impedance. It has a 12-1 impedance ratio, and the secondary impedance approaches as nearly as possible the grid impedance of the amplifying tube. The energy or audibility amplification is from 10 to 16 times per transformer, so that a two-step amplifier employing transformers of this design will increase the signal strength from 100 to 250 times.

The coils are highly insulated with impregnated paper between layers, and are mounted on an iron core held rigidly together by means of bolts through aluminum frames. The frames are provided with legs and screw holes for attaching the instrument.

Cat. No. A-200. Code word: Lancet. Shipping Weight 3 lbs. Price \$7.00.

Type A-300 Amplifying Transformer

This smaller type is slightly different from type A-200. It is identical in operating characteristics with the A-200 except that the impedance ratio between primary and secondary is but three to one. It is an excellent transformer for use with the de Forest VT Audion.

Cat. No. A-300. Code word: Larcom. Shipping Weight 3 lbs. Price \$7.10.

Type CF-2000 Telephone Condenser

Fixed condenser designed for shunting the telephone receivers when used with a crystal detector. Consists of a mica condenser of .002 microfarads capacity, clamped between heavy brass plates. The whole is dipped in a moisture proof compound. Leads are provided for connection.

Cat. No. CF-2000. Code word: Wolston. Shipping Weight 1 lb. Price \$0.90.

High Voltage Dry Battery

"B" battery of 20 volts cast en bloc. Provided with 2 leads which are connected by clips. Unnecessary to use a soldering iron. These batteries are identical to those used in our types P-100, P-200, etc. Operating life approximately 2,000 hours.

Cat. No. 766. Code word: Preble. Shipping Weight 10 lbs. Price \$3.00.

Typical De Forest Unit Receiving Sets

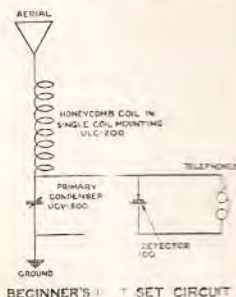
The following Unit Sets are suggested for the selection of the purchaser. The tabulated costs cover everything required with the exception of the batteries, telephone receivers and audion tubes.

A list of Honeycomb Coils is given in each case with the wave length ranges to which they will respond. Coils other than those listed may be added to increase the ranges of the sets. The coils given are those which will bring in signals from stations which are most often heard when the set is used with the average amateur aerial. These lists are given that the purchaser may pick out coils to cover any particular ranges of wavelengths he may care to listen in on.

If it is the intention of the purchaser to make up a unit type amplifier to go with the set at a later date, our U-200 "A" Battery Switch and Telephone Jack Unit should be ordered in each case, instead of the U-300 "A" Battery Switch and Telephone Binding Posts listed. This will provide a plug connection for the telephone receivers and allow of transferring them to the amplifier jack without loss of time.

**Beginners Unit Set
of 3 Panels**

This is a small and inexpensive set for the beginner in radio. As it is equipped with a crystal detector it will respond to spark signals only. The coils listed are for signals from the spark stations in constant operation at present. This set has the advantage that no batteries are required.



Cost of Units

1 No. ULC-200	Single Coil Mounting	\$1.90
1 No. UD-100	Crystal Detector	4.00
1 No. UCV-500	Variable Air Condenser	6.75
	Total	\$12.65

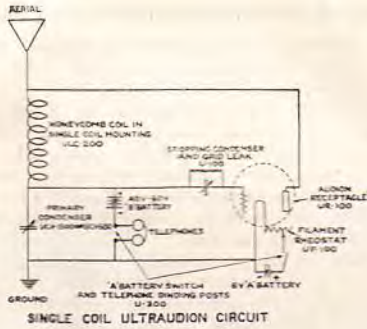
Honeycomb Coils Suggested for Beginners Unit Set

One Each of Nos. L-35, 100, 200, and 400. Total Cost \$7.30

Type of Service	Coil Cat. No.	Wavelength Range (Meters)	Price
Amateur	L-35	145-280	\$1.45
Commercial and Ship	L-100	430-790	1.70
Navy	L-200	845-1570	1.90
Arlington Time	L-400	1850-3300	2.25

**Single Coil Ultraudion Unit Set
of 6 Panels**

This set is inexpensive, very efficient, simple to adjust and fairly selective. It is a remarkably stable oscillator and therefore good for undamped wave reception. The variable grid condenser and leak provide good control of the oscillations so that a regenerative effect on spark signals may be obtained without destroying their tone value. It is recommended that the UCV-1500 Condenser be used instead of the UCV-500. The larger capacity gives a control decidedly worth the difference in the cost. The addition of an Amplifier will greatly increase the receiving range of this set, but it is possible to read the foreign trans-Atlantic stations without it, when the set is connected to a proper aerial, well located.



SINGLE COIL ULTRAUDION CIRCUIT

Cost of Units

1 No.	ULC-200	Single Coil Mounting	\$1.90
1 No.	U-100	Stopping Condenser and Grid Leak	7.50
1 No.	UR-100	Audion Tube Receptacle	2.95
1 No.	UF-200	Filament Rheostat	3.80
1 No.	U-300	"A" Battery Switch and Telephone Binding Posts	2.00
1 No.	UCV-1500	Variable Air Condenser (Cap .0015 mfd.)....	8.15

Total \$33.05

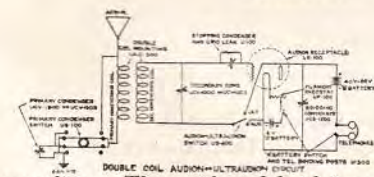
Honeycomb Coils Suggested for Ultra Audion Unit Set

One Each of Nos. L-35, 50, 100, 150, 200, 400, 500, 750, and 1500

Total Cost \$19.42

Type of Service	Wavelength Range (Meters)	Coil Cat. No.	Price
Amateur	145-350	L-35	\$1.45
Special Amateur	220-500	L-50	1.52
Commercial and Ship	430-1010	L-100	1.70
Navy Calling	635-1485	L-150	1.80
Navy Operating	845-1970	L-200	1.90
Arlington Time	1850-4300	L-400	2.25
Navy Ship Arcs	2500-5800	L-500	2.40
Navy Station Arcs	4500-10500	L-750	2.80
Foreign and Press	7375-17300	L-1500	3.60

Double Coil Unit Set of 10 Panels



DOUBLE COIL AUDION-ULTRAUDION CIRCUIT

This excellent combination of apparatus constitutes a set of great flexibility, control, selectivity and sensitivity. The circuit is adaptable equally well to either spark or arc signals because of the audion-ultraudion switch, and good selectivity is obtained by means of the primary and secondary coupling. The grid and bridging condensers provide excellent control of its oscillating or regenerating ability. With a good aerial well located, this set will respond to the trans-Atlantic long wave stations. It is an all-around receiver of the very best type. The addition of our P-200 two-step Amplifier and loud-speaking horn makes it possible to hear the signals all over the operating room.

Cost of Units

1 No.	ULC-300	Double Coil Mounting	\$4.30
1 No.	US-100	Primary Condenser Switch	2.40
1 No.	UCV-1500	Primary Variable Air Condenser	14.90
1 No.	UCV-1000	Secondary Air Condenser	13.60
1 No.	U-100	Stopping Condenser and Grid Leak	7.50
1 No.	US-400	Audion-Ultraudion Switch	2.20
1 No.	UR-100	Audion Tube Receptacle	2.95
1 No.	UF-200	Filament Rheostat	3.80
1 No.	U-300	"A" Battery Switch and Telephone Bind. Posts.	2.00
1 No.	UCS-1500	Bridging Condenser	5.75

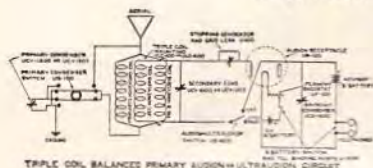
Total \$59.40

To obtain the best arrangement for zero-beat and radio telephone reception, it is suggested that Vernier Type Condensers be used instead of those listed for the Primary and Secondary. The list should then be altered, substituting UCV-1003 condensers, and UCV-1503 condensers, increasing the cost of Set to..... \$63.15

Honeycomb Coils Suggested for Double Coil Unit Set
One Each of Nos. L-25, 35, 75, 100, 200, 250, 300, 500, 600 and 1000
Total Cost \$24.90

Type of Service	Wavelength Range (Meters)	Pri. Coil Cat. No.	Price	Sec. Coil Cat. No.	Price	Primary Cond. Connection
Amateur	180-325	L-35	\$1.45	L-25	\$1.40	Series
Commercial	525-710	L-100	1.70	L-75	1.60	Series
Navy Calling	900-1350	L-200	1.90	L-100	1.70	Series
Arlington Time	1420-3350	L-300	2.10	L-250	2.00	Series
Foreign and Press	7600-11900	L-500	2.40	L-1000	3.00	Shunt
Foreign and Press	10500-16800	L-600	2.65	L-1000	3.00	Shunt

Triple Coil Unit Set of 10 Panels



This Unit Set comprises the new differential primary circuit and the Audion-Ultraudion secondary of the Double Coil Set. It is the last word in sensitiveness, flexibility of control and selectivity on undamped waves. The balanced primary with the field of one coil opposing the other makes the circuit remarkably anti-static and ultra-selective.

The tuning therefore is very sharp and the energy is impressed upon the grid with practically no losses due to dissonance. The tuning, though not difficult is decidedly interesting and many peculiar and remarkable results may be obtained. The addition of a one or two-step or P-200 type amplifier completes a set for any wave length that cannot be surpassed for amateur or experimental use.

Cost of Units

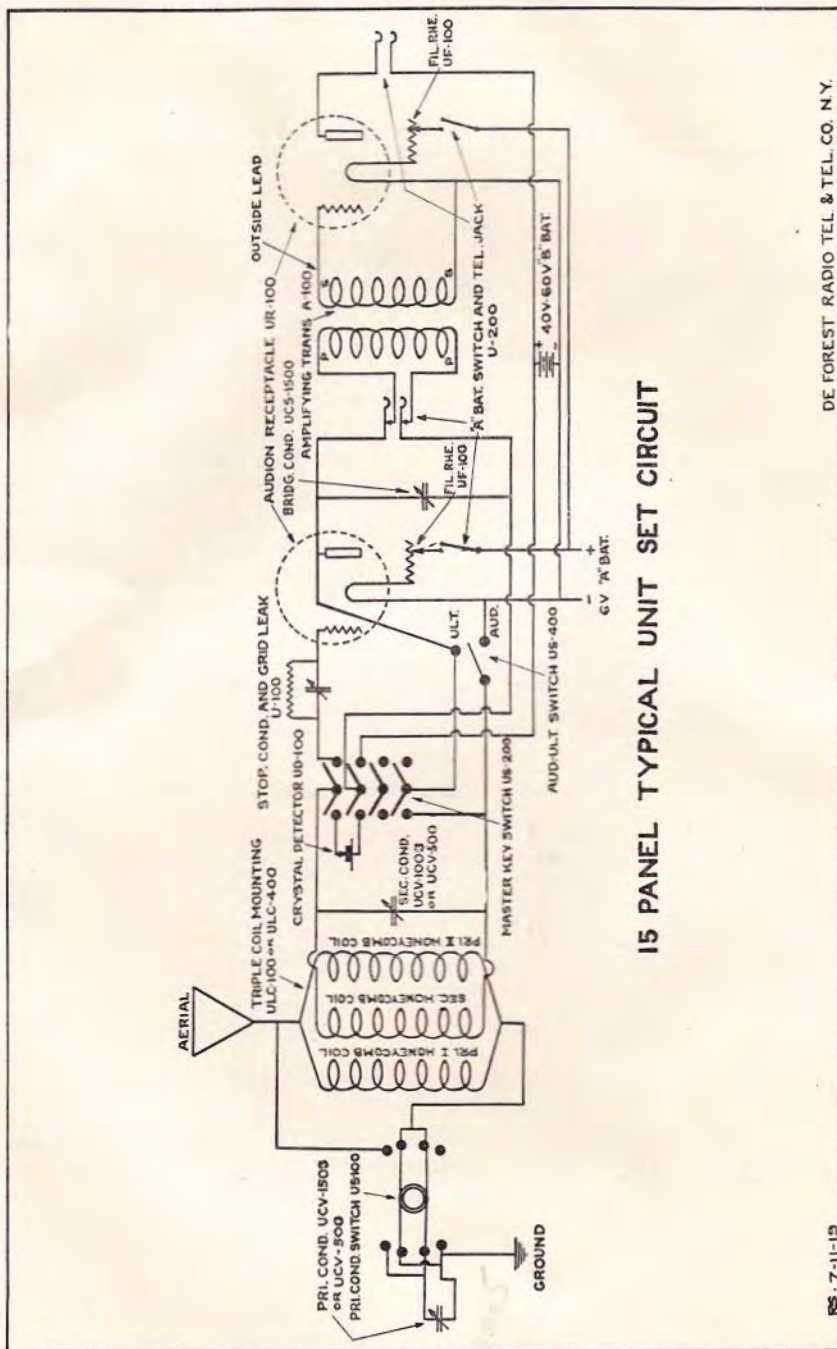
1 No. ULC-100	Adjustable Triple Coil Mounting	\$10.00
1 No. US-100	Primary Condenser Switch	2.40
1 No. UCV-1503	Primary Vernier Air Condenser	16.75
1 No. UCV-1003	Secondary Vernier Air Condenser	15.50
1 No. U-100	Stopping Condenser and Grid Leak	7.50
1 No. US-400	Audion-Ultraudion Switch	2.20
1 No. UR-100	Audion Tube Receptacle	2.95
1 No. UF-200	Filament Rheostat	3.80
1 No. U-300	"A" Battery Switch and Tel. Bind. Posts.....	2.00
1 No. UCS-1500	Bridging Condenser	5.75
Total		\$68.85

HONEYCOMB COILS SUGGESTED FOR 10-PANEL TRIPLE COIL UNIT SET

(And for Typical 15 Panel Unit Set where Vernier Type Condensers are used).
One Each of L-25, 75, 600 and 1250, and Two Each of L-50, 150, 250, 500, 100, and 1500. Total Cost \$37.64

Type of Service	Wavelength Range (Meters)	Pri. Coil Cat. No.	Price	Sec. Coil Cat. No.	Price	Primary Cond. Connection
Amateur	150-350	2 L-50	3.04	L-25	1.40	Series
Commercial	450-1050	2 L-150	3.60	L-75	1.60	Series
Navy Calling	835-1950	2 L-250	4.00	L-150	1.80	Series
Arlington Time	1760-4100	2 L-500	4.80	L-250	2.00	Series
Foreign & Press	5200-12500	2 L-1500	7.20	L-600	2.65	Series
Foreign & Press	12000-20000	2 L-1000	6.00	L-1250	3.35	Shunt

The coils recommended in the above tables cover the wave-lengths most used. Other coils should be obtained to cover the wave-length ranges not shown.



15 PANEL TYPICAL UNIT SET CIRCUIT

DE FOREST RADIO TEL & TEL. CO. N. Y.

RS. 7-11-15

Triple Coil Unit Set of 15 Panels

The typical 15 Panel Set illustrated elsewhere, comprises a triple-coil tuner with a wave-length range of 150-25,000 meters, crystal and audion detector and a one-step amplifier. It is the same as our Triple Coil 10 Panel Unit Set with the addition of a crystal detector and one step amplifier. If desired, further steps of amplification may be added at \$16.70 each to make this set even more sensitive than it is as shown.

The front view illustration shows a set using two of Vernier Type condensers while the rear view cut illustrates the use of the small UCV-500 type tuning condensers:

COST OF UNITS

		Article	Price
1 No.	ULC-100	Triple Adjustable Coil Mounting	\$10.00
1 No.	US-100	Primary Condenser Switch	2.40
2 No.	UCV-500	Variable Condensers (for Pri. & Sec.) @ \$6.75	13.50
1 No.	US-200	Master Anticapacity Key Switch	4.00
1 No.	U-100	Variable Grid Condenser and Leak.....	7.50
2 No.	UR-100	Audion Tube Receptacles @ \$2.95.....	5.90
2 No.	UF-200	Filament Rheostats @ \$3.80.....	7.60
1 No.	UCS-1500	Bridging Condenser	5.75
1 No.	US-400	Audion-Ultraudion Switch	2.20
1 No.	UD-100	Crystal Detector	4.00
2 No.	U-200	"A" Battery Switch and Tel. Jack @ \$2.95..	5.90
1 No.	J-100	Telephone Plug for Jacks	1.10
1 No.	A-200	Amplifying Transformer	7.00
2 No.	766	"B" Battery Units, 20 v. each, @ \$3.00.....	6.00
			<u>\$82.85</u>
2 de Forest "VT" Audions @ \$7.00.....			14.00
Total			<u>\$96.85</u>

For the most efficient, selective and flexible set of this type, we recommend that for the two small UCV-500 tuning condensers listed above, two of our Vernier Type Condensers, namely:

- 1 UCV-1503 Variable Air Condenser with Vernier for Primary
 1 UCV-1003 Variable Air Condenser with Vernier for Secondary

be substituted at cost of 18.75
 additional, making a total of \$115.60

HONEYCOMB COILS SUGGESTED FOR 15 PANEL TRIPLE COIL SET

(When UCV-500 Condensers are used in Primary and Secondary.)

One Each of L-25, 100, and 1500; and Two Each of L-50, 75, 150, 200, 250, 300, 500, 750, and 1000. Total Cost \$44.94

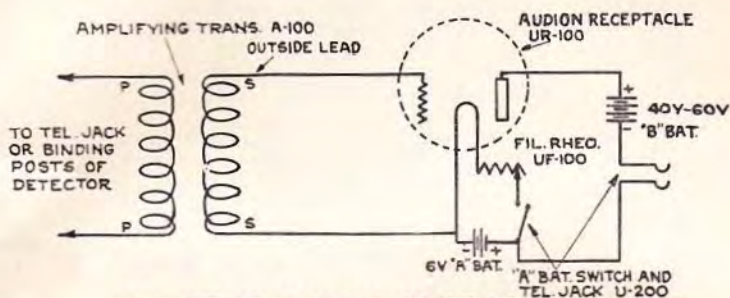
Type of Service	Wavelength Range (Meters)	Pri. Coil Cat. No.	Price	Sec. Coil Cat. No.	Price	Primary Cond. Con- vention
Amateur	150-275	2 L-50	\$3.04	L-25	\$1.40	Series
Special Amateur	230-395	2 L-75	3.20	L-50	1.52	Series
Commercial	450-730	2 L-150	3.60	L-75	1.60	Series
Commercial	580-1090	2 L-200	3.80	L-100	1.70	Series
Navy Calling	880-1530	2 L-250	4.00	L-150	1.80	Series
Navy Working	1160-1830	2 L-300	4.20	L-200	1.90	Series
Arlington Time	1760-3250	2 L-500	4.80	L-300	2.10	Series
Foreign & Press	9700-12000	2 L-750	5.60	L-1000	3.00	Shunt
Foreign and Press	12000-15500	2 L-1000	6.00	L-1500	3.60	Shunt

IMPORTANT: The use of the larger Vernier Type Condensers reduces the number of coils required to those recommended for the Triple Coil, 10 Panel Unit Set described on the preceding pages.

UNIT TYPE AUDION AMPLIFIER OF 3 UNIT PANELS



A simple one-step amplifier of the most efficient type. Each step will amplify the signals in the detector set 10 times, so that by the addition of amplifiers, a loud speaking receiver may be used to make the signals audible all over the operating room and the usual head receivers may be dispensed with except for the very weakest signals. A 40 volt "B" battery is all that is required, though higher plate voltages will give greater amplifications.

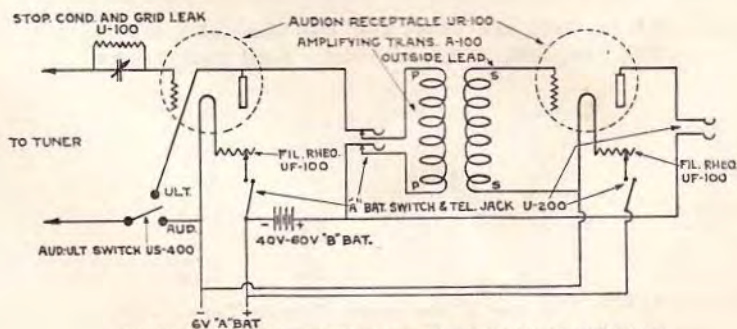


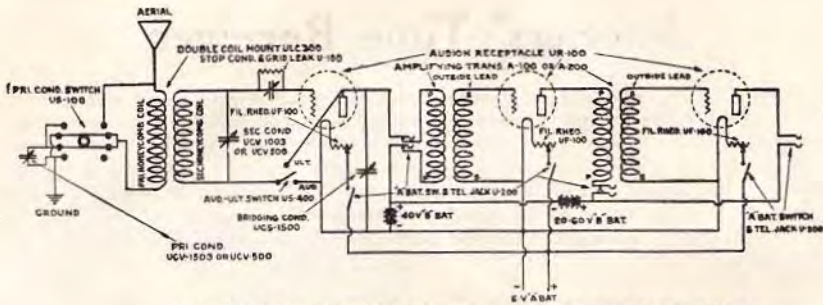
ONE STEP AUDION AMPLIFIER CIRCUIT

COST OF UNITS

1 No. UR-100	Audion Tube Receptacle	\$ 2.95
1 No. UF-200	Filament Rheostat	3.80
1 No. U-200	"A" Battery Switch and Telephone Jack.....	2.95
1 No. A-200	Amplifying Transformer	7.00
1 No. VT-	Amplifying Bulb	7.00
	Total	\$23.70

The same "A" and "B" batteries may be used for both the Amplifier and the Audion Detector if they are connected as follows:

COMBINATION AUDION AND AMPLIFIER CIRCUIT
USING THE SAME "A" & "B" BATTERIES



AUDION-ULTRAUDION DETECTOR & TWO STEP AMPLIFIER CIRCUIT
WITH
ONE "A" BAT. & TWO "B" BAT'S

Above is given a detector and two-step amplifier circuit in which part of the total "B" Battery in the plate circuit of the amplifiers is used for the plate of the detector. Instead of the arrangement shown, the negative wire from the amplifier plate battery may be permanently connected to the positive end of the detector battery and the lead from the detector telephone jack may be tapped to the number of cells of battery required by the detector tube.

Type LS-100. Loud Speaking Receiver



In the up-to-date radio station where amplifiers are employed, the Loud Speaker is fast becoming a necessity, and the use of head receivers is rapidly going out of style, except for the very weakest signals.

We present a loud speaker which, when used in connection with a two-step amplifier, will cause the signals to be heard all over the operating room. Experiments have shown that a loud signal on these receivers can be amplified to such an extent as to be unbearable to the ears when the head is placed within two or three feet of the horn.

For the reception of time signals from Arlington, a loud speaking receiver and two-step amplifier is an addition to the receiving set which is especially more than worth while to those who wish to allow several people to set their watches at the same time. Such an equipment has an exceptional commercial value to the jeweler since the time signals may be heard all over his store, and should produce an excellent advertisement for his business.

The Loud Speaker consists of a special telephone receiver capable of handling fairly large amounts of received current and of an impedance high enough to be inserted directly in the plate circuit of the amplifier or detector. The receiver is equipped with a special shell, bearing a threaded portion to which the horn is attached.

Cat. No. LS-100. Loud Speaking Receiver, with 20" or 24" bell or cone-shaped horn, as illustrated, six foot cord and plug ceiling or wall type,

Code word: Romilly. Shipping Weight 20 lbs. Price \$35.00

Jewelers' Time Receiver

A COMPLETE receiving set designed especially for jewelers and watch-makers, with three things in mind; efficiency, cost and simplicity in operation. The last feature should be a particularly valuable one for the jeweler who has no time to make adjustments and experiments in order to obtain results. The set, therefore, is provided with but one control, which when set to a given aerial need not to be changed, and signals from Arlington, Va., or any other time station should be received consistently day after day without further adjustment.

The set consists of a bakelite panel on which is mounted one of our type R-100 tube receptacles, type CV-500 variable 90 degree air condenser, one F-200 filament rheostat, G-100 grid leak, ULC-200 single coil mounting, a Honeycomb Coil of the proper size and binding posts for connection to the aerial and ground, storage battery for lighting the filament, telephone receivers, or a type P-200 two-step Amplifier and loud speaking horn. A 40 volt "B" battery consisting of two of our standard 20 volt units with their remarkably long life is included, so that when once set up, the receiver should require no attention for at least six months.



The whole outfit is enclosed in an oak cabinet with our handsome "Early English finish." Its small size of 9" x 9 $\frac{1}{8}$ " x 7 $\frac{3}{4}$ " takes up a minimum of counter space.

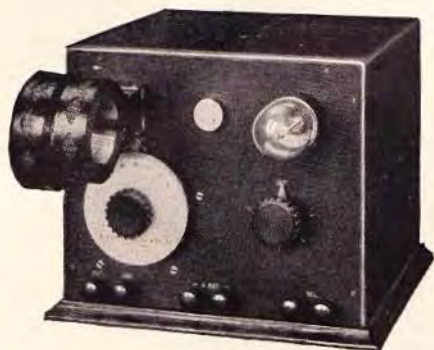
We believe the jeweler should welcome this set warmly, due principally to its simplicity which assures him of constant reception of the time signals after he has given up the expensive time service lease, upon which he is at present dependent for setting his clocks. This de Forest Jeweler's Receiving Set has the added advantage over the old style time leases, that absolutely the actual time may be obtained with it, whereas telegraph time signals are apt to be inaccurate, owing to mechanical lag in the apparatus, and personal errors in the setting of the master clocks.

The metal parts of the type RS-100 Receiver are of brass with a nickel polish. Against the black bakelite background, a decidedly pleasing appearance is provided which is worthy of a place on the counter of the most up-to-date and enterprising jewelry store. When the set is used in this way, from an advertising point of view, it is decidedly worth while. A greater and far better advertisement is obtained however, when our type P-200 two-step amplifier and loud speaking horn receiver is added to the set, so that time signals as well as signals from radio telegraph and telephone stations may be heard all over the store. An object of such general interest, it has been found, causes much favorable comment on the part of the public with the result that sales are increased and the store gains a reputation of being the most enterprising and up-to-date.

Cost No. RS-100. Jewelers Time Receiver without Tube and "A" Battery, but with "B" Battery and Coil. Code word: Moxon. Shipping Weight, 15 lbs. Price \$27.80.

Note: Our Type P-200 Amplifiers and Loud Speaking Receivers are described elsewhere in our catalog.

Utility Time Receiver



A complete receiving set, capable of receiving stations operating on any wave length between 100 and 25,000 meters.

It is a development of the Jewelers Time Receiver, which though designed primarily for time reception, was found to be extra sensitive on all wave-lengths and fully capable of receiving the Trans-Atlantic Stations when connected to a small aerial. The new RS-200 Receiver is an improvement of the latter, however, in that one of our CV-1500 Vernier Type Condensers and celluloid dial has

been substituted for the small CV-500 type of the Time Receiver. This larger condenser permits a considerable wave-length range with each honeycomb coil with correspondingly large over-laps which can not be obtained when the CV-500 is used. In other respects this new receiver is identical with the Type RS-100 with the exception of the size of panel and cabinet which has been increased slightly to accommodate the larger condenser.

Type RS-200. Utility Receiver, without tube and coils. Code word: Rainbow. Shipping Weight 15 lbs. Price \$45.00.

The Following Honeycomb Coils are Recommended for Use With the Above Instrument

One Each of Nos. L-35, 50, 100, 150, 200, 400, 500, 750, and 1500
Price \$19.42

Type of Service	Wavelength Range (Meters)	Coil Cat. No.	Price
Amateur	145-350	L-35	\$1.45
Special Amateur	220-500	L-50	1.52
Commercial and Ship	430-1010	L-100	1.70
Navy Calling	635-1485	L-150	1.80
Navy Operating	845-1970	L-200	1.90
Arlington Time	1850-4300	L-400	2.25
Navy Ship Arcs	2500-5800	L-500	2.40
Navy Station Arcs	4500-10500	L-750	2.80
Foreign and Press	7375-17300	L-1500	3.60

Racks for Honeycomb Coils



This is a small oak rack with a handsome de Forest "Early English" finish for holding 12 Honeycomb coils. It is an ideal accessory for the up-to-date radio station, and its use will be appreciated by those who at the present time find their unused coils cluttering up the operating table.

Cat. No. CR-100. Code word: Junius. Shipping Weight 3 lbs. Price \$3.50.



Type P-402



Type P-500

Types P-400 and P-401 differ from P-402 only in size of panel and depth of cabinet. P-401 is designed for external "B" battery, and two extra binding posts are provided for that purpose. P-400 is the same as P-401 but is furnished WITHOUT cabinet. See general specifications.

de Forest Audion Panels

Series P-400, P-401, P-402, P-500

THESE remarkably efficient and handsome audion control panels are without doubt better in every respect and lower in price than anything of a similar nature on the market today. They are within the price limit of every amateur. These control panels do not give one the cheap and thrown-together effect of those usually offered, because they are built with the same grade of workmanship and materials employed in our more expensive apparatus.

GENERAL SPECIFICATIONS, ALL MODELS: Beautifully engraved and grained genuine bakelite panels; 4 prong heavy nickeled tube receptacles; smooth running, positive acting, adjustable rheostats; impregnated efficient mica stopping condensers; adjustable or fixed grid leaks with polished nickel covers; bakelite covered binding posts with new slotted positive connecting feature; positive segmentally connected nickel plated switches; 40 volt "B" battery of two 20 volt type units cast en bloc with operating life of 6 to 12 months—a remarkable advance in "B" batteries. de Forest "Early English" finish; perfect workmanship and expensive design throughout.

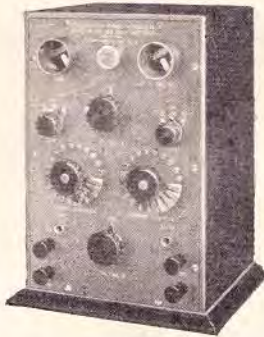
Type P-400. Audion Panel. Code word: Mascart. Shipping Weight 6 lbs. Consists of tube receptacle, grid leak and condenser, rheostat and binding posts for connection to tuner, "A" and "B" batteries on bakelite panel $7\frac{1}{4} \times 5\frac{7}{8} \times 1\frac{1}{4}$ " without cabinet and "B" batteries. Price, \$10.90.

Type P-401. Audion Panel. Code word: Melmoth. Shipping Weight 7 lbs. Same as above with cabinet. Price, \$13.25.

Type P-402. Audion Panel. Code word: Merrick. Shipping Weight 13 lbs. Larger panel with 40-volt "B" battery in cabinet $7\frac{1}{2} \times 7\frac{1}{8}$ ". Price, \$21.00.

Type P-500. Audion-Ultraudion Panel. Code word: Minchin. Shipping Weight 13 lbs. Type P-402, panel with two switches for audion-ultraudion connection and either 20 or 40-volt "B" battery in cabinet $7\frac{1}{2} \times 7\frac{1}{8}$ ". Price, \$24.00.

NOTE: All de Forest audion apparatus is sold without the tubes. Audion detector oscillator or amplifier tubes, \$7.00 each additional.



Type P-300



Type P-100

de Forest Audion Control and Amplifier Panels

Series P-100, P-200, P-300

Type P-100. Audion Control Panel. Illustrated above.

A new type of audion control remarkably flexible in its applications. Designed for our standard four prong audion tube. May be used with any tuner as a detector or oscillator and by a slight change in connections it becomes a one-step amplifier which can be used in connection with a crystal detector or another audion control panel. It is especially designed for commercial and laboratory use where a variety of circuits for different tests are desired.

The panel and case as well as the "B" batteries and amplifying coil are identical with those of our P-200 two-step amplifier and P-300 combination audion ultraudion and one-step amplifier. A system of small self-cleaning switches with laminated switch arms and segmental rather than pig-tail connections provides an easy and immediate method of altering the circuit to any desired condition. Six pairs of binding posts are provided, each marked for the proper connection. In the upper left hand corner are the two "INPUT" binding posts connected to the primary of the amplifying coil, which is our standard Type A-200 described in this catalog. In the upper right hand corner are four binding posts, two of which are marked "RA" and "RE." These should be connected to the tuner when the apparatus is used as a detector or oscillator. When the panel is used as an amplifier these two binding posts are connected to the two other binding posts adjacent to them by means of nickel plated straps. This connects the secondary of the amplifying coil to the grid and filament of the tube.

The switch in the upper left hand side marked "GRID CONDENSER" short circuits the grid condenser and grid leak when the apparatus is used as an amplifier.

On the upper right hand side is a switch marked "B" battery. This allows of using either 20 or 40 volts of the "B" battery with which the outfit is equipped. The remaining switch below this one throws the panel from the audion to an ultraudion connection.

By means of the two center switches on either side of the panel various circuit combinations may be obtained for the reception of both damped and undamped wave signals.

Below the four switches are mounted the stopping and bridging condensers. These are our step-by-step type and are of the proper maximum capacity graded from a small minimum. The proper connections to each binding post are clearly indicated by engraved lettering.

The binding posts are of moulded dialecto with the new slotted feature for holding the connecting wires firmly.

The audion tube receptacle is our standard Type R-100 with a nickel plated finish.

The four control switches are provided with 1" bakelite knobs and the stopping and bridging condensers are equipped with our standard $1\frac{1}{2}$ " bakelite knobs. These condenser switches are of the improved fan type which insure positive contact and practically no leakage.

The self contained "B" batteries are mounted on a frame work which is removable and allows full access to the rear of the panel in case any trouble should arise or the operator should wish to change the circuit. The amplifying coil is mounted on the false bottom and is connected to the panel by macaroni covered wire.

The panel is of highly grained bakelite dielecto and the cabinet has our standard "Early English" finish. All parts on the panel are nickel plated so that the complete instrument is finely finished throughout.

Measurements: $12\frac{1}{2}$ " x $9\frac{3}{8}$ " x $7\frac{3}{4}$ ".

Cat. No. P-100. Code word: Locrine. Shipping Weight 35 lbs. Price Without Tubes, \$67.50.

Two-Step Amplifier—Type P-200. Not Illustrated.

This is our very latest in amplifier design and will be found to be very different and so much more efficient than our older types of amplifiers that there is no comparison. The most notable feature of the new design is its compactness. The small case contains not only the amplifying coils, telephone jacks, amplifier tube receptacles, and filament resistances, but also a "B" battery of 40 volts which is sufficient to give amplifications up to 300 times. All these pieces of apparatus are mounted on the panel and come out with it. The panel is easily removable making all parts most accessible and the replacing of the "B" batteries is but a moment's work.

Unlike the old type "B" batteries, unit batteries of 20 volts each, cast in one block, are used. These come provided with two leads which are connected to the circuit by two connecting clips. It is therefore unnecessary to use a soldering iron to connect together a number of cells as in the past. Moreover, the new type of battery is the most efficient and practical battery made. It has a remarkable shelf life and operating life of approximately 2,000 hours when used with our type VT tubes in this type of amplifier. Users of amplifiers in the past will appreciate this new development in "B" batteries which has taken place during the war.

The amplifying coils are of our A-200 type and are so mounted that there is no field interference between them thus preventing "squeal" when the second step is used. The filament rheostats are of our design (type F-200) providing smooth running and closely variable adjustment, a description of which will be found under our catalog No. UF-200.

The amplifying tube receptacles are of the type UR-100. Small resistances wound on bakelite forms are placed in the negative filament lead of the second tube to keep its grid negative to the proper amount, and thus take advantage of the full amplifying power of the tube without blocking.

Three telephone jacks near the bottom of the panel are provided for connection to the receiving telephones.

The panel is screwed to a false bottom and is held in its case by six screws around its edge. In the rear of the panel two shelves are fastened one above the other to the false bottom and to the four brass angle irons, so that the whole structure is held rigidly in place.

The panel is of $\frac{3}{8}$ " bakelite, beautifully engraved. The tube receptacles are nickel plated. The knobs and binding posts are of bakelite. The binding posts are provided with slots to hold the wire in place while the head is being screwed down. This is a new feature, which though but a detail should be highly appreciated when many connections are made.

The cabinet is of oak with our standard "Early English" finish. It is strongly built and beautifully polished.

In order to operate the instrument it is only necessary to connect a six volt storage battery to the two binding posts marked "A BATTERY." The source of audio frequency should be connected to the two posts marked "INPUT." If the plug on the telephone cord is then inserted in the jack marked "I TEL," the audio frequency to which the device is connected will be received unamplified. If then the plug is inserted in the jack "II TEL" and the filament rheostat marked "FILAMENT TUBE I" is adjusted, the audio frequency will be amplified by means of the first step. If a similar operation is performed with the rheostat for the second tube after the telephone plug is inserted in the jack marked "III TEL," the full amplifying power of the instrument will be obtained.

Cat. No. P-200. Code word: Madox. Shipping Weight 35 lbs. Measurements $12\frac{1}{2}$ " x $9\frac{3}{8}$ " x $7\frac{3}{4}$ ". Price without amplifying tubes and "A" battery, \$69.50.

Combination Audion-Ultraudion and One-Step Amplifier.

Type P-300. Illustrated on Page 29.

The P-300 was designed to fill the crying need for a combination detector and amplifier in the average amateur or commercial radio receiving station. Unlike our type P-100 Audion Control Panel, this panel is equipped with sockets for two tubes so that the detector and amplifier can be used at the same time. Although the type P-100 Control Panel can be used as an amplifier, it must be used either as a detector or amplifier, but cannot be used as a combination instrument without the addition of another audion tube.

The type P-300 combination instrument is built similar to our type P-100 panel throughout. The same materials and parts are mounted on the same size panel which goes in the same size case. The "B" batteries are of the standard type described with our P-200 instrument, assuring long life. The panel is of beautifully grained bakelite handsomely engraved. The knobs and controls are of bakelite and the metal parts are of brass with a fine nickel polish.

The instrument consists of 2 No. R-300 Audion Receptacles, 2 No. F-200 Filament Rheostats, 2 No. 12 three-point Switches, 1 No. CS-1500 Stopping Condenser, 1 No. CS-3000 Bridging Condenser, 1 G-100 Grid Leak, 2 Telephone Jacks, and 4 Bakelite Covered Binding Posts. The design of these parts together with the materials used may be ascertained by referring to them in the catalog under their respective catalog numbers.

Measurements $12\frac{1}{2}$ " x $8\frac{3}{8}$ " x $7\frac{3}{4}$ ".

Cat. No. P-300. Code word: Mansel. Shipping Weight, 35 lbs. Price without tubes, \$73.50.

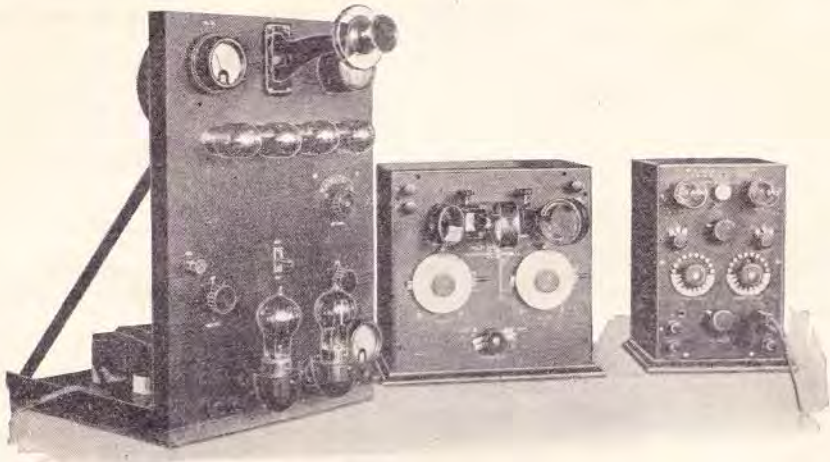


Balanced Primary Circuit Multi-Wave Tuner
Type T-200

THIS is a new tuner of most excellent design and remarkable efficiency. It consists of a type LC-100 triple adjustable coil mounting, a type CV-1503 vernier tuning condenser, a type CV-1003 secondary vernier tuning condenser, and a type US-100 primary condenser switch mounted on a handsomely engraved bakelite panel. It is wired with heavy copper wire in super-fibre sleeving, and the primary circuits are kept well apart from the secondary circuits in order to cut down capacity effects. The complete tuner is mounted in an oak cabinet with the de Forest "Early English" finish. Metal parts are nickel plated with a high polish. Standard bakelite binding posts with the new slotted feature are provided for connection to the aerial, ground and the audion control panel, or crystal detector.

Dimensions of cabinet 13" wide, 18" deep, 12 $\frac{3}{4}$ " high. When used with our P-300 Combination Audion-Ultraudion Detector and One-Step Amplifier Panel, a complete receiver of extreme sensitiveness, selectivity and beauty is provided.

Type T-200. Balanced Primary Circuit Multi-wave Tuner without Coils.
Code word: Riblon. Shipping Weight, 35 lbs. Price, \$77.50.



The de Forest A Radio Telephone and Telegraph Oscillion Transmitter

Type O

ALTHO the de Forest A. C. Oscillion Transmitter is something entirely new on the market, it has been so carefully designed and so well constructed that it is already a practical instrument which may be relied upon to give excellent service over short ranges.

The operation of the instrument could not be simpler. All that is necessary is to connect the power leads of the set to the ordinary house lighting circuit, connect antenna and ground to the terminals of the set, push a button and talk.

NO TROUBLESOME ADJUSTMENTS

The set needs to be adjusted but once. This may be done when it is installed, and once these adjustments have been made it will need no further attention. Absolutely no knowledge of radio telephony is necessary to successfully operate the set, and the non technical man can run it just as well as the most up-to-date radio engineer. It is as simple in operation as the ordinary house telephone.

ELECTRICALLY OPERATED ANTENNA SWITCH

One of the advantages of this radio telephone which will be duly appreciated by those who have had experience with the older types is the remote control system, by which the antenna is automatically connected to either the transmitter or receiver by merely pushing a button. This is a feature, the value of which can be appreciated most after the instrument has been in use.

The telephone is designed primarily for 200 meter transmission, but sets can be furnished to operate on other wave lengths at a slightly increased price.

One 6 volt storage battery is needed in connection with the telephone to operate the microphone and the remote control relay. Any standard storage battery will be satisfactory for this work.

Using this radio telephone in conjunction with receiving equipment furnished by us, ranges of ten to twenty miles and over may be reliably covered with a moderate sized antenna, although distances up to 40 miles have been reported by owners.

The panel on which the apparatus is mounted is of bakelite 14"x20". It sets on an oak base 14" x 15" so that the complete set occupies a minimum of space. At the top of the panel is mounted a microphone transmitter of the usual type on an arm, to the right and left of which is located the plate circuit milliammeter and the filament ammeters respectively. A small key switch in the center of the panel switches the latter instrument from the oscillating circuit to the rectifier circuit, so that the filaments of the tubes in either circuit may be adjusted to the proper current values.

Receptacles for the four oscillating tubes are located directly below the microphone. These receptacles take the de Forest VT Audion bulb which is provided with a four prong base and fits into the receptacle with a bayonet lock. This is a decided advantage since, if a tube burns out it may be instantly replaced without having to make connection to binding posts, etc., by means of flexible leads as in the old fashion. On the right hand side of the panel below the tubes is located the tuning condenser and receiver. This post represents the aerial receiver connection and the other side of the receiver is connected directly to the ground.

Near the bottom of the panel on the right and left are mounted the filament rheostats. One of these controls the filaments of the four oscillating tubes and the other those of the rectifying tubes at the bottom of the panel. A one ampere scale hot wire ammeter is located to the right at the bottom of the panel for reading the high frequency current output in the aerial circuit. This instrument is connected with the ground lead and there is no danger of a shock should anyone come in contact with it. At the bottom of the panel are located binding posts for connecting with 110 V. A. C. circuit, a 6 V. storage battery for the microphone, the key for telegraphing and the ground connection. Connection to the aerial is made by means of a binding post mounted to the right of the panel at the top.

On the back of the panel is mounted the helix (the inductance of which is variable by means of a contact clip), modulation transformer, tuning condensers, filament rheostats, filament switch and condensers. On the baseboard in the rear is mounted a special transformer which contains three windings in addition to the input winding which is connected with the alternating current source. One of these windings supplies the high potential for the plate circuit of the oscillator and the other two the low potential filament currents.

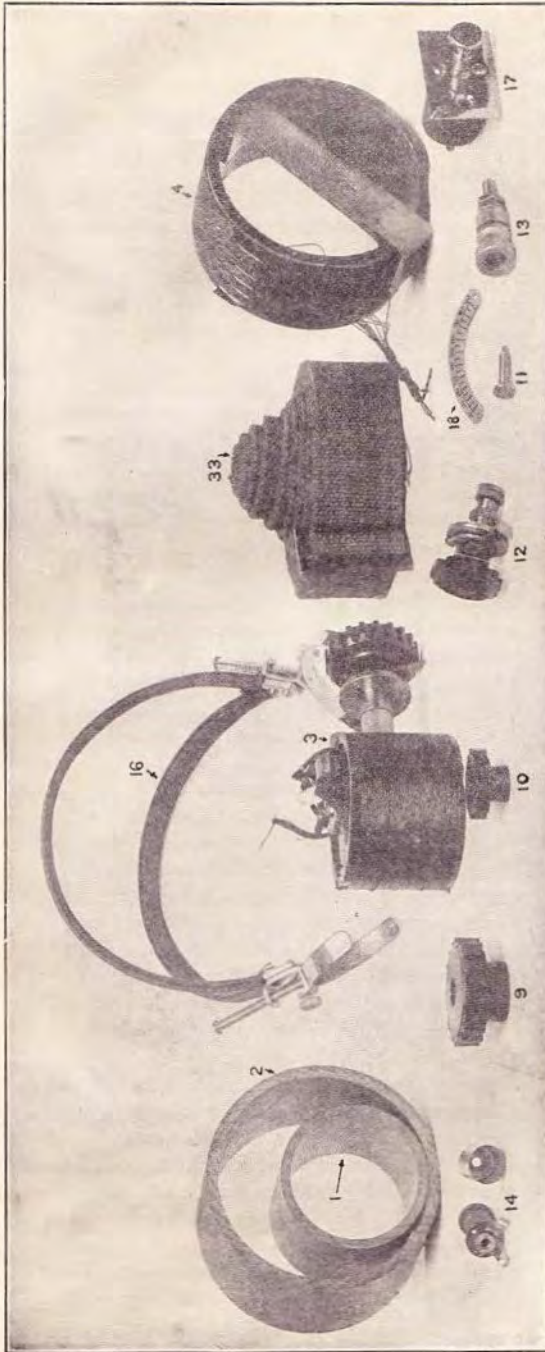
The panel is mounted on the baseboard by means of japanned iron brackets, providing a most stable mounting. The wiring is of heavy wire highly insulated and connections are soldered after the wires are formed into shape so that there is practically no chance of a break or loose connection. The set is made up in every respect with the same class of materials and workmanship as that with which our larger and more expensive transmitting apparatus is manufactured.

The absence of the usual motor generator set with its customary noise and troublesome oiling, etc., is particularly noticeable and should be especially appreciated by those who have previously used such sets. Also the absence of the customary wiring from the motor generator set, control panel and other accessory apparatus is particularly desirable. The new transmitter is clean-cut in every respect since its design has been boiled down to that of a most practicable piece of apparatus, simple and "fool-proof," far more serviceable than the ordinary radio telegraph transmitter. No effort or expense has been spared to make this instrument just what its name implies—a telephone transmitter for genuine service and not a toy. It is the very latest word in radio apparatus. It is already meeting with a wide-spread demand.

For Alternating Current, Price, including tubes, \$260.00

For Direct Current, Price, including tubes and dynamoter, \$325.00

Miscellaneous Materials and Parts



The above high grade materials are offered to amateurs and other experimenters to afford those who wish to build their own instruments, an excellent opportunity of acquiring the necessary parts. See price list numbered to correspond with above, on next page.

MATERIALS AND PARTS

Code Words	Catalog No.	Price
Necolay	1. Dielecto tubing, 2 5-16" O. D. x 2" I. D. x 1 3/4" long, to be used in winding coils. Best insulator made. Ideal composition for coil forms	Each \$.25
Nile	2. Dielecto tubing, 3 5/8" O. D. x 3 1/2" I. D. x 1 7/8" long. Also for winding coils.	Each .35
Octavius	3. Item No. 1 tube wound with 20 strands of No. 38 single silk covered wire and tapped in three places complete with bracket, bushing, knob, pointer and scale ready to mount on panel	Each 2.50
Parnell	4. Item No. 2 tube wound with 20 strands of No. 38 single silk covered wire, tapped in five places, complete with bracket ready to mount on panel	Each 1.50
Paston	9. Unmounted knobs of bakelite, 1 1/2" diam.	Each .15
Pascoe	10. Unmounted knobs of bakelite, 1" diam.	Each .12
Peacham	11. Brass contact points, 3/4" long, 5-16 diam., 8-32" thread	Each .03
Pennant	12. Bakelite knobs assembled with self-cleaning switch arms of phosphor bronze, including bushing and nuts	Each .72
Percival	13. Heavy brass binding posts, unremovable tops, preventing loss	Each .12
Phillmore	14. Resistance units, 45 ohms, for smoothing out buzzer note	Each .40
Picardo	16. Head bands without phones.	Each .75
Pendennis	17. Single gang pull switches. A novel form of switch occupying a minimum of panel space. Excellent for making and breaking battery and other circuits	Each .30
Plumtree	31. Formica panels, 3/8" thick x 7 7/8" square, grade M, highly finished surface for mounting of radio receiving equipment. Best insulating quality known.	Each 1.60
Pococke	32. Cabinets with covers, enabling the closing up of the receiver, and protecting from dust or moisture	Each 4.00
Porson	33. Carrying strap of heavy webbing with steel buckle for portable instruments, 33" long, 1 1/2" wide and 1/8" thick.	Each 1.00
Preble	766. B battery of 20 volts cast en bloc. Provided with 2 leads which are connected by connecting clips. Unnecessary to use a soldering iron. These batteries identically the same as those used in our types P-100, P-200, etc. Operating life approximately 2,000 hours	Each 3.00
Prideaux	J-100. Telephone Plug (without Cord)	Each 1.10
Proctor	J-200. Jack	Each 1.00

United States Government Wireless Telegraph Regulations Governing the Amateur

The Radio Regulations are easily understood and complied with.

The Regulations governing the amateur are as follows:

A receiving station alone requires no license, no matter how large or small it may be, or the location thereof.

A transmitting station requires a license, which may be obtained free of charge from the Radio Inspector in charge of the district and located at the custom house in the following cities:

No.	District	No.	District	No.	District
1	Boston, Mass.	4	Savannah, Ga.	7	Seattle, Wash.
2	New York, N. Y.	5	New Orleans, La.	8	Cleveland, Ohio
3	Baltimore, Md.	6	San Francisco, Cal.	9	Chicago, Ill.

Address: Radio Inspector, care Custom House, in the city named above which is nearest you.

Power used for transmitting must not exceed 1 kilowatt and when a station is within five miles of a Government Wireless Station, the power is limited to $\frac{1}{2}$ kilowatt.

The transmitting wave length of the station must not exceed 200 meters.

A copy of the "Radio Communication Laws" of the United States may be had from the Superintendent of Documents, Government Printing Office, Washington, D. C., at 15 cents a copy. Every amateur will be benefited by reading this bulletin.

About Transportation Charges

When goods are to be shipped by parcel post, it is not necessary to send stamps to pay the postage for shipping package. Simply add the amount for charges to the amount of the merchandise and include in the money order, check or currency you send us. This charge for mailing must be paid in advance, as no provision has been made for the collection of mailing charge on delivery.

When goods are to be shipped by freight or express and there is no freight or express agent at your shipping point, you must send money to prepay the transportation charges. If there is an agent you can pay the transportation charges when shipment reaches you. It is only necessary to prepay freight or express charges when there is no agent at your station.

Throughout our catalog you will find the shipping weight is given in the description of merchandise.

When you return goods by parcel post, put the letter you write and the bills for the goods in an envelope and paste or tie the envelope securely to the outside of the package. In addition to the parcel postage, put 2 cents postage on the envelope.

de Forest

STAMPED ON RADIO APPARATUS IS A SYMBOL OF MERIT

**The Audion Amplifier made possible Transcontinental Telephone Service.
The Audion Ultraudion is used in all long-distance Radio Telegraphy.
The Oscillion Transmitter made possible Trans-Oceanic Telephony.**

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