

# THE HORN SPEAKER

968

Radio News for April-May, 1925.

## Who's Who in Radio

### No. 15

### JOHN V. L. HOGAN

ONE of the best-known radio engineers in the United States is John V. L. Hogan, who has been identified with the art for the past fifteen years or more. Like so many other workers in the field, Mr. Hogan began as an amateur; the first apparatus with which he experimented, in 1922, was of the coherer type and had a working range of only a few hundred feet. It was enough to catch and hold his interest in this new art, however, and within a few years he was breaking distance records for reception by using apparatus of his own design and construction. In 1906 and 1907 he worked with Dr. deForest as chief laboratory assistant in the development of the audion and the radio telephone; at that time the very first grid audion, the forerunner of the present day three-electrode vacuum tube, was produced and the first radio telephone broadcasting station was operated by Dr. deForest and Mr. Hogan, transmitting phonograph and Telharmonium music by wireless on daily programs. Early in 1908 Mr. Hogan secured permission to erect a receiving station on the top of the Times Building at 42nd street, New York, then one of the tallest buildings in the city; here he experimented with several interference-reducing devices of his own invention, and succeeded in copying many complete messages from stations as far distant as San Juan, Porto Rico, Guantanamo, Cuba, and Colon, Panama, through severe interference. In this same year his contributions to the technical press commenced to appear, among them "Methods of Wireless Tuning" in the *Electrical World* and articles on the Audion in *Modern Electrics*.

In 1909 Mr. Hogan filed his earliest applications for patent, while a student at Sheffield Scientific School of Yale University. His article on "Inductance Coils Used in Wireless Telegraphy" appeared, with several others from his pen, in the *Electrical World*. At Yale he took honors in physics and mathematics, and was granted the use of the Graduate Physics Laboratories for radio experimentation; here he carried on several investigations into detector, tuner and heterodyne phenomena, some of which have been described in his later patents and publications.

Having previously established connection with Prof. R. A. Fessenden by reason of his invention, Mr. Hogan joined the staff of the National Electric Signalling Co., as telegraph engineer in December, 1909. He proceeded to the experimental trans-Atlantic station at Brant Rock, Mass., in January, 1910, and there took charge of the plant's operations, including the preliminary tests between Brant Rock and the Scout

Cruisers, Birmingham and Salem, which preceded reinstallation of the 100-k.w. Fessenden transmitter at Arlington, Va. In this same year, 1910, Mr. Hogan's first U. S. patent (No. 950,781 on a crystal detector) was issued, and several of his articles appeared, including "The Wireless Telephone" in the *Electrical World*. Before the end of the year, Mr. Hogan had been promoted to the position of telegraph superintendent and his work extended to include cooperation in the design and development of new apparatus, as well as experimental



Mr. John V. L. Hogan, Consulting Engineer, Who Was One of the Pioneers of Radio.

supervision in connection with radio telephone installations.

Several technical papers, including "A Simple Wireless Telephone" and a study of the "Operation of Detectors in Wireless Telegraph Service", appeared over his signature, and he presented an address on "Applications of Multiphase Current to Wireless Signaling" before the Wireless Institute in New York. He was elected Secretary of the Society of Wireless Telegraph Engineers.

Early in 1912 Mr. Hogan supervised the erection of the Bush Terminal station (now "WNY") whose tall T-shaped structural steel towers are still one of the landmarks of New York. During this year several additional patents were issued to him; several papers, including "Standardization in Wireless Telegraphy" where published; and

he completed the consolidation of the Society of Wireless Telegraph Engineers and The Wireless Institute (in cooperation with Dr. A. N. Goldsmith, Secretary of the latter organization) into the Institute of Radio Engineers. Mr. Hogan was elected a Manager of the Institute of Radio Engineers and appointed by the American Institute of Electrical Engineers on the committee on organization of the International Electrical Congress.

The National Electric Signalling Company completed the installation of the U. S. Navy's first highpower station, at Arlington, Va., during 1913, and Mr. Hogan was given direction of the acceptance test operations between that plant, "NAA", and the U.S.S. "Salem." Using spark transmitters and heterodyne receivers, signals from the ship were copied reliably up to 1300 nautical miles, while the vessel copied all messages from Arlington up to a distance of 2,375 nautical miles, both entirely by daylight. Mr. Hogan's well-known paper on "The Heterodyne Receiving System" was presented in June, 1913, before the Institute of Radio Engineers, of which Society he was again elected a Manager, and his article on "Quantitative Results of Recent Radio-Telegraphic Tests Between Arlington, Va., and U.S.S. Salem" appeared in the *Electrical World* and the *Electrician*, of London.

Mr. Hogan was appointed Chief Research Engineer of the National Electric Signalling Company in 1914; his work was largely confined to the development of automatic high-speed recording apparatus for long-distance radio telegraphy, though radio telephony came in for some attention. Among his articles during the year were "Radio-Telegraphy at the Eiffel Tower," and "The Most Powerful Government Wireless Plant, at Arlington, Va." (*Scientific American*), "Wireless Telegraphy in Railroad Service" (*Railway Electrical Engineer*), "A New Marconi Trans-Atlantic Service" and "Trans-Atlantic Radio Station at Sayville, N. Y." (*Electrical World*). Further patents were issued to Mr. Hogan during the next two years, and he became still more closely identified with important patent litigation in radio. He addressed the New York Railroad Club, the American Institute of Electrical Engineers at Johns-Hopkins University (on "Physical Aspects of Radiotelegraphy") and presented a paper on the "Developments of the Heterodyne Receiver" before the Institute of Radio Engineers. During 1915 his articles on "The Principles of Radio Telephony," "Radio Telephony and Telephony for Railroads" and "The Signaling Range in Radio Telephony" appeared in the *Scientific*

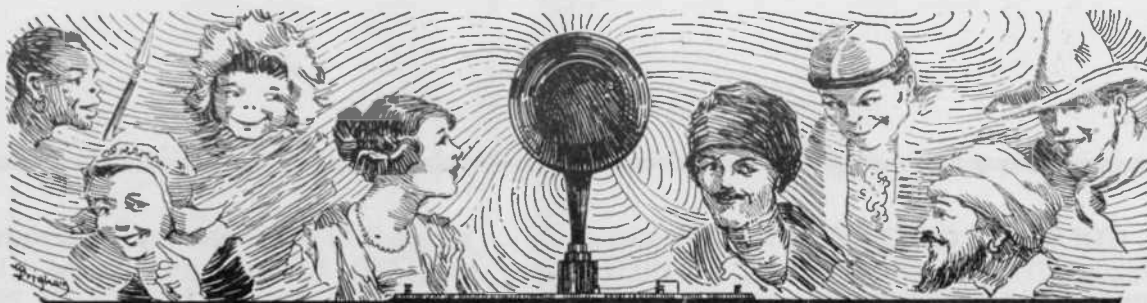
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*American* and the *Electrical World*. Technical papers and reviews by Mr. Hogan were published in various technical magazines, including those on "The Static-Coupled Receiving Tuner" and "Measurement of Signal Intensity". He appeared in Washington before Congressional Committees to oppose bills which had been introduced to establish Government ownership of radio and to restrict commercial and amateur operations.

The National Electric Signalling Company changed its name to the International Signal Company in 1917, and Mr. Hogan was made Commercial Manager, having charge of operations and manufacturing work. During this period the United States entered the World War, and both Mr. Hogan and his company, were exceedingly busy in designing and producing radio outfits for submarine chasers, "Eagle" boats, and aircraft. He nevertheless found time to talk before the American Institute of the City of New York and the Brooklyn Institute of Arts and Sciences, and to write annual reviews of electrical communication, which appeared in the *Electrical World*, as well as a series entitled "Wireless Work in Wartime" for the *Popular Science Monthly*.

In 1918 he was made Manager of the International Radio Telegraph Company, and served as Chairman of the Radio Engineers Committee on National Defense. In 1920 he was made President of the Institute of Radio Engineers, and was admitted to Member grade in the American Institute of Electrical Engineers. He addressed the former organization on "Problems of Radio Regulation", and was active in opposing restrictive regulation, which the Government ownership advocates in Washington were pressing before Congress. Several additional patents issued to him during this year, and, with the return of the coastal radio stations to private ownership and operation, the International Company began the organization (under his direction) of the coastal chain which has given so high a grade of radio service for the past few years. Work on these stations continued into 1921, and, the Westinghouse Electric & Manufacturing Co., having taken a substantial interest in the International Company, the marine radio service afforded was extended. During 1921 Mr. Hogan served as a Manager of the Institute of Radio Engineers, and on its Standards Committee, as well as on the Telegraph and Telephone sub-committee of the A. I. E. E. Standards Committee. His paper on "The Heterodyne Receiver" appeared in the *Electric Journal*, and he addressed the engineering students of Johns-Hopkins University on "Radio-Telephony; Its Principles and Use".

His interest in the present development of radio telephone broadcasting, as well as his earlier work in the improvement of radio technology (especially in the introduction of the detector-heterodyne receiver and static-balance antenna systems) are so well known as not to require comment. In the field of consulting engineering Mr. Hogan should have ample opportunity to continue effectively his efforts for the advance of the radio art.



Radio News for May, 1925

2095

# Push-Pull Amplifiers with Standard Parts

By PHILIP K. WINSLOW

*The efficiency of the push-pull amplifier in point of perfect tone reproduction has long been known. Here is a method of building it which uses only standard parts which every experimenter owns.*

**B**ECAUSE the push-pull audio frequency amplifier has seemed to require two special transformers, many radio fans have been deterred from adopting it by the extra cost involved.

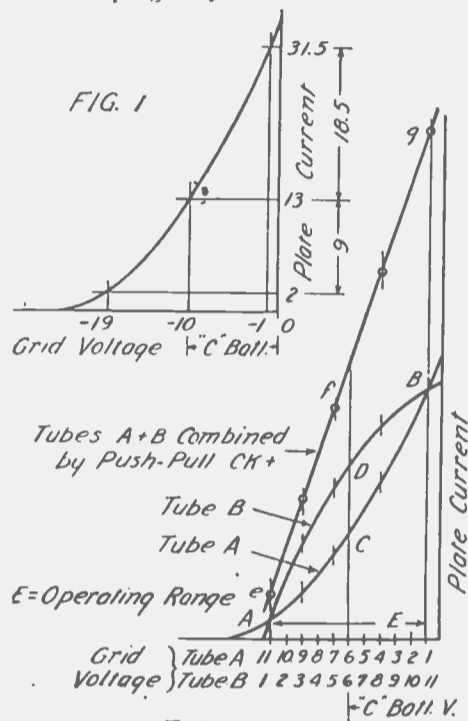


Fig. 1 shows the familiar characteristic curve of the average tube. Fig. 2 shows push-pull combination effect.

Here is a method of construction which requires only one transformer and that of the standard two-winding type. The results will be equally satisfactory.

Before going into details of how to construct this particular circuit, it may well be asked, "Why build a push-pull at all?"

To answer clearly that sensible question, let us go a little into the fundamentals of amplifier design. In the earlier stages of an amplifier, it is not necessary for a tube to give out much energy because the apparatus it feeds (the inter-stage transformer and the grid of the next tube) requires very little energy. However, as the stages increase, more and more power is required.

From the standpoint of power output alone, the two tubes might be connected in parallel, but having them in the so-called "push-pull" circuit clears up a certain kind of distortion and so this circuit is always

used. A study of the familiar vacuum-tube characteristic curve, as shown in Fig. 1, will explain this. Suppose a 10-volt negative "C" battery is used, and that the incoming signal superimposed a maximum of nine volts, alternately + or -, on the steady C voltage of the grid. The actual grid voltage then swings from -1 to -19 volts, and the plate current rises and falls also. But the latter is not proportional to the former because the tube's response falls off at the lower end, i. e., the characteristic is curved. This curvature, while most pronounced at the lower end, really exists throughout the working range. One of its effects is to "heterodyne" two strong audio notes, producing a "beat" note which is sometimes heard as a high-pitched buzz, but more often spoils the clarity of the other tones without attracting attention to itself.

Suppose, however, that we arranged two tubes in a circuit so that while the grid voltage of one was decreasing that of the other was increasing. Then, by putting the plate currents through a transformer so as to reverse the effect of one tube, we could make the two outputs add up. Doing this graphically in Fig. 2, where ACB is the curve of one tube and ADB that of the other (with direction reversed in the output transformer), EFG is the resultant current, and this line is evidently much straighter than either of the original lines. Hence the heterodyning of one audio note with another will be much less than with either tube alone or with the tubes in parallel.

The usual way of arranging tubes in push-pull is shown in Fig. 3. All the elements of this diagram are familiar to radio fans, and need no explanation except the symbols "I" and "O." These stand for "inside" and "outside," respectively, and identify coil ends that have the same polarity at any instant. To connect coils in series, we connect an I to an O, just as we connect a + terminal of one battery to a - terminal of another battery. When a direct current flows into such a junction point, as where the "B" battery connects to the output transformer, half of it flows through the upper coil, creating a magnetizing force acting upward, and the other half flows through the lower coil, creating a magnetizing force acting downward. When a signal comes in from

the previous stage, it generates an alternating voltage in the secondary of the input transformer acting at a given instant in the direction of the nearby arrows. Now measuring the grid-filament voltages, this new voltage will tend to reduce the effect of the "C" battery on the upper tube and increase it on the lower tube. So the plate current through the upper tube and its coil is increased, giving an increased upward magnetizing force in the core of the output coil. At the same time the plate current in the lower tube and coil is reduced, giving a reduced downward magnetizing force. The latter has the same effect as the former—to increase the magnetism in an upward direction. A moment later, with the reversal of

If you look at the windings of a head receiver or of any loud speaker of the iron diaphragm type which has two coils, you will see that the coils are connected by a little soldered pigtail. This is the mid-point of the whole winding, and it can be used in just the same way as the mid-tap of an output transformer. Connect it to the positive end of the "B" battery, the plate of one tube to the end of one coil and the plate of the other tube to the end of the other coil. Current will flow from the battery through one coil to the plate of one tube, and in so doing, will aid, let us say, the permanent magnet in creating a magnetic pull on the diaphragm. Current will also flow from the battery through the other coil to the plate of the other tube, but this time it will oppose the permanent magnetism. Suppose that the audio wave makes the first grid more positive; more current will flow through the first coil, and increase its assistance to the permanent magnet of the speaker. Result: more pull on the diaphragm; it moves toward the magnets. At the same instant, the second tube's grid becomes more negative; less current flows through its coil, and its opposition lessens. Result: again more pull on the diaphragm. So the loud speaker coils cause the outputs of the two tubes to add up their energy and give louder signals.

### LOUD SPEAKER CONNECTIONS

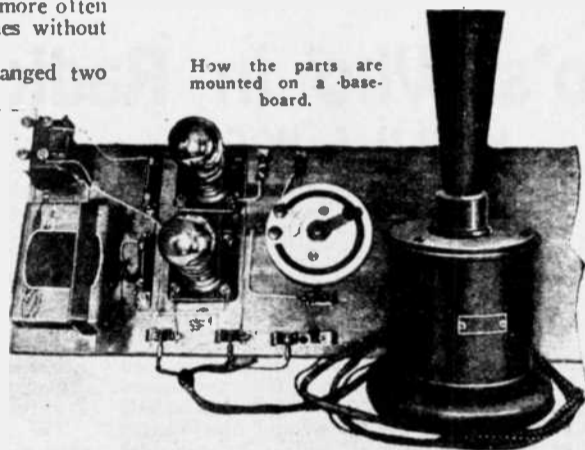
It has just been said that the steady flow of "B" battery current in one coil opposes the magnetic effect of the current in the other. The two effects are equal and opposite, and hence cannot demagnetize the permanent magnet. This is a danger in the usual amplifier connection (speaker in series with battery and plate) which calls for care in connecting the proper speaker terminal to the battery lead. There is no "proper" terminal in this new hook-up; either terminal goes to either plate, and the battery goes to the connection between the two coils.

This hook-up may be used with any loud speaker which has two coils in the voice circuit. In some cases, where the inter-coil lead is covered with braid, a little delicacy is needed to remove the braid without cutting the wire. The writer has found that an old safety razor blade, broken obliquely to give a sharp corner, is ideal for the job. After carefully slitting the insulation, it is pulled back and the wire inside served with a drop of solder from a soldering iron. Then a piece of stranded wire is soldered on, and led to a terminal, whence a lead is taken to the + 90-volt terminal of the set.

To compare this method with one of the standard two-transformer circuits, the writer built it up, as shown in the photograph. The parts were those which happened to be on hand and are evident when recourse is made to the diagram.

For test purposes, a Neutrodyne receiver was used whose last stage was a push-pull amplifier using a pair of well-known transformers. A two-circuit jack just ahead of this stage allowed the output of the first stage to be diverted to the special amplifier. The same tubes, filament current, and "B" battery were used in each amplifier. The same loud speaker was used. When on the regular amplifier, the extra lead was left dead. No difference in tone quality or volume could be noticed between the two circuits, yet the second represented a saving of at least \$5, and several square inches of valuable back-of-panel space.

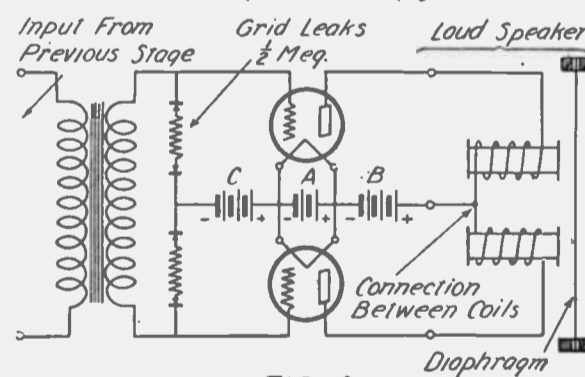
In conclusion, it might be well to add that a push-pull amplifier will not "show its stuff" unless the tubes are worked hard. This means 130 volts of "B" battery and nine volts of "C" battery. If you can get enough volume without distortion with 90 volts, or less, of "B" and a 4½-volt "C" battery, probably the conventional single tube will answer for the last stage. But even so, people are coming more and more to realize that a liberal margin of load capacity is just as desirable in a radio set as in an automobile, and they are more and more willing to ensure good quality by providing for it.



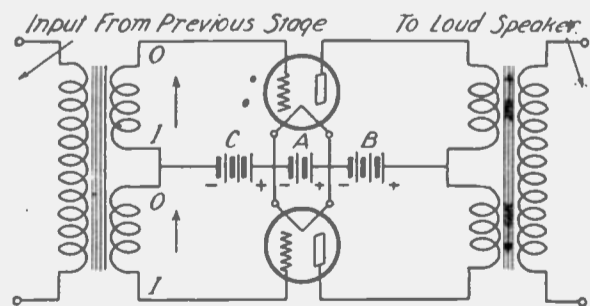
the incoming wave, the whole action is reversed, and both tubes act to increase the magnetism downward. This alternation of magnetism induces a voltage in the output secondary which sends current through the loud speaker.

For some reason, probably the slight increase of cost, manufacturers seldom put out transformers with coils in sections. Some pains are needed to make the two sections equal, and probably the demand does not justify it. There are on the market only two or three makes of transformers with which to construct this circuit, and an output transformer must be used to combine the outputs of the two tubes. To avoid this, it is only necessary to secure two essentials: (1) A mid-point for the grid return-wire at the input side, and (2) a mid-point for the "B" battery at the output side.

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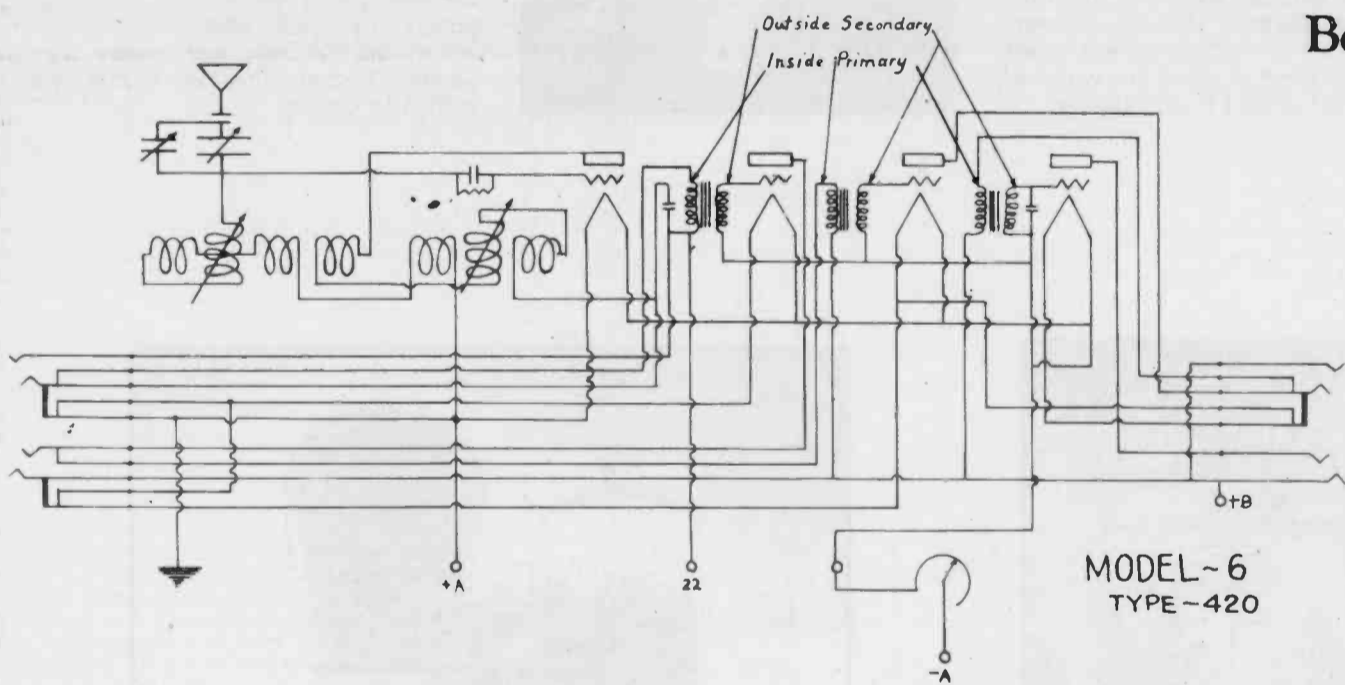


Left: The ordinary 2 tube push-pull amplifier. Right: New method giving excellent results.



Practically no current flows through the grid circuits of the tubes, so the potentiometer method of getting the mid-point between the two grids is available. This potentiometer is made up of two half-megohm grid leaks connected in series, their outer ends connected to the two grids, and their junction to the - terminal of the "C" battery and through the latter to the filaments. The secondary of any good audio transformer is connected to the two grids, and the trick is done.





### Beautiful Radio Furniture — Kennedy Receiver,

The Kennedy VI with the Music Master horn speaker, pictured above, was one of the best finds ever discovered in an antique store for only \$65.00. Latest word about this set, Bill Miller took this beautifully finished set of mahogany and trim, set off with four glowing rainbow-colored tubes to Colorado. The real wood on the Music Master speaker sitting next to Kennedy set makes them one of the finest ensembles to come out of 1923.

Also, you might like to read the 1924 Kennedy description of their model X, which has an enclosed speaker.

### Model X

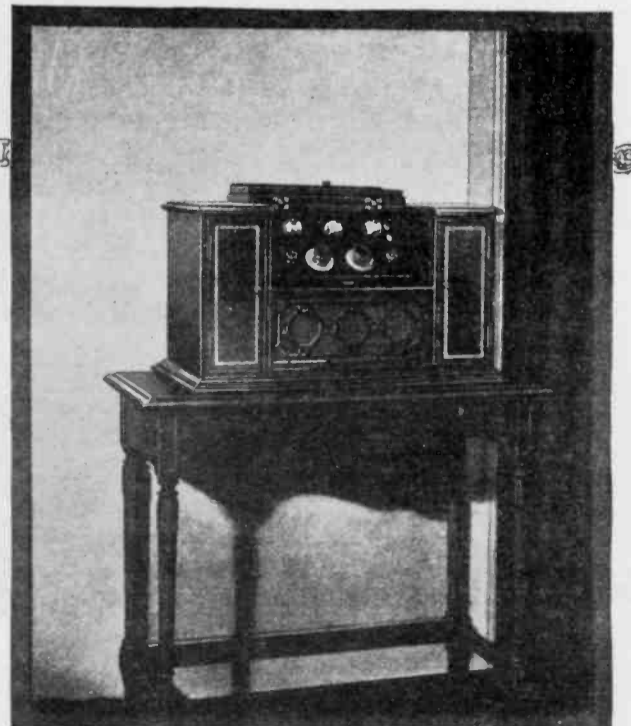
As a graceful piece of furniture, the Kennedy Radio Receiver, Model X, makes a charming addition to any home. The cabinet is of mahogany, hand rubbed to a beautiful finish—with its delicate inlay of satinwood and ebony and the grill at the front, it is truly typical of the Sheraton design. A loud speaker of superior quality is built into the cabinet—by this means faithful reproduction of music and voice is available to an entire family or assembly of guests.

The control panel is symmetrically balanced and immediately indicates the remarkable ease with which the receiver may be operated—the angle at which it is set is the result of much study to provide greater comfort while tuning.

The receiving unit in Model X is every-

where recognized as one of the most noteworthy achievements in radio development—particularly since it sets a new standard of operating simplicity in combination with the precision and selectivity that have always been a feature of Kennedy radio receivers.

The price of Model X, completely equipped with all tubes, dry batteries, built-in loud speaker and individual Kennedy 3,000-ohm phones, with plug, is \$285.00. Other models range from \$125.00 to \$825.00, completely equipped.





## Workshop & Laboratory



# Rejuvenating Dry Cells

By Dr. E. Bade

WHEN the zinc of a dry cell is eaten out, the cell is usually thrown away and a new one procured. This is not necessary; a well made dry cell of standard make can be made to give

twice as much service as it has already given before new ones are required.

When a dry cell goes dead, and the zinc is still good, additional life may be given by punching a few holes in the zinc and placing the battery in a concentrated solution of ammonium chloride. But when the zinc is eaten up, no life can be added by this method. It becomes necessary to make a straight Leclanché cell.

This is accomplished by removing all traces of zinc from the outer wrapper of the dry cell. When the zinc is removed, a cardboard layer will usually be found beneath it; carefully remove it, until the black inner layer of carbon and manganese dioxide is exposed. If it is a cheap make, the paper will be lacking and a cloth wrapper will be found in its place. Do not remove this. The better grades of dry cells will fill the carbon center rod to within 1/4 of an inch of the top. Cover the entire carbon and manganese mixture with a piece of cloth and wrap a strong string around it very tightly.



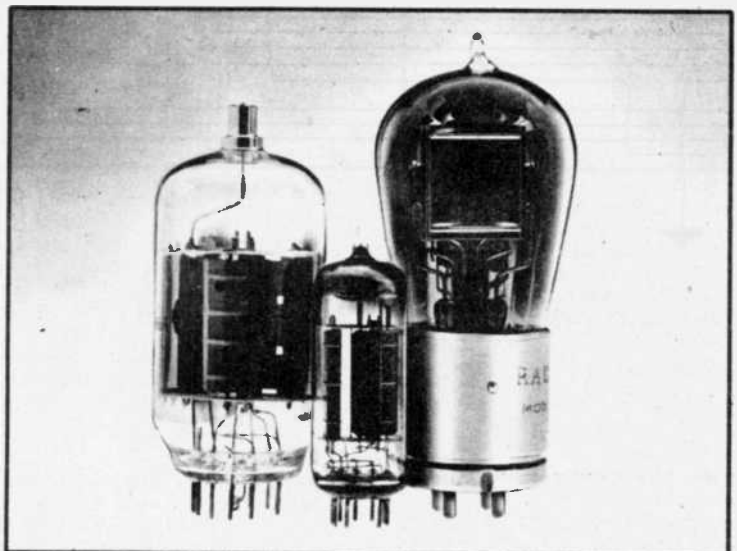
Then take a piece of zinc, which can be obtained in sheets of almost any thickness, and bore a hole near the top after it has been cut into strips just long enough to encircle the carbon cylinder. Into this hole a bolt is passed and a wire is bent around it, then a nut is attached and the bolt and nut tightened. This is the negative pole of the battery.



Pour into an open quart jar a concentrated solution of ammonium chloride, and into this solution place the carbon element. Then the negative element, the zinc ring, is introduced, and the cell is finished. This cell will give, on the average, 1.1 volts. When one volt is to be drawn for a protracted period as in radio tubes, then a number of these cells should be placed in parallel by connecting zinc to zinc and carbon to carbon.



The 1921 Magnavox Telemegaphone TS-2 with a 18 inch bell that fits the class of its surroundings in the picture.



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# Blazing the Amateur Radio Trail

Memories of By-Gone Days When Spark Coils, Slide Tuners and Electrolytic Detectors Were in Style

By OLD TIMER

Radio News for January, 1922

TAKE away the present radio laws, licenses, vacuum tubes, simple tuning apparatus, radio telephone and a few other characteristics of present-day radio and you are back to the pioneer days of radio.

My first contact with radio was during the first electrical exposition in New York City. The center of attraction was the exhibit of the Marconi company, consisting of two simple stations for sending and receiving messages back and forth across the wide floor of the old Madison Square Garden. Each station, which was mounted on an ordinary table, comprised a ten-inch spark-coil, a key, the necessary primary current supply, a magnetic detector, and a pair of telephone receivers, not to mention the huge aerial and the ground connection. Each station was in charge of a fastidiously dressed young man, with a very, very sagacious look. A buzzer would have been sufficient to span the short distance between the two stations, but then why use such an unimpressive device as a buzzer? The crashing purple sparks, jumping the large spark-gap, never failed to attract a large crowd of inquisitive persons. For that matter, the operator at either end could read the signals by the noise of the other operator's spark gap—but I must not give away such secrets. It spoils the whole effect, does it not?

At any rate, that was my first encounter with radio, and whether it was the sagacious and contented looking young men or the purple sparks that did it, I do not know; but from that time on I became a confirmed radio enthusiast.

Somewhere I read about Marconi's early experiments with a coherer, and I immediately proceeded to construct one with a piece of glass tube, two solid silver wires, a couple of binding posts and an old box as a base. Not realizing the importance of a relay, I placed the coherer in circuit with a simple bell, arranged as a decoherer. The aerial consisted of one of the household pie tins, hanging at the end of a ten-foot wire that dangled from the fire-escape in a city apartment.

All the while I had failed to hear the loud hammering going on in an adjacent room, until finally it dawned on me that this radio outfit was a pretty sensitive affair after all, and that even a light tap on the box made it set off the bell. Then and there I discovered that each time my neighbor used his hammer, the coherer went off. Hence my first radio messages were nothing more than hammer blows.

A short time later I went to the old carbon grain coherer, with which I soon succeeded in obtaining audible signals by means of a single 75-ohm telephone receiver. If nothing else, the carbon grain coherer was the means of obtaining loud signals from nearby stations, but it did not bring in the stations outside of a 25-mile range.

Things progressed rapidly in radio, even in those early days. By 1908 we were all using electrolytic detectors. Most of us made our own. We purchased a short length of Wollaston wire—platinum wire with a silver coating—which we placed in a short length of glass tubing. The glass tubing was then placed in a Bunsen burner flame and heated to a bright red, so that the plastic glass could be slowly drawn out at the point where the wire lay. Then the glass tube became two pointed pieces of glass tubing, and the wire was firmly embedded at the fine tip of each piece. The next step was to cut the wire and take each piece of glass tube and grind the point on an oil stone, until the wire was absolutely flush with the ground glass surface, thus exposing only the actual cross-sectional area of the wire.

The electrolytic detector then consisted of a simple cup holding the electrolyte, generally consisting of one part of nitric acid to four or five parts of water, and the glass-encased wire dipping into the former. A very delicate potentiometer control had to be used for the local battery current pass-

ing through the telephone receivers and the electrolytic detector. The action consisted simply of the decomposition of the electrolyte under the battery current flow, resulting in the formation of a thin layer of gas which finally insulated the delicate point and prevented the further flow of current. However, with the reception of signals the induced current caused the thin layer of gas to be perforated, and restored the flow of current momentarily, only to have the gas again form and the current shut off. Obviously, the telephone receiver gave an audible indication of this action, thus resulting in audible signals.

There was another type of electrolytic detector in which a bare platinum or Wollaston wire was employed, barely dipping in a solution held in a carbon or platinum cup. At any rate, the electrolytic detector, back some dozen years ago, was considered the very last word in ultra-sensitive radio detectors.

For transmitting, we amateurs of those days employed anything in the way of a spark coil, ranging from an old jump spark-coil that had seen service in an automobile, to a ten-inch spark coil of the home-made construction, soaked in an oil bath. For my part I made use of a 3-inch coil and a large number of dry cells. Soon, to my dismay, the dry battery died down to nothing, for that 3-inch coil seemed to have an insatiable appetite for current. So I resorted to an electrolytic interrupter and the house lighting current. The electrolytic interrupter consisted of a piece of heavy glass tubing in which was sealed a piece of heavy platinum wire. This interrupter was placed in series with the induction coil primary and the source of current. The spark coil produced a hot, flaming spark when operated in this manner; and with the proper arrangement of inductance and capacity, some 25 miles could be covered with little trouble, even in those days when receiving sets were anything but sensitive. The only trouble was that the interrupter had a way of breaking down right in the middle of a message, due to an excess of heat which caused the glass tube to crack or even melt. And then the fuses! Time after time the house lights would go out as the consequence of the interrupter's pranks.

The comradeship of radio in those days was quite marked. There were no radio laws, and we did more or less as we pleased. True, there were leaders among us who constantly warned us of the certainty of severe legislation if we continued to act as we pleased. An amateur might decide to work on 600 meters or 203 meters, as his fancy dictated. Or again, in most cases he did not know what he was operated on and cared still less.

One evening I received a call from an amateur but a mile away. He asked me what power I was using, and seemed surprised at the loudness with which I came in. He invited me to call and see his outfit. To be sure, this amateur's transmitter came in like a ton of bricks anywhere in the city, for I had had occasion to hear him on other amateur receiving sets. So I set out for his home.

To my mind, here is one of the most remarkable stories of early radio days. This amateur was a doctor who, so the story goes, had a pet grudge against a large wireless company then operating. Perhaps he had purchased much more or less worthless stock from that concern now long since defunct; perhaps it was a more personal reason; but the point is that he had one of those grudges that stop at nothing to attain their end. His whole aim in life, just then, was to embarrass that wireless company in every possible way, which was not a difficult matter considering the absolute absence of radio laws, crude tuning circuits, and the proximity of one of that company's crack stations.

At any rate, the doctor had got together two huge X-ray transformers, a whole box full of home-made condensers soaked in oil, a huge spark gap which had to be muffled to cut down the noise, and a large ten-wire aerial. The doctor was located on the ground floor of an apartment house, and his lead-in came all the way down from the roof six stories above the transmitter. Every time the key was pressed, the lead-in wire glowed with a purplish brush discharge at night; but what was the differ-

ence? Efficiency meant little or nothing, for the distance to be covered was less than 10 miles.

That station was the greatest nuisance that ever existed. When it was sending, it was impossible, or nearly so, to receive anything from any other station, because said station was operating on a very broad wave which came in all over the tuning coils then in general use for reception purposes.

Within a radius of 20 miles, that amateur station was simply formidable. It had a harsh, unpleasant spark that could be picked up on almost any adjustment of the tuner. It sounded for all the world like a Transatlantic station—at least when within a reasonable range. But the joke of the matter was that this station did not carry very far. I well remember trying to pick it up some 30 miles distant. I finally succeeded in getting it, but the signals were so weak that they could barely be identified. It was simply one of those instances of a big splash, so to speak, which did not get very far. For that matter, it was the same with some of the commercial stations of those early days. Take the old "DF" station—Manhattan Beach—a dinky collection of radio odds and ends thrown together and attached to an aerial located in the swamps back of Coney Island, near the sea. Nearby, that station had a rather low tone, none too loud. But that old station carried! Night after night it carried way down to the Gulf, where fruit steamers were cruising. In fact, it made many of the early radio records. On the other hand, there was a model station known as "WA," located on the roof of the Waldorf-Astoria Hotel in the very heart of New York City. Nothing in the way of expense had been spared in making that station the very last word in radio; indeed, it was a demonstration station where visitors were introduced to the marvels of wireless and the commercial possibilities of radio. Nearby, that "WA" station came in with a roar. Even with our crude receiving sets then available, we could lay the telephones on a table and hear the signals five feet away. But if we got 100 miles away, then "DF" came in about as loud as when heard some few miles away, while "WA" had lost its roar and was, if anything, far weaker than "DF." At several hundred miles distant, "WA" was lost altogether, while "DF" continued to be heard. So this business of loudness in those early days was quite deceptive, as we soon found out.

Pardon me for the digression. I must get back to the doctor with the grudge. The doctor had a practice which he had to attend to, and his calls took him out of his office not a little. But so that no time might be lost, he invited the amateurs from far and wide to visit his station and keep the transmitter busy during his absence. How about having nothing to send? How about having nobody to talk to? Little matter; the doctor suggested that we simply take a newspaper, magazine or any other "copy" and send sentence after sentence, hour after hour! I never saw the electric light bills, but rumor has it that the monthly bills ran up to \$60, and over. I believe it. The doctor was pulling something like 10 kilowatts out of his meter hour after hour. Needless to say, he embarrassed the wireless company greatly; in fact, he made its life almost unbearable about New York. I don't know what was the final outcome of this story. Perhaps the doctor received a just settlement for his efforts, perhaps not. If this were fiction, I could certainly supply a "happy ending" by saying that he finally got his stock certificates cashed for their face value, with compound interest to boot!

The doctor was not the only one who tormented the commercial and Government stations. The chatter passing through the ether was simply dreadful. Everybody was talking at once, and it seemed that perhaps no one was listening in. Every once in a while some commercial operator, with a thunderous spark, which should have commanded a certain degree of respect, would break in, saying: "Go to bed! Haven't you had enough for one evening?" and other phrases with like import.

Little wonder that radio laws were finally passed. Mr. H. Gernsback, then editor of *MONARCH ELECTRICS*, never missed an opportunity of calling attention to the abuse of our liberties, but even though the more conservative among us appreciated our radio freedom and did not want to jeopardize it in any way, there were certain amateurs who simply did not care.

All in all, we were not always a nuisance so far as the commercial and Government operators were concerned. For instance, the old Brooklyn Navy Yard station was located down in a hollow among the several steel bridges that span the East River. Wirelessly speaking, it was more or less screened. Many a time the Navy operator would not be able to copy a message being sent to him, and some thoughtful wireless amateur would break in to tell the Navy operator that he, the amateur, had the message. Then the Navy operator would call up the transmitting station, and tell him to stand by while he got the message from the nearby amateur. The same applied to the commercial operators, who on more than one occasion had to resort to some amateur operator located in a dingy apartment-house bedroom.

By 1909 we got around to the crystal detectors. Some of us used carborundum, but it was so difficult to get good pieces of this material that we generally used something else. Carborundum had at least one good feature, and that was the tightness with which it could be clamped in a detector stand, making it practically proof against mechanical disturbances. Silicon was a great favorite, and later came galena. For my part, I had read in a copy of *The Electrician* of London—that awfully deep but authentic British journal that has ever been the official organ for the foremost wireless workers—that the Germans were using galena with a fine graphite point. So I made detectors from tiny springs on which I soldered the galena, and hard leads for automatic pencils, pointed to a needle point. These detectors were remarkably sensitive. I was able to hear "DU," the station on the DuPont Hotel in Wilmington, in New York City on a two-wire aerial less than 15' long.

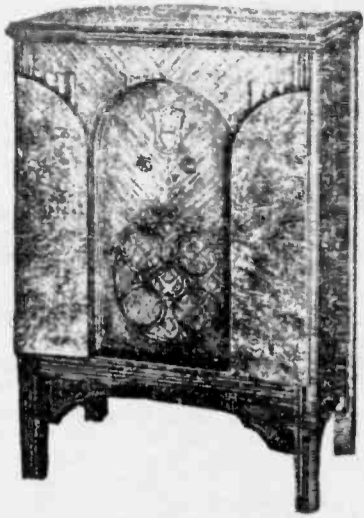
The radio telephone in those days was a laboratory experiment, little more or less than just that. One day, while listening in I happened to detect a hissing, steam-like noise on one part of my two-side tuning coil. Upon finer adjustment the noise grew quite loud, drowning out everything else. Then I caught a few words, followed by music. But how crude! A few words, then a horrible break, a few more words, and another break, and so on. It was an experimenter some few miles away, using an arc to generate the high-frequency oscillations.

Another novel experience was when DeForest first introduced the quenched spark. It sounded like music, for his gap made all kinds of notes, whistling all the while. His station was then located in the Metropolitan Tower, and his apparatus, so I understand, was of the Lorenz design, made in Germany.

By 1910 we began to get into vacuum tubes. These were crude at first, but their sensitiveness over the crystal detectors was so marked that they soon became the most widely used detectors. With these developments came the present radio laws. From that time on progress became more rapid. Better tuning methods were introduced, the vacuum tube became more highly developed, the regenerative circuits were introduced, and with the advent of the war, far greater improvements took place.

The present status of amateur radio is almost unbelievable to one who, but a short 12 years ago, was experimenting in this same field. Indeed, if the development during the next dozen years is just as great, what remarkable things we can look forward to! I have in mind the evening entertainment in the average American home. There will be music, the news of the day, stock reports, baseball scores, and so on. In fact, that already exists to a limited extent. I also look forward to the reception of pictures of the day. Having followed Mr. Edouard Belin's work with great interest, especially his recent experiments in radio transmission of drawings between France and the United States, I have every reason to believe that in the future the amateur, not content with receiving audible signals, will turn to the reception of drawings, type matter, and even photographs. Why not? The ingenious Frenchman has devised a simple receiving apparatus which in time may be reduced to the amateur's needs, and then, when connected with the regular amplifier circuit, it will reproduce anything which may be broadcasted from a Belin transmitter.

Then, too, the radio telephone must develop rapidly. I predict simpler and cheaper transmitters. They must come, for there is a vast demand for simple transmitter within the reach of all. Vacuum tubes must become a common commodity, just as electric lamps are today.



Bush & Lane Piano Co.  
Model 75



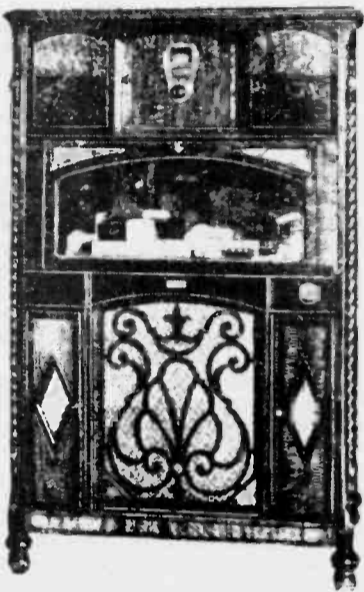
Federal Wood Products Corp.  
Radio Desk



Superior Cabinet Corp.  
Model 530



Decca Disc Phonograph Co.  
"Creatone" Model 99K



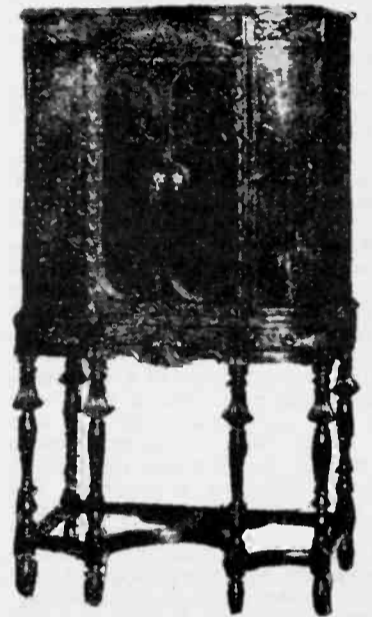
The Capehart Corp.  
Model 110



F. A. D. Andrea, Inc.  
Model 41

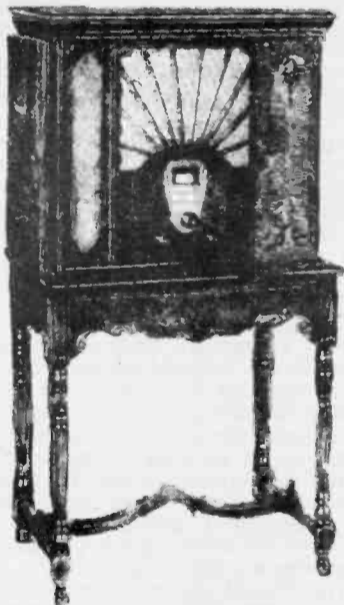


F. A. D. Andrea, Inc.  
Model 42

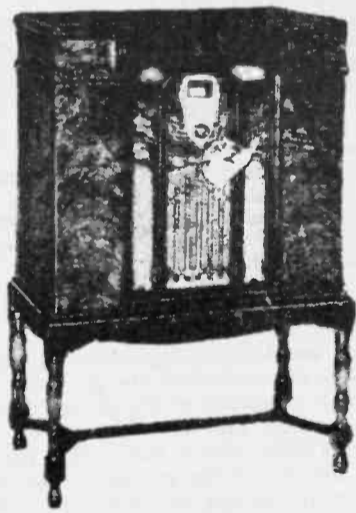


F. A. D. Andrea, Inc.  
Model 46

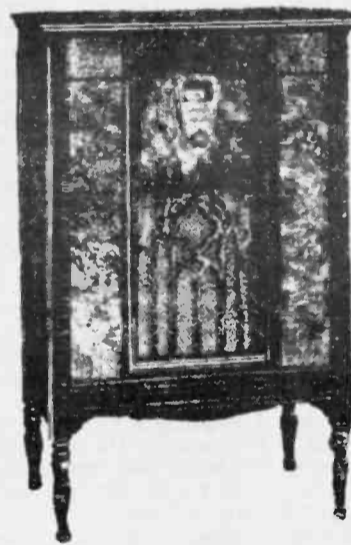
A beautiful group of 1929 console radios.



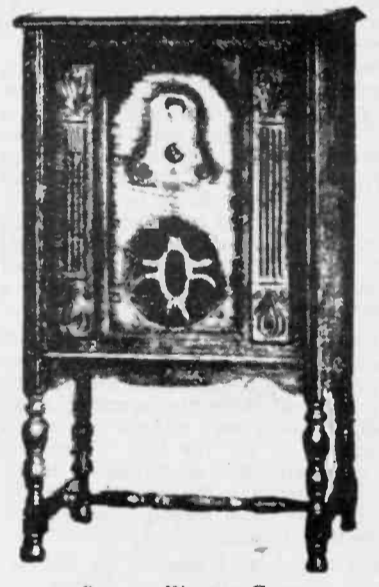
Howard Radio Co.  
"The Puritan"



Howard Radio Co.  
"Consolette"



Howard Radio Co.  
"Plymouth"



Stewart-Warner Corp.  
Model 31

Some price guides show these radios from \$150.00 to \$200.00.



Excello Products Corp.  
Model R71—Phono-Radio Console



All American Mohawk Corp.  
Model 11



All American Mohawk Corp.  
Model 29

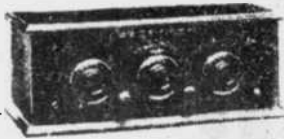


All American Mohawk Corp.  
Model 39

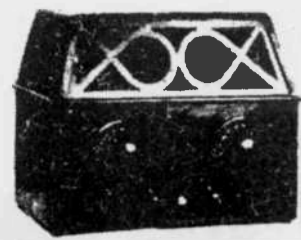




**TRADE NAME:** "Lafayette Neutrodyne."  
**MODEL:** K60.  
**TYPE:** Two radio, detector and two audio.  
**TUBES:** Five.  
**BATTERIES:** Not furnished.  
**CONTROLS:** Three.  
**AERIAL:** Inside or outside.  
**PRICE:** \$160.00 without accessories.  
**MANUFACTURER'S NAME:** The Kor-Rad Company, Inc.



**TRADE NAME:** "Magnutrol."  
**TYPE:** Two stages of tuned radio frequency amplification, detector and two stages of audio frequency amplification.  
**TUBES:** Five.  
**BATTERIES:** None furnished.  
**CONTROLS:** Three.  
**AERIAL:** Indoor or outdoor.  
**PRICE:** \$65.00 without accessories.  
**MANUFACTURER'S NAME:** Magnus Electric Company, Inc.



**TRADE NAME:** Master Craft Grand.  
**MODEL:** 14-4.  
**TYPE:** One-stage tuned radio frequency.  
**TUBES:** Four.  
**BATTERIES:** "A," 6-volt storage; "B," 90 volts.  
**CONTROLS:** Two.  
**AERIAL:** Outside or inside.  
**PRICE:** \$85.00 without accessories.  
**MANUFACTURER'S NAME:** LaMar Manufacturing Co., Inc.

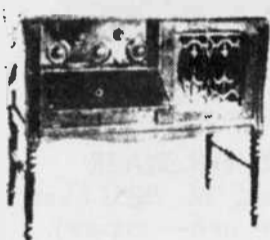
**TRADE NAME:** "The Lasher Capacidyne."  
**TYPE:** Two stages radio frequency amplification, detector and two stages of audio frequency amplification; built-in loud speaker.  
**TUBES:** Five.  
**BATTERIES:** Not furnished, "B" battery compartment in cabinet.  
**CONTROLS:** Three.  
**AERIAL:** Indoor or outdoor.  
**PRICE:** \$175.00 without accessories.  
**MANUFACTURER'S NAME:** LaMar Manufacturing Co., Inc.



**TRADE NAME:** Malone-Lemmon Neutrophone Panel.  
**MODEL:** ML-400.  
**TYPE:** Neutrodyne circuit.  
**TUBES:** Four.  
**BATTERIES:** Not furnished.  
**CONTROLS:** Two.  
**AERIAL:** Outdoor and indoor.  
**PRICE:** \$104.00 without accessories.  
**MANUFACTURER'S NAME:** Carloyd Electric & Radio Co.



**TRADE NAME:** "Master Craft Junior."  
**MODEL:** 12-4.  
**TYPE:** One-stage tuned radio frequency, detector and two audio.  
**TUBES:** Four.  
**BATTERIES:** "A" storage; "B" 90 volts.  
**CONTROLS:** Two.  
**AERIAL:** Outdoor or indoor.  
**PRICE:** \$60.00 without accessories.  
**MANUFACTURER'S NAME:** LaMar Manufacturing Co., Inc.

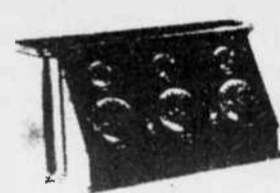


**TRADE NAME:** Malone-Lemmon Neutrodyne Receiver.  
**TYPE:** Hazeltine neutrodyne circuit.  
**TUBES:** Five.  
**BATTERIES:** No batteries furnished.  
**CONTROLS:** Three.  
**AERIAL:** Outdoor or indoor.  
**PRICE:** \$175.00 without accessories.  
**MANUFACTURER'S NAME:** Carloyd Electric & Radio Co.

**TRADE NAME:** "Liberty Sealed Five."  
**TYPE:** Transformer coupled tuned radio frequency, detector and two audio.  
**TUBES:** Five.  
**BATTERIES:** "A" and "B" needed.  
**CONTROLS:** Three.  
**AERIAL:** Indoor or outdoor.  
**PRICE:** \$100.00 without accessories.  
**MANUFACTURER'S NAME:** Liberty Transformer Company.



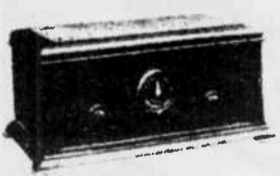
**TRADE NAME:** "Master Reflex."  
**MODEL:** 1-V.  
**TYPE:** Reflex with crystal detector.  
**TUBES:** Four.  
**BATTERIES:** Not furnished.  
**CONTROLS:** Three.  
**AERIAL:** Indoor or outdoor.  
**PRICE:** \$100.00 without accessories.  
**MANUFACTURER'S NAME:** Biltmore Radio Company.



**TRADE NAME:** Master Craft Aristocrat.  
**MODEL:** 15-4.  
**TYPE:** One-stage tuned radio frequency, detector and two-stage audio frequency amplification.  
**TUBES:** Four.  
**BATTERIES:** "A," 6-volt storage; "B," 90 volts.  
**CONTROLS:** Two.  
**AERIAL:** Indoor, outdoor.  
**PRICE:** \$65.00 without accessories.  
**MANUFACTURER'S NAME:** LaMar Manufacturing Co., Inc.

**TRADE NAME:** Magnavox Receiving Set.  
**MODEL:** TRF-5.  
**TYPE:** Tuned radio Frequency.  
**TUBES:** Five.  
**BATTERIES:** Not furnished.  
**CONTROLS:** Two.  
**AERIAL:** Outdoor and indoor.  
**PRICE:** \$125.00 without accessories.  
**MANUFACTURER'S NAME:** Magnavox Co.

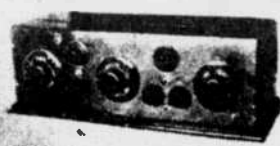
**TRADE NAME:** "Master Reflex."  
**MODEL:** V.  
**TYPE:** Reflex with fixed crystal detector; four stages radio frequency amplification and three stages of audio frequency amplification.  
**TUBES:** Five.  
**BATTERIES:** "A," "B" and "C" required.  
**CONTROLS:** Three.  
**AERIAL:** Indoor or outdoor.  
**PRICE:** \$125.00 without accessories.  
**MANUFACTURER'S NAME:** Biltmore Radio Company.



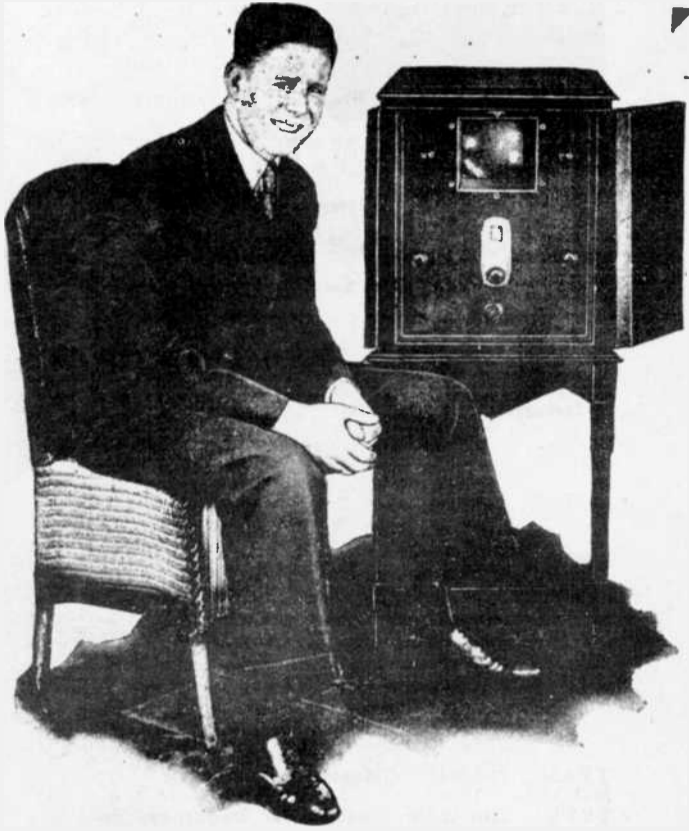
**TRADE NAME:** Master Craft DeLuxe.  
**MODEL:** 18-4.  
**TYPE:** One-stage radio frequency.  
**TUBES:** Four.  
**BATTERIES:** "A" 6-volt storage; "B," 90 volts.  
**CONTROLS:** Two.  
**AERIAL:** Outside or inside.  
**PRICE:** \$100.00 without accessories.  
**MANUFACTURER'S NAME:** LaMar Manufacturing Co., Inc.

**TRADE NAME:** Melco Supreme.  
**TYPE:** Two radio, detector and two audio.  
**TUBES:** Five.  
**BATTERIES:** None furnished.  
**CONTROLS:** Three.  
**AERIAL:** Outside or inside.  
**PRICE:** \$150.00 without accessories.  
**MANUFACTURER'S NAME:** Amaco Products, Inc.  
**NOTE:** The price of the slant panel type is \$165.00.

**TRADE NAME:** Magnavox receiving Set.  
**MODEL:** TRF-50.  
**TYPE:** Tuned radio frequency.  
**TUBES:** Five.  
**BATTERIES:** Not furnished.  
**CONTROLS:** Two.  
**AERIAL:** Outdoor or indoor.  
**PRICE:** \$150.00.  
**MANUFACTURER'S NAME:** Magnavox Co.



# BAIRD TELEVISOR



1930

Rudy Vallee, popular stage and radio entertainer, "looks in" on a television feature coming in through the television receiver

### Features of the Baird Television System

1. Small in size. Panel is only 15" x 15", permitting installation in a console no larger than a standard radio cabinet.
2. Universal in its application. Can be adapted quickly and easily for reception of 24, 45, 48 or 60 line pictures at speed of 15 or 20 pictures per second.
3. Synchronization on signal instead of on power line, making the speed of the scanner independent of variations in the power line frequency, voltage or load.
4. Receiver portion of the outfit may be used for both short-wave and broadcasting wavelengths by means of interchangeable plug-in coils.
5. Uses a resistance-coupled audio amplifier giving a comparatively low gain per stage, but free from interstage coupling and distortion, thus eliminating the need for expensive filtering arrangements.

DID YOU RECEIVE YOUR EDITION OF THE HORN SPEAKER?

The Post Office returned one of THE HORN SPEAKERS mailed first class because the name and address on the label was damaged beyond being able to read it. So, if you did not receive your edition, please let us know and we will send you a new issue.

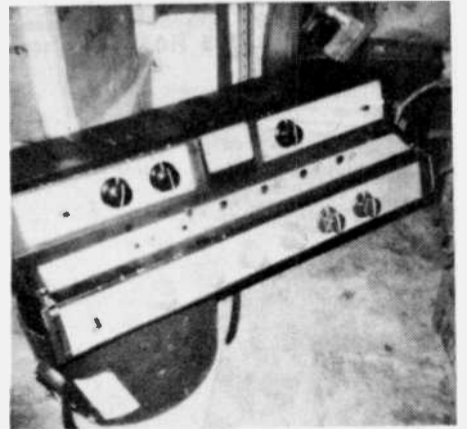
## flea market

ADVERTISE IN THE HORN SPEAKER  
Box 53012, Dallas, TX 75253 (lower price per square inch—compare)

AD SPACE:  
 Full page ..... \$75.00  
 Half page ..... \$37.50  
 Quarter page .... \$16.25  
 Business size  
 card ads ..... \$1.00  
 Space per square  
 inch ..... \$0.60

CLASSIFIED ADS .. 15 cents a word.  
(first 20 words free)  
PHOTO ADS ..... \$5.00 extra.

\*\*\*\*\*  
 \*\*\*\*\*SPECIAL\*\*\*\*\*  
 We will run your ad until you sell your merchandise through June 1987. Please notify us when you sell so that we can cancel your ad. If you want to run only as you specified, we will run it only that number of times. Thank you.  
 \*\*\*\*\*  
 \*\*\*\*\*



FOR SALE OR TRADE: CBS 190 COLOR SET 1953 uses 15GP22 in excellent original working condition.. Altec Lansing 230B mixing console near mint with original Altec book. Also have many 20's battery sets and horns. See wanted ad this issue. Ward Kremer, 301 SW 16st., Ft. Laud., FL 33315. (305) 772-1608.  
 \*\*\*\*\*

## MASKING DECALS AND NAMEPLATES

Ben Greener

The difficulty of spray painting around decals and nameplates can be overcome not only by tape but by art maskoid.

Art maskoid is applied with a pen or brush --extra suitable for fine detail. Brushes should first be wetted and soaped before dipping in art maskoid.

Allow to dry (approx. 5 min.) then spray over the maskoid. Remove by peeling or rubbing away with soft eraser.

Commercial art outlets are the best sources to buy the art maskoid.

I used the art maskoid to protect the decal when I was refinishing the bell on my Music Master horn Speaker.

## LETTERS

Jim;

I'm 79 years old and have been restoring antique radios for collectors, five of them for the past 4 or 5 years. Two of the collectors have more than 100 antique radios. I spent my whole life from 10 years until now, building, servicing and selling radios. Forty three years in business with radio and electric service.

Sincerely,  
Herb DeGarmo  
Early, Iowa

Dear Jim,

I really enjoyed the article by Paul Crum that appeared in your December 1986 issue. I first heard about Paul from a friend who met him back in the 1960s— this was when I first started collecting.

Best regards  
Lauren

SMALL ADJUSTMENTS TO COMPLETE REBUILD  
— OBSOLETE TUBES AVAILABLE —

---

**Antique Radios Restored**

---

MARK OPPAT  
"I HAVE CIRCUIT DIAGRAMS FOR ALL RADIOS  
1923-1950"

167 CASTER PLYMOUTH, MICHIGAN 48170      CALL 455-4169

*Wrote letter 2-23-87*

Everything being in readiness, the great moment arrived. The whole family gathered about to hear the wonderful wireless messages. For one hour nothing happened, and one by one the members of the family drifted away to less interesting but more positive forms of diversion. Suddenly, thanks to constant coaxing, the bell began to ring. It was a signal, no doubt. The decoherer did not perform its function, so it had to be jollied along. But each time the coherer was restored to its passive state, the bell would again ring. Surely these were signals.

Not Realizing the Importance of a Relay, I placed the Coherer in Circuit With a Simple Bell Arranged as a Decoherer. Then I discovered That Each Time My Neighbor Used His Hammer the Coherer Went Off. Hence My First Radio Messages Were Nothing More Than Hammer Blows.





\*\*\*\*\*  
 FOR SALE: BOOKS, MANUALS, Tubes from 1930's to 1970's at 75 cents each. SASE for lists. Bruce Harbeck, 13408 Westwood Lane, Omaha, NE 68144. Phone (402) 333-9013.  
 \*\*\*\*\*

RADIO! RADIO! Jonathan Hill has published the most complete book on British radios from Marconi to the 1960's. Almost 1000 photographs illustrate the 242 page 8 1/2" x 12" book. Cost: \$19.95 paperback, \$29.95 hardback, plus \$2.50 P&H. Howard Stone, 2825 6th Avenue, Fort Worth, TX 76110.  
 \*\*\*\*\*

AVAILABLE: DUPLEX PHONOGRAPH, \$4000/BO. Proposed deals involving pre-war TV's will receive priority. Jim Clark, 1 (517) 323-9595.  
 \*\*\*\*\*

FOR SALE: OLD QST AND ARRL RADIO HANDBOOKS. SEND SASE FOR LIST. K. M. MILLER, K6IR, 16904 GEORGE WASHINGTON DRIVE, ROCKVILLE, MD 20853.  
 \*\*\*\*\*

HIGH FIDELITY magazine, 1940s; MUSIC AT HOME, AUDIOCRAFT magazines; old RCA theremin, early oddball hi-fi stuff. Have trade items. Hal Layer, P.O. Box 27116, San Francisco, CA 94127.  
 \*\*\*\*\*

CAPEHART 112N2 has unusual record changer- \$325; Neutrowound Super 6 - \$185; Zenith 6S229 - \$85; AK-20 - \$75; and others. Rosenthal, 507 South Maryland Avenue, Wilm., DE 19804.  
 \*\*\*\*\*



RARE FIND— TAKING BIDS— TWO C. R. LEUTZ SUPER DX SEVEN — SUPER DX EIGHT — TYPE L SER. NO. 518— LONG ISLAND NY PROTOTYPES — EVERETT BERRY, C/O — 2008 E. SEWARD STREET, TAMPA, FL 33604.  
 \*\*\*\*\*

"FREE FOR LATEST FLYER, NO. 186D SEND 2 STAMP S.A.S.E. TO: OLDE TYME RADIO COMPANY, 2445 LYTTONSVILLE, MD 20910.  
 \*\*\*\*\*

ANTIQUE BEEHIVE WHITE INSULATORS - \$1.00 EACH — HEAVY DUTY T.V. REPLACEMENT TRANSFORMERS, NEW BOXED AT \$20.00 EACH. — 50 YEAR COLLECTION OF VACUUM TUBES LOW LOW PRICES. INQUIRE M. LEVY, 101 EAST DRIFTWOOD #44, FBG, TX 78624 TEL (512) 997-2534.  
 \*\*\*\*\*

VINTAGE RADIO AND RELATED LITERATURE. LSASE FOR LIST. FOTHE, 10 JACKSON STREET, SLOATSBURG, NY 10974.  
 \*\*\*\*\*

FOR SALE. SERVICE DATA, PARTS, TUBES, TEST EQUIPMENT. LIST #2-86. SASE. KRANTZ, 100 OSAGE AVENUE, SOMERDALE, NJ 08083.  
 \*\*\*\*\*

ACME 'ACMEFLEX' (1925, VG TO EXC, UNTRIED, BOTH AUDIOS OK) \$75 — PHILCO 43B (1932, EXP REF'D, WORKS) \$190 — PHILCO 70B (1931, NICELY REFINISHED, SMALL VENEER PATCH ON THE TOP REAR OF CABINET, WORKS) \$190 — BULB SHAPED TUBES AND RADIO BOOKS — SEND LARGE 2 STAMP S.A.S.E. FOR COMPLETE AND UP-TO- DATE PHOTO LIST. — RON BOUCHER, 376 CILLEY ROAD, MANCHESTER, NH 03103. (603) 669-1698.  
 \*\*\*\*\*

FOR SALE TUBE COLLECTION — LARGE SASE FOR LIST. BILL THOMPSON, 1095 NW 147 ST., MIAMI, FL 33168 (305) 685-1993.  
 \*\*\*\*\*

FREE some old time radio for SASE, new, super flyer completely revised. 4 pages of radio. Olde Tyme Radio, 2445 Lyttonsville Road, Silver spring, MD 20910  
 \*\*\*\*\*

CRYSTAL, TUBE EXPERIMENTER'S catalog - \$1.00 - None free. Sets, kits, handbooks, plans, coils, supplies, obsolete tube quotations. Laboratories, 1477-H, Garden Grove, CA 92642.  
 \*\*\*\*\*

FOR SALE: RIDERS 1 THRU 8 WITH INDEX, 300 OLD MAGAZINES, WIRELESS PARTS, 150 PANEL METERS, TEST EQUIPMENT, TELEGRAPH ITEMS, COMMUNICATION RECEIVERS, BROADCAST RADIOS, THOUSANDS OF PARTS, TUBES, MANUALS, SEND WANTS AND LARGE SASE OR CALL. FOR GOOD DEAL, YOU EYEBALL, YOU PICKUP. — BILL THOMPSON, 1095 N.W. 147 STREET, MIAMI, FL 33168. (305) 685-1993.  
 \*\*\*\*\*

50 YEAR COLLECTION HARD TO FIND TUBES: LOW LOW PRICES, INQUIRE, M. LEVY, 101 EAST DRIFTWOOD #44, FBG, TX 78624.  
 \*\*\*\*\*

SCOTT ALL WAVE RADIO w/ speaker and power supply \$275.00, Silver-tone 12" x 15" metal speaker \$15.00, 1910 Dictaphone Transcriber, shaving machine \$75.00, Radiola 28 on four legs, \$100.00, Radiola 25 w/loop \$55.00, Radiola 60 cabinet only w/jewel box made inside \$40.00, 12" x 12" rd. temple style speaker \$40.00, Magnavox R3 speaker \$65.00, Radiola 18 w/tubes \$40.00, Riders 10, 12, 13, \$10.00 ea., Plus U.P.S., Larry Chambers, 5026 Suter Drive, Nashville, TN 37211 (612) 833-2448.  
 \*\*\*\*\*

FOR SALE— UNUSED AND USED TUBES, CAPACITORS, speakers, etc. Send S.A.S.E. for lists. C. Elmer Nelson, 11 S. Church St., Princeton, IL 61356.  
 \*\*\*\*\*

PHILCO CATHEDRAL, AK 46, RADIOLA AR812, Radiola 18, Crosley Showbox, CASE, RCA T62, speaker AK-F4, quack home diathermy machine, B & K tube tester, wood cased test equipment, John Kendall, 600 Remington Road, Fallston, MD 21047. SASE for pictures and more information.  
 \*\*\*\*\*

FOR SALE. RIDERS, HOWARD SAMS, RCA, PHILCO, GE SERVICE MANUALS. TUBES, TEST EQUIPMENT, SPEAKERS,

KNOBBS, PARTS. SASE FOR LIST. KRANTZ, 100 OSAGE AVENUE, SOMERDALE, NJ 08083.  
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TRANSFORMERS— POWER— HEAVY DUTY— T.V. AND RADIO REPLACEMENT TYPES, STANCOOR AND MERIT, NEW BOXED AT \$20.00 EACH. LARGE COLLECTION VACUUM TUBES, LOW, LOW, PRICES. INQUIRE M. LEVY, 101 EAST DRIFTWOOD #44, FBG, TX 78624, TEL. (512) 997-2534.  
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FOR SALE— RIDERS MANUALS, ABRIDGED (VOL. 1-5) AND VOL. 6 THROUGH 16 \$275.00. VOL. 9, 10, 14 \$20.00 EACH. ANTIQUE RADIO SERVICE, O. H. McDONALD, 2535 WEDGLEA #124, DALLAS, TX 75211.  
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"RETIRED RADIO- TV SERVICEMAN SELLING OUT PARTS, TUBES, LARGE S.A.S.E. BRINGS LIST." N. McNALLY, 190 PERRIN, PAWTUCKET, RI 02861.  
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24 EXPERIMENTAL WIRELESS MAGAZINES, 1927, 1928, BEST OFFER, W. Z. THOMPSON, 1095 NW 147 ST., MIAMI, FL 33168. (305) 685-1993.  
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ELECTRON TUBES: Receiving, transmitting, microwave.. all type available. Large stock. Next day delivery, most cases. Daily Electronics, P. O. Box 5029, Compton, CA 90224 (213) 774-1255.  
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CHASSIS— RCA 88K, 8 TUBES, EYES, CLOCK- TYPE DIAL, 3 BANDS, SPEAKER, SOME RUST, \$30.00 — PHILCO 112, 11 TUBES, \$30.00 — MOTOROLA HS-253, 8 TUBES, AM-FM, LOOP \$20.00 — RADIOS —

AK-33, E3 SPEAKER \$60.00 — ZENITH 5R303, 5 TUBE AC, WOOD, PUSHBUTTONS \$20.00 — PHILCO E-812-124 YELLOW PLASTIC, 5 TUBE, AC/DC \$15.00 — SETCHEL - CARLSON 49-6, PAY RADIO, LESS COIN MECHANISM, 5 TUBE AC/DC \$15.00 — COMMUNICATION RECEIVERS — NATIONAL HRO-W, 5 COILS, POWER SUPPLY \$60.00 — HRO 5TAI, 3 COILS, POWER SUPPLY \$40.00 — NC-183D SPEAKER \$60.00 — HALLICRAFTERS SX-28, CABINET (NO CHROME) \$60.00 — HEATHKIT AR-3 \$15.00 — HEATHKIT HR-1680, SPEAKER \$30.00 — TEST EQUIPMENT — RIDER CHANALYST, PROBES, MANUAL \$40.00 — PRECISION E-200-C GENERATOR, MANUAL \$20.00 — ALL COMPLETE WITH TUBES, SHIPPING EXTRA. JOE WATSON, 3300 ARROWHEAD CIRCLE, ROUND ROCK, TX 78681 (512) 255-7962.  
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FOR SALE: TEST EQUIPMENT for radio and telephone. SASE for TE list. Serge Krauss, 141 Homan Avenue, Elkhart, IN 46516.  
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FOR SALE: RADIOS, PHILCOS & RCA cathedrals, Kennedy, Radiolas, Atwater Kents, King and others. No. 199 radio tubes and others. Clifford Schoen, 549 Fulton Street, Seymour, WI 54165. Phone (414) 833-2429.  
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FOR SALE: TEST EQUIPMENT for radio and telephone. SASE for TE list. Serge Krauss, 141 Homan Avenue, Elkhart, IN 46516.  
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FOR SALE 20 SW SETS— LIST SW87. PARTS, TUBES, SERVICE DATA, TEST

EQUIPMENT, SASE FOR LIST E86, HARD TO GET TUBES, AK BB PARTS, TUBE SAGA, RADIO NEWS 1920 - 1945. SASE FOR LIST # OFFER 1987. PLUS MORE. KRANTZ, 100 OSAGE AVENUE, SOMERDALE, NJ 08083.  
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LONG ISLAND ANTIQUE RADIOS— For sale and repair. All prices. Reasonable, come to AA Electronics, 178 I. W. Willets Road, Albertson, NY; 11542 at Albertson R. R. Station. Call first, (516) 741-4212.  
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CONSOLES— 10 NICE RADIOS FOR SALE. PHILCO, RADIOLA, MARSHALL, MAJESTIC, KELLOG — SASE FOR LIST. RUSS OLMSTED, 608 W. THOMPSON LANE, MURFREESBORO, TN 37130.  
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ROTARY SPARK GAP, medium power. Works fine. \$95; Hallicrafters S-85 Receiver. Excellent. \$85; Three coil mount with honeycomb coils. \$45; Bodine loop antenna. Beautiful. \$75. All plus UPS. Paul C. Crum, W9LC, 6272 N. Cicero Avenue, Chicago, IL 60646. 1 (312) 282-3033  
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INDIANA HISTORICAL RADIO SOCIETY information and membership application send SASE to: IHRS, 245 N. Oakland Avenue, Indianapolis, IN 46201  
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FOR SALE— 3 AERO COIL SHORT WAVE REMOVEABLE COIL TUNERS. 1945 RADAR BOOK U.S. AIR FORCE. TRANSMITTER CRYSTALS. U.S. AIR FORCE W42 PHOTO. 1913 MICROPHONE. TRANSMITTER TUBES 12 IN. LONG. RUSSELL SCHOEN, R #1 BOX 224, CLINTONVILLE, WI 54929. (715) 823-6744.  
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FOR SALE: PHILCO 87. ZENITH 10S160. Silvertone R101. Crosley fiver. Crosley 515. Airline "Movie Dial" and others. List. WOIAZ, P. O. Box 141, Goodman, MD 64843. (417) 364-7936.  
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AMATEUR RADIO RECEIVERS AND TRANSMITTERS — MAGAZINES — TUBES PHOTOS — .50. SASE FOR LIST — SEND YOUR WANT LIST. K4UJZ, RUSS OLMSTED - 608 W. THOMPSON LANE, MURFREESBORO, TN 37130.  
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 FOR SALE: HALLICRAFTERS SKY- RIDER JR., MODEL S-41-G, FAIR CONDITION, WORKS, WILL SHIP FOR BEST OFFER. LOUIS YADAVIA, 601 CHURCH LANE, UPPER DARBY, PA 19082.

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 RIDERS 1 THRU 8 WITH INDEX. FAIR. WESTON 785, EXCELLENT, LEADS, MANUAL, OAKCASE. MAKE OFFER OR CALL. BILL THOMPSON, 1095 NW 147 STREET, MIAMI, FL 33168. (305) 685-1993.

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 RCA CT-100, fully restored 1954 COLOR TV, Bill Russell, 3236 Laurel Canyon, Santa Barbara, CA 93105. (805) 682-8115. Send \$1.00 and SASE for color picture.

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 NEW BOOKS ABOUT OLD RADIOS, PHONOGRAPHS. 6 page catalog. Long SASE to Sound Box, Dept. HS, Box 226, Ettrick, WI 54627.

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 FOR SALE, NEW AND USED RADIO TUBES. Late 1920's thru early 1940's. SASE for list. FOTHE, 10 JACKSON ST., SLOATSBURG, NY 10974.

\*\*\*\*\*  
 FOR SALE—SCOTT—RADIO—MINT—800B—ALL ORIGINAL, Details included. Buyer pays delivery. \$650.00. Tel. (216) 481-0226. Frank Hoffert, 19605 Chardon Road, Cleveland, OH 44117.

\*\*\*\*\*  
 FOR SALE; UNUSED AND USED TUBES, capacitors, speakers, etc. Send SASE for lists. C. Elmer Nelson, 11 S. Church Street, Princeton, IL 61356.

\*\*\*\*\*

## WANTED

WANTED HALLICRAFTER SX-71 OR NATIONAL NC-183 in excellent condition. Please state price and condition when corresponding. Roy Schmitt, Rt. 1, Box 800 Lot 84, Converse TX 78109 (512) 659-0094.

WANTED: DISK CUTTING EQUIPMENT, Rek-O-Kut, Presto, Meumann, etc. Also need idler wheel or measurements for Federal PR-12 disc cutter. Old pro mikes RCA 44's, 66's, AKG, etc. Ward Kremer, 301 SW 16st., FT. Laud., FL 33315, (305) 772-1608.

### NOTICE

SPRING SPECIAL — through June 1987. Please specify on your ad if you want to run them until you find the item and notify us when

you do (limit 6 months or less). If not, please specify the limit on the number of months you want the ad to run before all the readers of THE HORN SPEAKER.

WANTED: B-ELIMINATOR, 01A tubes; quote prices, specifications. T. C. Day, 215 West 7th Street, St Waynesboro, PA 17268.

TELEVISIONS BOUGHT! Buying 12" and smaller pre 1950 sets, plus Predictas, early color, etc. Paying \$40-350. Buying pre-WW II TV's—TRK's, Dumont, TT5's, Fadas, more. Paying \$1200-4000! Books, TV novelties—wanted. Harry Poster, Box 1883, So. Hack., NJ 07606 (201) 794-9606.

WANTED: DUMONT TELEVISION, table model with continuous tuning and FM. Jack Kashak, 139 E. Saemann, Chesterton, IN 46304. (219) 926-7240.

WANTED: EDISONIC D. D. REPRODUCER. Edison antique finish dance reproducer — picture records — record dusters — Contact: Jimmie Grissom, 246 Keene Street, Henderson, NC 27536.

WANTED: CABINET TOPS FOR RADIOLA 20 or 25 and 104 speaker unit. DeForest tubes and cans, early tubes and light bulbs. Bruce Harbeck, 13408 Westwood Lane, Omaha, NE 68144. (402) 333-9013.

WANTED: WOOD FRONT PANELS for Radiola 20, large tuning knobs for A.K. 35. Mark Oppat, 167 Caster, Plymouth, MI 48170.

RUSS'S OLD RADIO MUSEUM WANTS OLD AMATEUR TRANSMITTER AND RECEIVERS, MAGAZINES, TUBES, BOOKS, KEYS, ETC. IN THE 1920'S-30'S. I HAVE A LIST OF FOR SALE ITEMS. — PLEASE TELL ME YOUR WANTS. — SEND A SASE. K4UJZ, RUSS OLMSTED, 608 W. THOMPSON LANE, MURFREESBORO, TN 37130.

S.A.S.E. is a self addressed stamped envelope.

WANTED COAXIAL OR TRIAXIAL SPEAKERS of Jensen, Trusonic, Tannoy, Altec 604's. Western Electric equipment (tubes, amps., drivers, horns, speakers, microphones and parts). Radio tubes (50's, 211, 845, 8005) David Yo, P. O. Box 832, Monterey Park, CA 91754. Tel. (818) 576-2642.

CATHEDRAL RADIOS, MUST BE NICE AND WORKING CONDITION. WILL PAY TOP DOLLAR. ALSO WANT OTHER UNUSUAL AC RADIOS. HAROLD PERKINS, 4468 SUN VALLEY DRIVE, LAS VEGAS, NV 89121.

WANTED — RCA CREDENZA'S, Edison windups — speaker systems and components, JBL Hartfield, Paragons—Altec Laguna, Magnificent, 515A/B, 288B/C, 604B/C/D/E, E.V. Patricians, Tannoy Autograph, GRF — Red/Silver/Gold, Jensen G610, Western Electric theatre equipment, speakers, drivers, horns, electron tubes, mixers, x-formers,

x-overs, tubes, round top 45, 50 — W.E. 252A, 300A/B, 350B, etc. Charles Dripps, 4331 Maxson Road, El Monte, CA 91732. (818) 444-7079.

WANTED — GRANDFATHER CLOCK RADIO and Radiola IV. Gordon Wilson, 11108 - 50 Avenue, Edmonton, Alberta, Canada, T6H 0H9

WANTED— OLD 1960s or 70s large Allied Radio Catalogs. Earl Phillips, 311 David Lane, Maryville, TN 37801.

WANTED: BOOKS; buy, beg, borrow, rent or steal. Twining, "Wireless Telegraphy and High Frequency Electricity;" Curtis, "Construction of Induction Coils & Transformers;" Collins, "The Amateur Electrician's Handbook;" and other books with Tesla coil projects. Need data for forthcoming bibliography. TCBA, RD 3, Box 181, Glens Falls, NY (518) 792-1003.

WANTED— INSTRUCTIONS FOR OPERATING Hickock tube tester model # 600-A plus supplement tube data sheets. Zerox copies OK. Frank Hoffert, 19605 Chardon road, Cleveland, OH 44117. Tel. (216) 481-0226.

WANTED— OLD 1960s or 70s large Allied Radio Catalogs. Earl Phillips, 311 David Lane, Maryville, TN 37801.

WANTED— FOUR WIRE OSC. COIL 266KC or Philco part 322828. Don Aldred, 39 East 8th Street, Jacksonville, FL 32206.

URGENT— URGENT— NEED PART FOR VOLUME CONTROL FOR AK BREADBOARD MODEL 10. STRIP THAT HAS WIRE WOUND ON INSIDE OF CONTROL. RUSS SCHOEN, R#1, CLINTONVILLE, WI 54929.

WANTED: INFORMATION OR EQUIVALENT CHARTS ON MUTER BRAND BALLAST TUBES. OLD CATALOGS MAY LIST THEM. ANTHONY JACOBI, 8053 MAYWOOD, RALSTON, NE 68127.

WANTED — New or used OAZ voltage regulator tubes. Need 1200, must be reasonable. Tom Burgess, Box 9769, Little Rock, AR 72219 — (501) 565-1750 evenings.

WANTED: GRANDFATHER CLOCK RADIO, AK, Philco, etc. Gordon Wilson, 11108 - 50 Avenue, Edmonton, Alberta Canada T6H 0H9.

AMATEUR RECEIVERS— GREBE, HAMMARLUND, NATIONAL BREITING, HOWARD, HALLICRAFTER, ALSO EARLY QST'S, HANDBOOKS, CRYSTAL SETS. K4UJZ, 608 W. THOMPSON LANE, MURFREESBORO, TN 37130.

RADIOLA Balanced amplifier— RADIOLA IIIA. whole— parts— junk. State price and condition when corresponding. B. Block, 2118 Winn, Kemah, TX 77565.

WANTED — TWO WINDING OSCILLATOR COIL, 265 kc I.f. frequency badly needed. For sale Thompson flybacks and yokes, two thru 167. \$12.95

postpaid. — Don Aldred, 39 East 8th Street, Jax. FL 32206.

RADIOLA ITEMS WANTED: Vocarola, RE, AR, Concert Receiver; Radiola IV, VI, VIIIB / IX grand; any of AA series. CASH OR TRADES. Rosenthal, 507 South Maryland Avenue, Wilmington, DE 19804

WANTED: SET OF RIDER MANUALS, Vol. 1 thru 8. Must be realistic price. Michael Sabodish, 11A Matawan Avenue, Cliffwood, NJ 07721. (201) 566-1486.

HR-3 RCA ELECTRON TUBE HANDBOOK. Industrial, receiving and transmitting tube technical bulletins by GE, Sylvania, etc. Nick Tusa, K5EF, 129 Somerset, LaPlace, LA 70068 (504) 652-4904.

WANTED: LARGE HIGH VOLTAGE VARIABLE CAPACITOR. TCBA, RD 3, Box 181, Glens Falls, NY 12801

INFORMATION NEEDED— Who can identify the speaker unit for me on the front cover of THE HORN SPEAKER, May 1986 issue? I also need a base for same with or without driver. All replies acknowledged. Bill Stuber, P. O. Box 153 (406 S. 1st Avenue), Woodward, IA 50276 515# 438-2008.

WANTED: COLORFUL "CATALIN" plastic radios; Fada, Emerson, Dewald, Addison, etc. Top prices paid. Mint condition only. R. W. Oliver, 355 Highwood Avenue, Leonia NJ 07605 (201) 944-0777.

WANTED— ANY McMURDO SILVER ELECTRIC set with or without cabinet. Masterpiece I, II, III, IV, V, VI 14-15, 15-17. Any literature, McMURDO SILVER TIMES or FORUM. Magazines. Also 1935-1939 Zenith consoles. We pickup most areas of U. S. and Canada. Frank and Mary Rasada, 12507 Pinegrove Lane, Cerritos, CA 90701. Days: (714) 951-9591. Evenings: (213) 926-6722, leave message for return call.

WANTED— INFORMATION / DATA on the "SHELDON RADIO COMPANY" that was active in Los Angeles 1925-1931. Ed Sheldon, 656 Gravilla Place, La Jolla, CA 92037.

WANTED: SILVERTONE MODEL 4500A, black plastic table model— only interested in cabinet. Tom Johnson, 215 E. 7th Street, Ames, IA 50010.

WANTED: INFORMATION ON PEERLESS wireless, Milo Bailey, Thomas E. Clark (TECLA), and any other pre 1930 Michigan manufacturers: brochures, ads, articles, photocopies ok. Tips welcomed. Oran Sauder, 316 Wellington, South Lyon, MI 48178. (313) 437-4413.

SPARK EQUIPMENT— Especially 25,000 volts Commercial Spark Condenser; Rotary gap or complete sets. Paul C. Crum, 6272 N. Cicero Avenue, Chicago, IL 60646. 1(312) 282-3033.



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WANTED: RADIO CORRESPONDENCE course kits. AC or battery. Leo Teply, geddes, SD 57342.

WANTED: DON'T THROW AWAY THOSE ELECTROMECHANICAL POWER SUPPLIES AND PARTS 6 VOLT AND 12 VOLT VI-BRATORS, OZ4's, TRANSFORMERS, CASH PAID OR TRADES. MARVIN ROTH, 14500 LaBELLE, OAK PARK, MI 48237 (313) 399-5993.

A GERMAN MADE RADIO. Small table model— working condition. Phone or write. PETERSONS, 3115 North 61st Street, Lincoln, NE 68507. (402) 466-7548.

HALLICRAFTERS SX-88, parts or junker. Gene Mottern, 313 Royal Drive, Kingsport, TN 37663.

WANTED: A.K. BREADBOARD PARTS; antenna coils, type 11 tuner coil-tube unit, detector unit, potentiometers, 3 tube detector amplifier unit, switches, highest prices paid. Delwitt L. Bills, 5237 Upton Avenue North, Minneapolis, MN 55430. (612) 521-7109.

WANTED: LARGE HIGH VOLTAGE variable capacitor. Books and magazines on electricity, medical electricity and wireless telegraphy. Want list available. TCBA, RD3, Box 181, Glens Falls, NY 12801.

WANTED: LID FOR RADIOLA 20 and ATWATER KENT 20C, power supply for U.S. Radio and Television model 80. Richard Peterson, 3940 Lolan Ct., Marrero, LA 70072.

WANTED— A COPY OF SCHEMATIC for portable radio. R.E. 8000 - Ross Electronics and Manual. Michael J. Doback, 592 Southlawn, Birmingham, MI 48009.

CHELSEA MODEL 102 AF transformer, working or not. Will buy junker set to get one. Transformer name-plate says Songbird Midgie. P. A. Kinzie, 713 E. Beale Street, Kingman, AZ 86401.

WANTED: FANCY LOOKING GRANDFATHER CLOCK RADIO. Also AK models 558, 217, 165, 246, 944. Also Radiola IX, Airline 20 and Philco 20B.

Need dud WD11 tubes. Gordon Wilson, 11108-50 Avenue, Edmonton, Alberta, Canada T6H 0H9.

WANTED: SILVERTONE MODEL 4500A, black plastic table model— only interested in cabinet. Tom Johnson, 215 E. 7th Street, Ames, IA 50010.

WANTED: RADIOLA X CHASSIS FOR PARTS. Gordon Wilson, 11108 - 50 Avenue, Edmonton, Alberta, Canada T6H 0H9.

TV's BOUGHT — NEED 10", 7", etc. — pre 1950+ Predictas, early color, paying \$40 - \$350. PRE- WAR TV's - TT5, TRK, LOTS MORE - \$1200 - \$4000. Books on TV's, pre 1948. Harry Poster, Box 1883H, So. Hack., NJ 07606. (201) 794-9606.

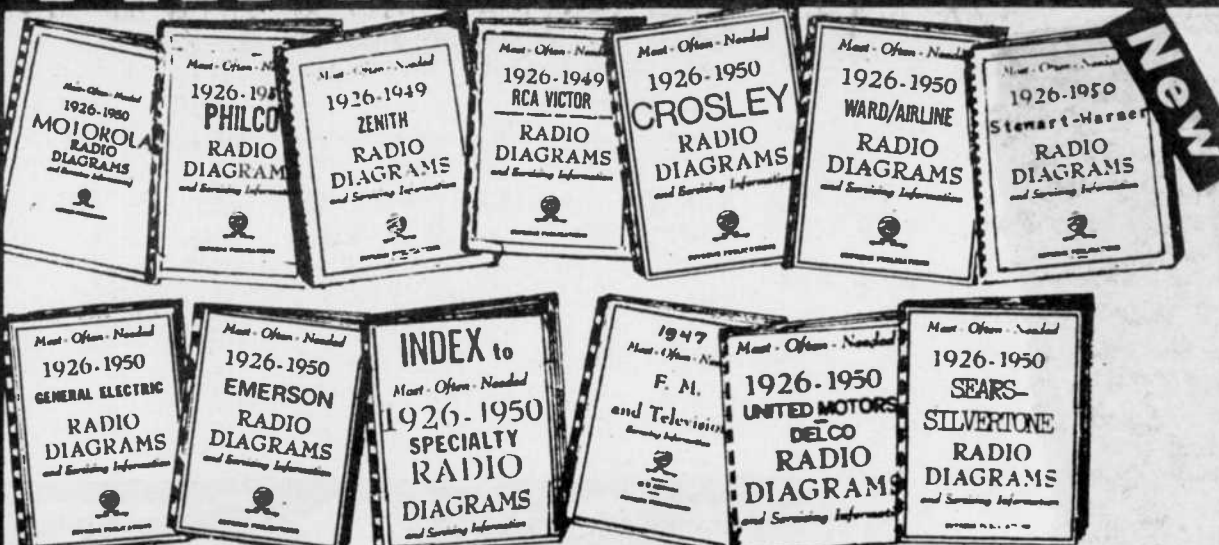
WANTED— WIRING CIRCUIT for RADIODYNE WD17- 5 tube radio, made, (Western Coil and Electric) Co., Racine, Wisconsin, a copy, a tracing or anything to get the

wiring hookup. Herb DeGarmo, 203 3rd Street, Early, IA 50535.

WANTED: PHILCO 60 CHASSIS. Rheostat knob for a Crosley 51. Marc Ingenthron, 9215 W. 83rd Street, Overland Park, KS 66204.

WANTED: DRIVER AND METAL PARTS FOR MUSICMASTER HORN SPEAKER. HALLICRAFTER SX-17 AND SPEAKER. CHARLES FURTA, 241 OAK, ELMHURST, IL 60126.

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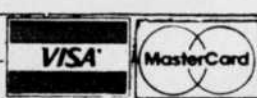
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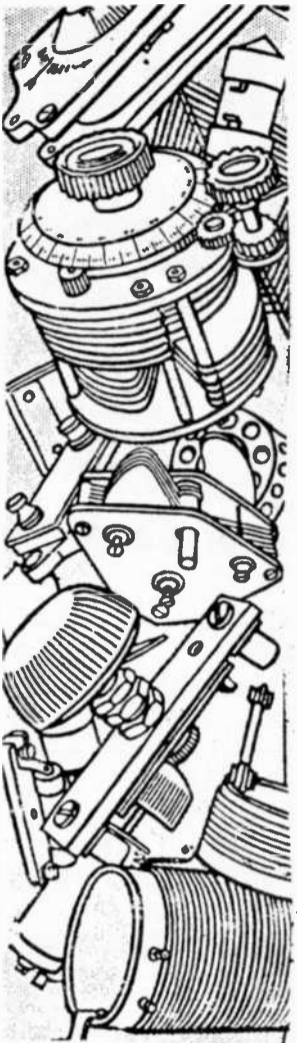
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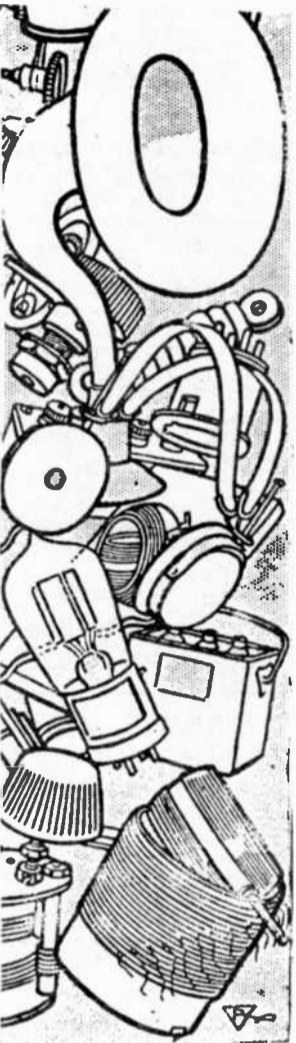
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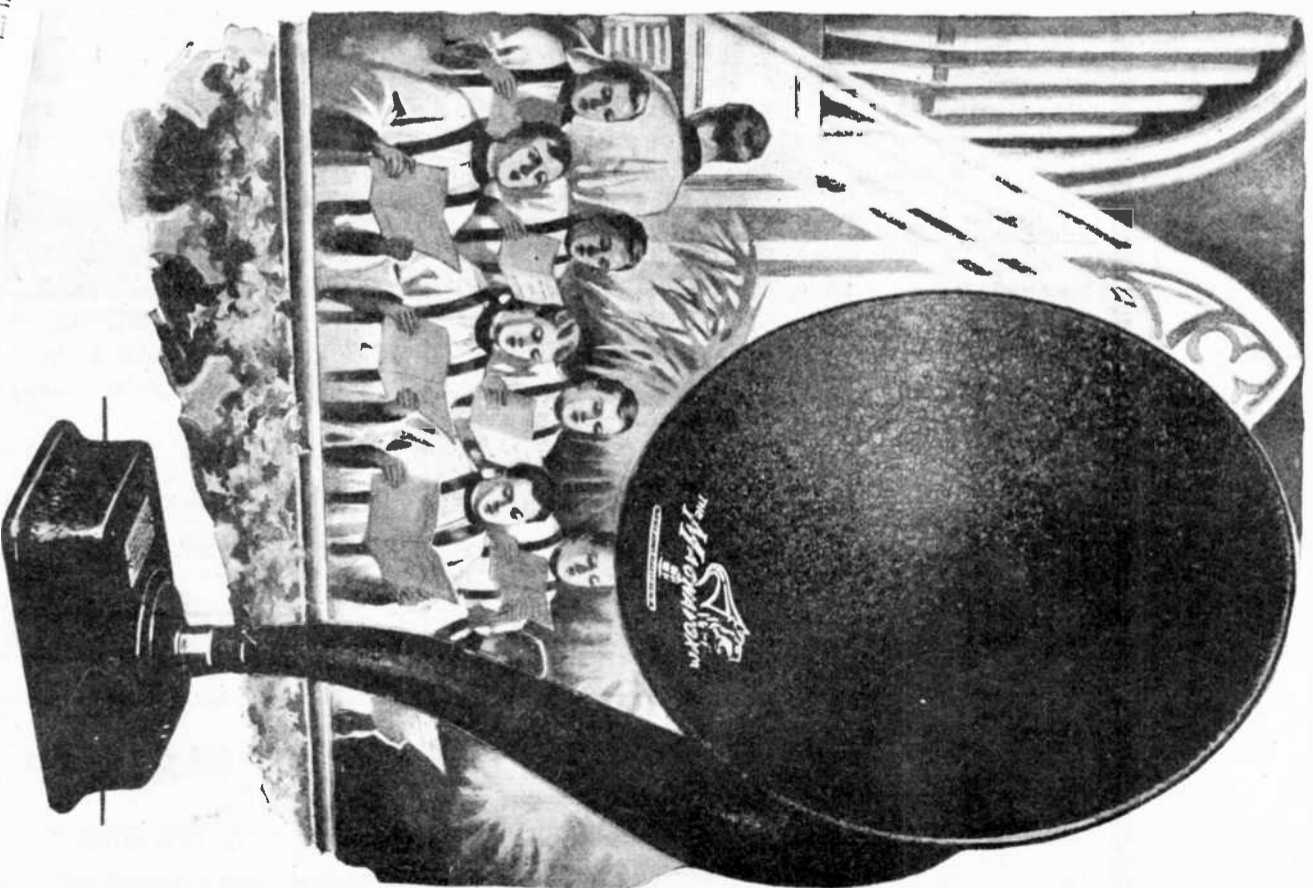
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February

# THE HORN SPEAKER

1987



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