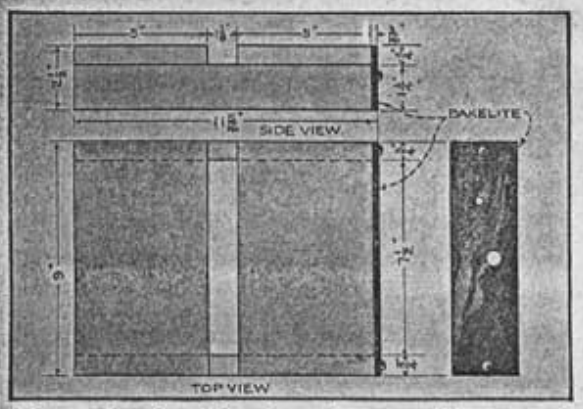


Figure 1. Specifications for wood base and bakelite control panel

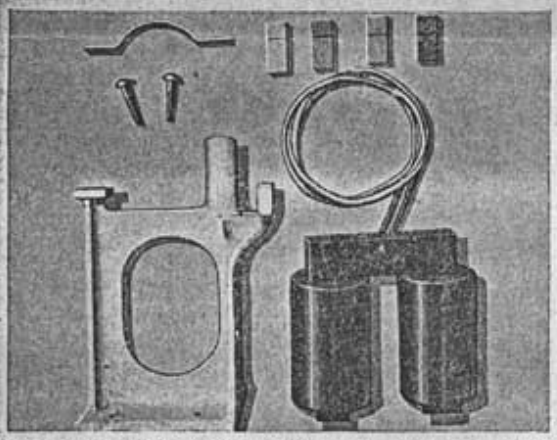


Figure 2. Parts for rear bracket assembly

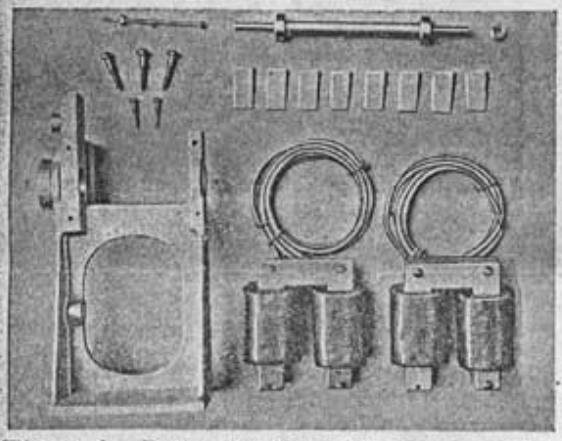


Figure 3. Parts for front bracket assembly

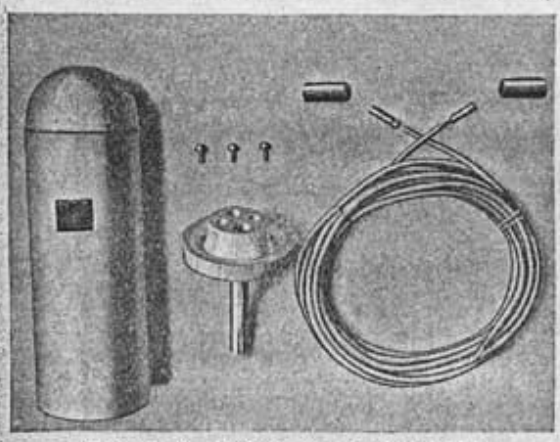


Figure 4. Neon lamp assembly

Building a

A simple and inexpensive radiovisor which serves as a fitting mate for the

IT is the duty of the radiovisor to convert the received radio impulses of the television transmitter into visual images as it is the duty of the loud speaker to convert the radio impulses of the sound transmitter into sound. Last month we discussed the construction of the receiver proper for a television receiving installation. In this article we will discuss the radiovisor.

As is also true of loud speakers, there are many types of radiovisors, most of them operating on the same general principle. If the reader has constructed the short-wave receiver described last month, no doubt he is eager to add the radiovisor equipment so that he may look in on the programs listed in the daily papers. If Mr. Setbuilder has not the patience to assemble his own radiovisor from the kit of parts described here, he may purchase the complete equipment either in an attractive walnut cabinet or without one. Although this article is written especially for the home assembler, the purchaser of factory-assembled equipment will find the following instructions useful for the operation of his radiovisor.

How the Radiovisor Works

Essentially, the radiovisor consists of a neon lamp, a scanning disc driven by a motor and a lens which magnifies the image. To this may be added the self-synchronizer, a device which automatically keeps the scanning disc of the receiver in step with that of the transmitter. The neon lamp glows bright and dim in accordance with the modulation or variation of the incoming signal, the shadows appearing dark, the highlights light. The glowing neon lamp is seen through the minute holes arranged in a spiral around the edge of the disc. Only a single dot of light appears at a time, corresponding to one hole of the disc, but as the disc revolves, the dot of light takes the form of a horizontal line. Then the next hole appears, taking the shape of another line directly below the first one. The speed with which the disc revolves and the persistence of vision make it appear that all the 60 lines, equivalent to the 60 holes in the disc, are seen at once in a solid frame of light. The scanning disc is revolving in exact step or synchronism with the transmitting scanner.

The Jenkins Television Corporation manufactures three distinct types of radiovisors, to meet the three different classes of buyers. The cabinet model with scanning drum (instead of a disc) and automatic synchronizer has been designed for living room use. The completely assembled radiovisor without cabinet will receive the programs perfectly, while its parts are accessible for changes and additions in keeping with the advance of the art. The radiovisor kit resembles the second model when assembled, but is designed especially for those who wish to build their own radiovisors at the lowest possible cost. Let us assemble one of these kits.

*Jenkins Television Corp.

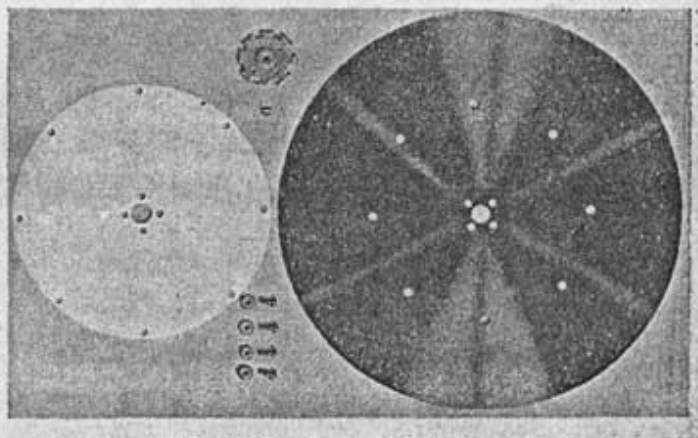
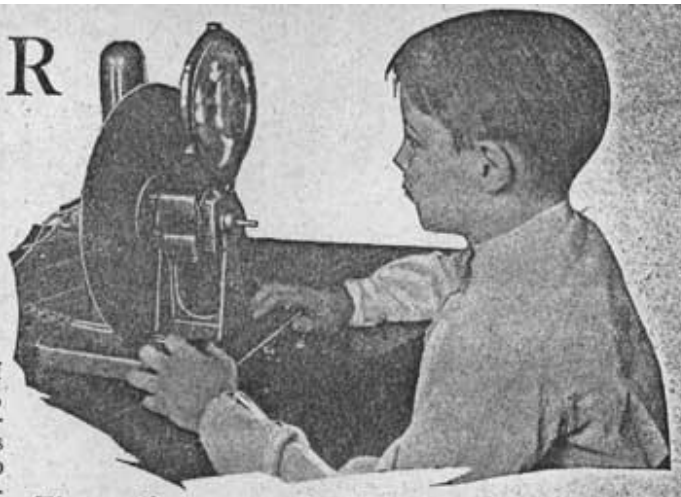


Figure 5. Scanning disc parts

RADIOVISOR

which is easy to build at home and television receiver described last month

By D. E. Replogle*



The radiovisor completed and in operation. The model shown here differs from the one described only in the use of a metal base instead of wood

Beginning with the platform or base, cut two blocks of white pine, maple or other wood that can be readily worked, each measuring ¾ x 5 x 9 inches. The pieces should be carefully planed and perfectly square. Then cut two more pieces measuring ¾ x 1¾ x 11⅛ inches each. Next a bakelite strip should be cut, measuring 2½ x 9 x 3/16 inches and the necessary holes drilled as indicated in Figure 1, which also shows the wood strips of the base.

Assemble the platform by placing the smaller wood strips on edge and bridging the larger blocks across them, allowing a space of 1⅛ inches between the larger blocks of wood. The pieces should be accurately and neatly fitted and nailed in place. The bakelite strip is now placed across one end, screwed to the end of the wood strip to form the control panel as shown in the completed assembly views of the radiovisor.

The template supplied with the kit is now placed on the base with the edge marked front facing the control panel. The proper holes have already been marked on the template which fits neatly to the edge of the wooden base. The holes as indicated on the template should be drilled through the wooden base. The platform is now ready for wiring.

Assembling the Parts

Figure 2 shows the components of the rear bracket assembly; the rear bracket, the rear electromagnet, the coil wedges and the rotor guard. The first step in the assembly of the rear bracket is to place the bracket upright on a table. The rear electromagnet is placed on top of the bracket with open end of magnet straddling the center post of the bracket. Next place the rotor guard on top of and across the open end of the magnet core. Align its holes with those of the pole piece and bracket, and slip through screws and tighten. Tighten the remaining magnet screw. Each coil should be pushed back as far as possible against the cross piece of the core. The wedges are then carefully inserted in the inside of the core, one facing the side of the coils, another facing the top of the coil. This precaution prevents noise when the radiovisor is in operation.

The assembly of the front bracket follows next. Figure 3 shows the parts of the front bracket: front magnets, front brackets, rotor spacer, shaft assembly, coil wedges, bearing clamping screws and the necessary screws and nuts for the assembly.

To begin assembly, place the front bracket on its base, upright, on the table. Place on electromagnet against one side, noting that the open end straddles the rounded bearing holder of the bracket. Keep wires or leads outside. Drive home screws that hold the magnet in position. Do likewise with the other electromagnet. Push the coils as far back as possible against the cross member of the magnet core and drive in wedges to hold coils tightly. Insert the rounded end of shaft and bearing through that end of the front bracket that is slotted through to the bearing hole. Push the shaft assembly as far as it will go, so that the ball bearing nearest the rounded end fits snugly in the boss at the far end of the bracket. If preferred, the shaft assembly may be put in place before assembling the coils on the front bracket. The ball bearings should be flush at both ends of the bracket. Draw up tightly and screw through the empty holes in the cores which are aligned with holes in the slotted bracket arm. Apply lock washer and screw. It is very important that the shaft be free enough to be spun with the thumb and first finger.

The Neon Lamp and Scanning Disc

Figure 4 shows the parts that are to be used in the neon lamp house assembly, consisting of the lamp shield, the base of the lamp shield, the lamp shield screws, the prong jack sleeves for establishing contact with the neon lamp prongs and the rubber-covered leads. The three felt cushions supplied should be cemented to the inside of the lamp house. The cushions prevent chatter due to the neon lamp vibrating against the lamp house. To assemble the lamp house simply place the neon lamp in the socket with the (*Continued on page* 233)

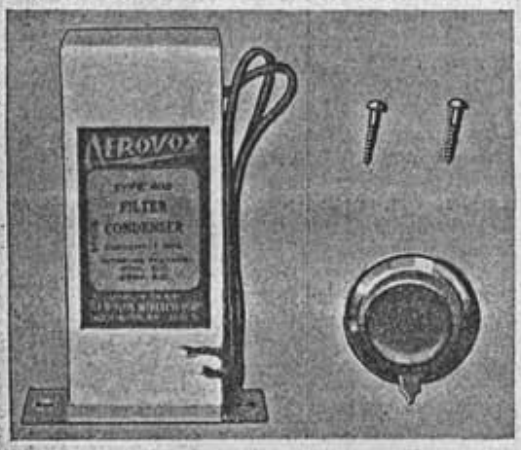


Figure 6. Control panel parts. Switch may be added if desired.

Figure 7. Method of mounting neon lamp

Figure 8. Rear view of completed radiovisor

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(*Continued from page 209*)

smooth surface facing the looker-in. Place the shield over the lamp, with window or opening aligned with plate of lamp. Align screw holes of shield with those of lamp socket member, insert screws and tighten. The lamp house is now complete.

Figure 5 shows the components of the scanning disc assembly, consisting of the scanning disc, rotor, copper hub flange and screws.

To assemble the sixty line scanning disc, hold the black disc in the left hand with the side of the disc facing the assembler which shows the spiral of tiny holes running clock-wise towards the center. Place copper hub flange at the back of disc, aligning its holes with those in the back of the disc. Drive home screws. Place rotor on side facing the assembler, align holes with those on center of disc and insert flat headed screws in rotor, through disc and copper hub flange, slipping nuts on rear side and drawing up tightly. The sixty line disc assembly is now complete.

The components of the motor controls can be clearly seen in Figure 6. These consist of rheostat, fixed condenser and the screws to hold the latter in place. These parts are mounted on the under side of the platform or base. A small toggle switch, such as is employed for the usual socket power radio set, is desirable but not essential for the starting and stopping of the motor. Mount the condenser on the under side of the platform, under the wood block adjacent to the bakelite panel, screwing the condenser to the left-hand upright board. The rheostat is mounted in the 13/32 inch hole on the right side as viewed from the front of the panel. The switch, if employed, is mounted in the 9/16 or middle hole intended for that purpose.

Mounting the Components

The major components of the radiovisor have now been assembled and are ready for mounting on the platform. First the front bracket is mounted, with the rounded end of the scanning disc shaft facing the front or panel end of the platform. It will be noted that small holes already drilled in the platform precisely align with the three small holes in the bracket base, while the large-hole aligns with the larger hole in the platform for the passing through of certain wires.

Next, the scanning disc is mounted on the shaft protruding from the rear of the front bracket. The rotor spacer is slipped over the square end of the shaft and pushed back against the ball bearing. Then the scanning disc is slipped over the shaft and pushed back against the spacer, after which the set screw in the rotor is tightened.

The rear bracket is now placed on the platform and so positioned that its holes align with the holes already drilled in the platform. The pole pieces and rotor guard should now surround the motor. The screws are driven home through the

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(*Continued from page 233*)

bracket base into the wooden platform. The scanning disc should be twirled to make certain that it turns free and that the rotor does not rub against the coils or the core of the rear magnet. About 3/16 inch is the proper distance between the front of the scanning disc assembly and the ends of the front magnet. The rear magnet core and back of scanning disc are about 3/16 inch apart.

The lamp housing shown in Figure 7 is mounted on the rear bracket by inserting the long pin of the lamp socket in the hole in the center post. The pin or protruding portion of the lamp socket permits raising or lowering of the lamp, or turning it from side to side, in order to frame the picture.

The magnifying lens assembly, as shown on the finished radiovisor, does not come with the kit but can be purchased separately and easily put on the front of the radiovisor by placing the lens in its holder and screwing the assembly onto the front of the radiovisor.

The wiring of the radiovisor is very simple, provided the wiring diagram which accompanies the kit is followed precisely. The leads have been colored for convenient identification.

Operation

The wiring completed, the radiovisor is ready for attachment to the shortwave receiver, described last month.

This accomplished, connect the shortwave receiver to a speaker in order to facilitate the tuning of the television signal, which may be audibly recognized by the steady pitched buzz of the television transmitter. When the signal has been tuned into maximum volume and clarity it may be transferred to the radiovisor. The neon lamp should glow when it is connected to the output stage of the receiver. The motor is turned on, and as the scanning disc gains speed the image will appear. The scanner is kept at the proper speed by means of the rheostat and snapping the switch off and on several times, while the picture is framed by moving the lamp housing vertically or turning it horizontally.

Synchronization is the most important term in the adjusting of the radiovisor. The images as viewed may lean to the left or right, depending on the scanning disc gaining on the transmitted image, or falling behind. To get the disc in perfect synchronization with the transmitted image, the speed control rheostat should be turned to the left or the right until the desired effect is obtained. It is possible to hasten the synchronization by pressing lightly on the protruding scanning disc shaft at just the right time and place. A little experimenting with the controls of the radiovisor, and the operator will get the knack. The self synchronized radiovisors with shadow boxes will be discussed in a future article in RADIO NEWS.

The experimenter is not "telewise" until he understands the operation of his set. If the set does not work properly

(*Continued on page 241*)

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(*Continued from page 235*)

the symptoms should be examined. For the benefit of the novice the following list of symptoms, diagnoses and cures is given:

Television lamp glows on reverse side.—Rubber-covered leads wrongly connected to receiver or power amplifier. Reverse the connection.

Television lamp fails to glow.—Insufficient output voltage. This symptom is not possible when the radiovisor is used in conjunction with the Jenkins Television Receiver.

Excessively bright screen, lacking in shadows.—An indication of excessive voltage applied to television lamp. A suitable high (variable) resistance should be placed in the plate circuit of the power tube or in series with the neon or television lamp.

Signals tuned in cannot be reproduced.—Off-standard signals are being picked up such as 45 or 48 line pictures. These cannot be reproduced on the standard scanning disc of sixty lines revolving at twenty complete frames per second. Forty-eight line discs may be secured for tuning in such stations as still transmit 48 line images. For the most part, a 60 line 20 frame per second picture is considered standard in television circles.

If the reader has followed the instructions given in this article and the one previously published in RADIO NEWS concerning the building of the shortwave television receiver, he has constructed a very good television receiving station. He may expect good images within a radius up to several hundred miles, depending on local reception conditions, with regularity. A number of enthusiasts report that they received regular images from the New York, Boston and Washington stations. Others have reported having seen these stations up to twelve and fifteen hundred miles. At the present time a number of new stations are waiting to be licensed by the Federal Radio Commission and as these are to be located in widely different parts of the country the time is near at hand when television programs will reach even the most remote parts of the country. At present stations are located in Boston, New York, Long Island City, Passaic, Chicago, Washington and on the West Coast.