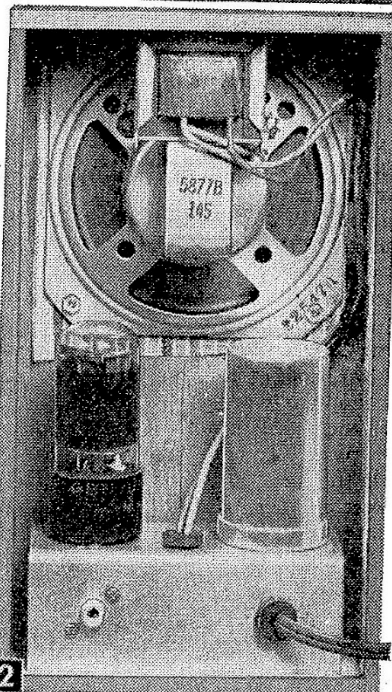
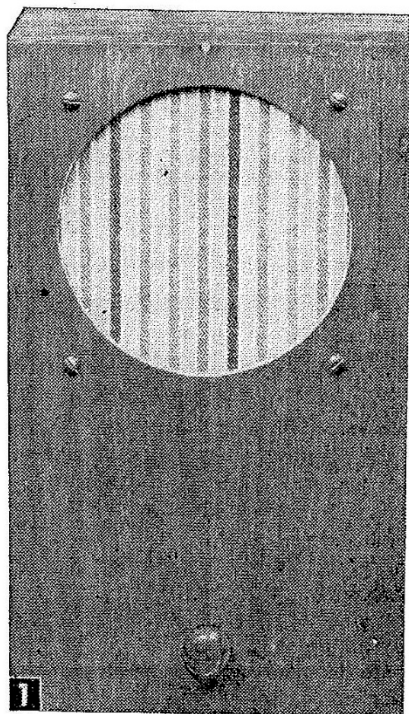


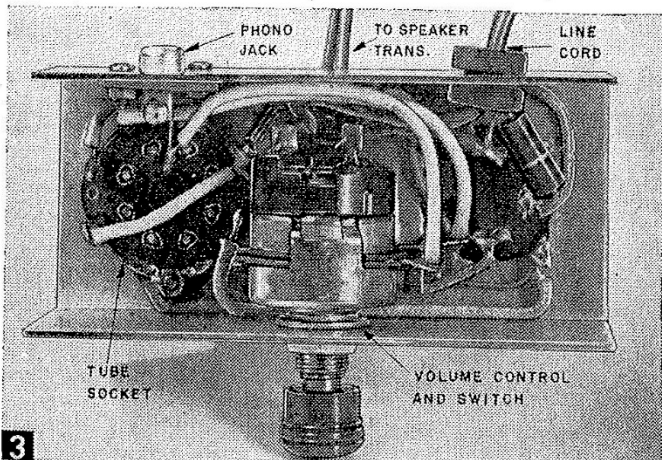
One-Tube Cigar-Box Amplifier

For low-cost convenience or as an extra amplifier for radio or record fans, try building this simply designed unit

BY THOMAS A. BLANCHARD
 Radio Editor



1 Above, utility amplifier built into converted cigar box makes a handy addition to the radio experimenter's work and test bench. Below, mounting 2500-ohm output transformer for PM speaker on speaker frame instead of chassis saves space and leaves amplifier section flexible for connecting to other remote speakers if desired.

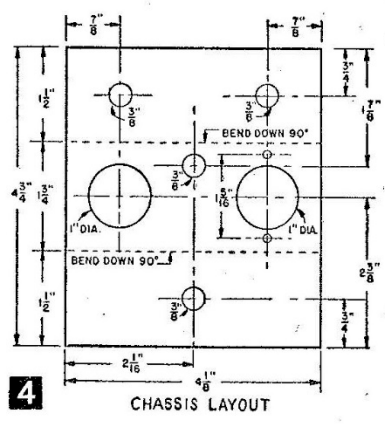


3 Underside of chassis shows the few parts and simple wiring that make this amplifier easy to build.

A SMALL portable amplifier that requires a minimum of parts and time to assemble will be a handy addition to your radio experimenting workbench. You can use this 1-tube circuit for the "innards" of a child's phonograph with a high-output pick-up (2 to 4 volts) or radio tuner.

The simplicity of the circuit is due to the single tube—a 117L7/M7GT that is actually two tubes in one. Half of the tube is a beam power amplifier similar to a 50L6GT. The other half of the tube acts as a half-wave rectifier similar to a 35Z4GT. The tube's two series heaters require no voltage-drop resistor or stepdown transformer, but operate directly off the standard household 110-125-volt *ac-dc* power line.

The metal chassis is simply a $4\frac{1}{8}$ x $4\frac{3}{4}$ -in. piece of 16-gage (.050 in.) aluminum. Lay out and cut the holes with a hole saw or fly-cutter and bend to shape. To keep the number of parts to a minimum, a triple-section electrolytic filter capacitor mounts in one of the large holes. The second hole is for the tube. The two 50-*mfd*, 150-volt sections of the capacitor are connected into the *dc* filter circuit, while the third section (20 *mfd*, 25 volts) bypasses the cathode resistor. All positive capacitor sections terminate at insulated soldering lugs. The capacitor can form a common negative for all three sections (shown as points A, B and C in the illustration, Fig. 5).



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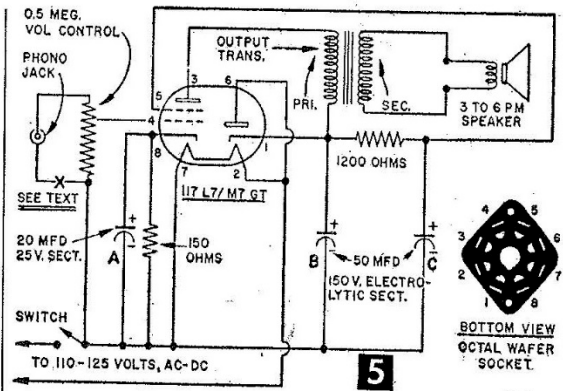
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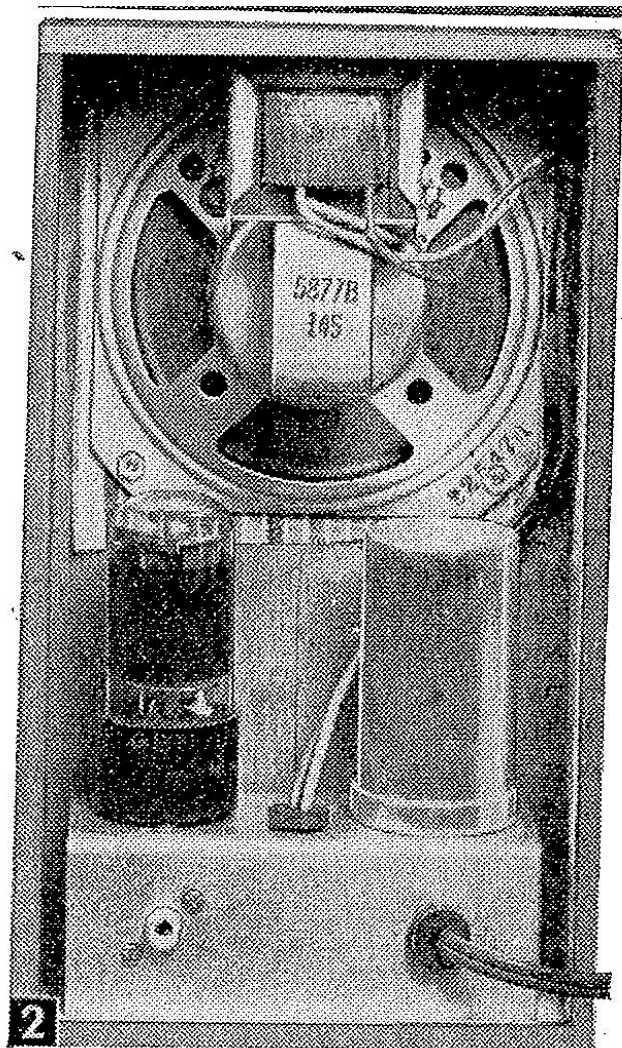
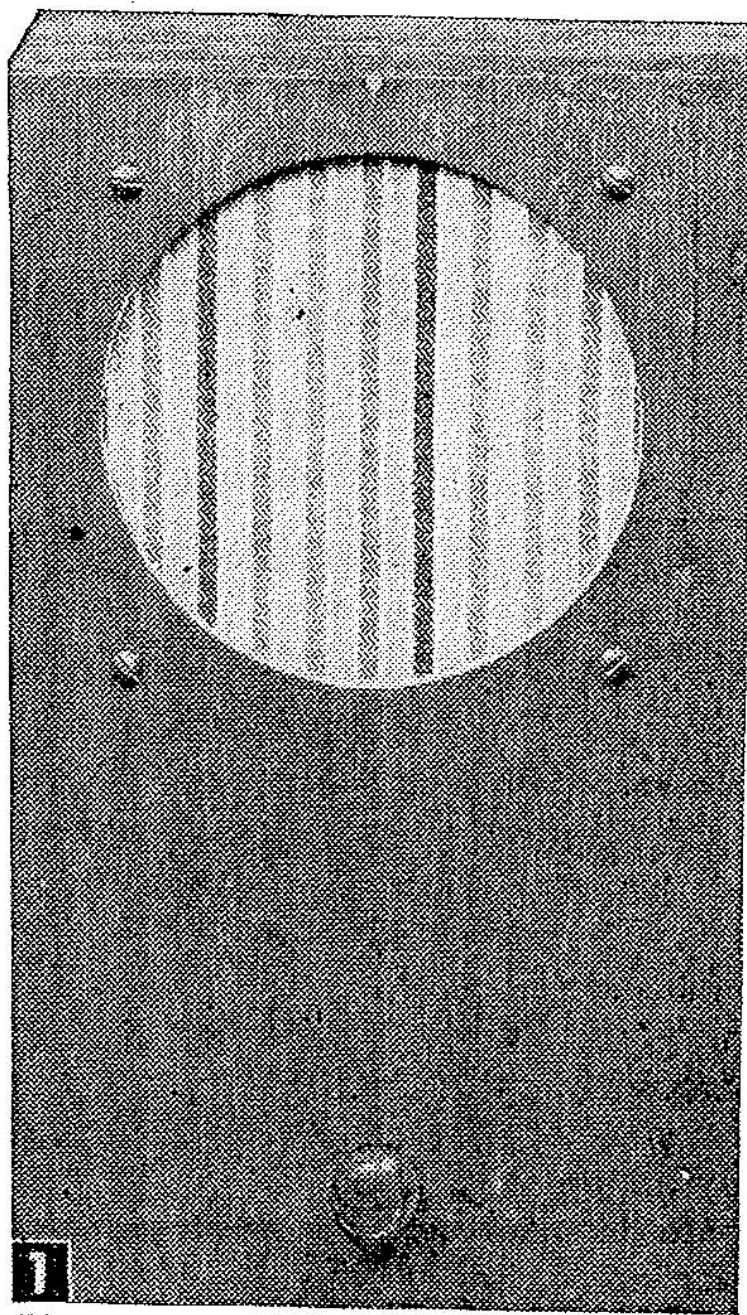
- MATERIALS LIST—1-TUBE AMPLIFIER**
- 1 pc. #16 gage aluminum (for chassis) 4 1/8 x 4 3/4"
 - 1 octal wafer socket; 1 1/16 mtg. centers
 - 1 C-D electrolytic capacitor, triple section (50-50 mfd., 150 v., 20 mfd., 25 v.) Type U.P., #5515C. Note: Constructor may substitute 20-20-20; 30-30-20, etc.
 - 1 0.5 megohm volume control with switch
 - 1 150 ohm, 1/2 watt resistor
 - 1 1200 ohm, 1 watt resistor
 - 1 phono jack (ICA, RCA)
 - 1 output transformer (2500 ohm pri., 3-5 ohm sec.)
 - 1 117L7/M7GT tube
 - 1 6-ft. line cord & plug
 - Miscellaneous hardware, hook-up wire, rubber grommets

To minimize wiring, the amplifier chassis forms the negative side of the circuit as a ground. While this arrangement leaves the chassis "hot", it is quite safe from shock when mounted in a wood or other non-metallic housing. Shock that might result from handling metal pick-up arm on a record player can be prevented by inserting a .05-mfd 200-volt paper capacitor at (X) in Fig. 5 and mounting the phono jack on a Bakelite disc. However, most modern pick-up arms are plastic. The only chance for a shock from touching chassis is when you're standing on a damp concrete floor or touching some grounded object.

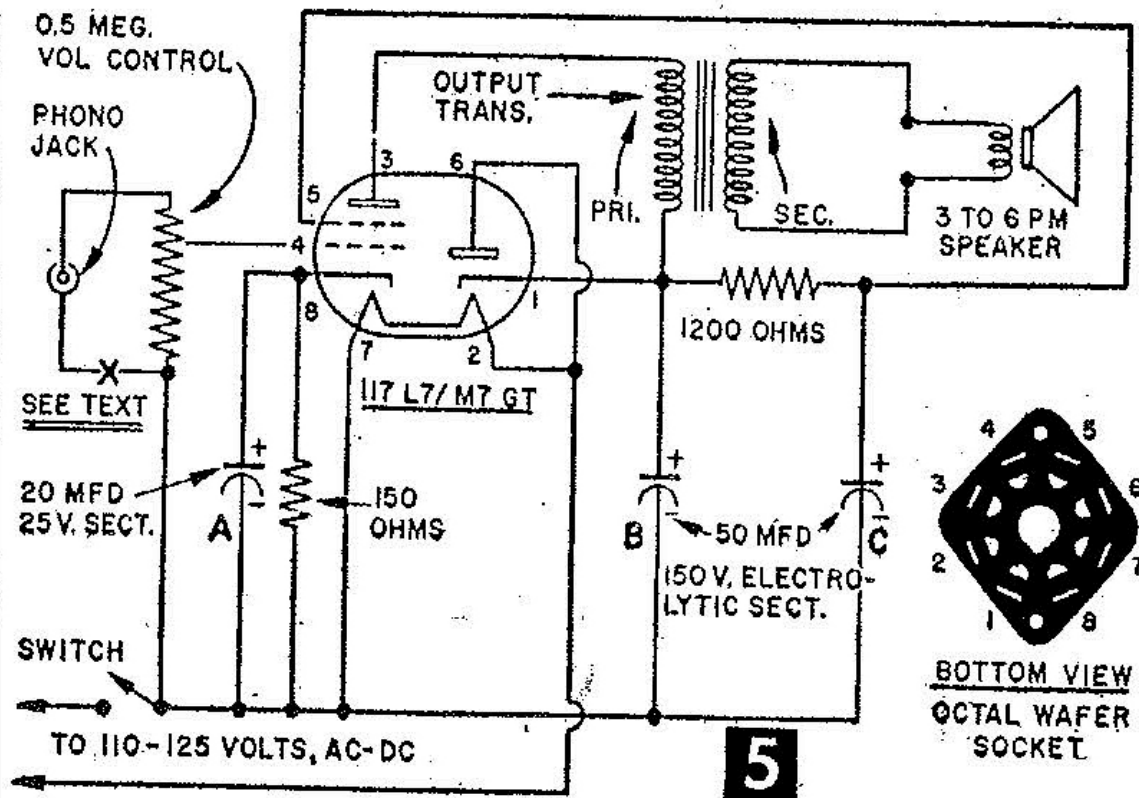
The completed amplifier was so small there was no commercial stock cabinet that would fit. I made the cabinet shown in Fig. 1 from a cigar box. Remove all the printing or decorative paper with a sanding disc mounted in a portable electric drill. Cut out the 3 3/8-in. hole for speaker with a fly-cutter, coping or keyhole saw. After a fine sanding, apply two coats of white shellac, sanding after each coat is dry with 6/0 garnet paper. Apply paste wax and polish. Cement a disc of cloth to the back side of the speaker hole.

The cigar box cabinet takes a 4-in. PM speaker, but any size up to 12 in. may be used in a suitable baffled box with greater volume and improved tone quality. Since the amplifier is a complete unit, the speaker may be mounted separately from the amplifier. The output transformer for the speaker may be mounted directly on the speaker (brackets are usually provided).

You can mount the amplifier in the cigar box cabinet with the threaded 3/8-in. bushing of the 0.5 megohm volume control. Bring out the two flexible leads from socket lugs #3 and #1 for connecting to primary of speaker transformer. Use rubber grommets on these two flexible leads and the power line into the back of chassis.—END



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- Miscellaneous hardware, hook-up wire, rubber grommets



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