



Type LC-1A
Duo-Cone Loudspeaker

RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION CAMDEN, N. J.

1B-24475

INSTRUCTIONS

Type LC-1A
Duo-Cone Loudspeaker
(MI-11411)

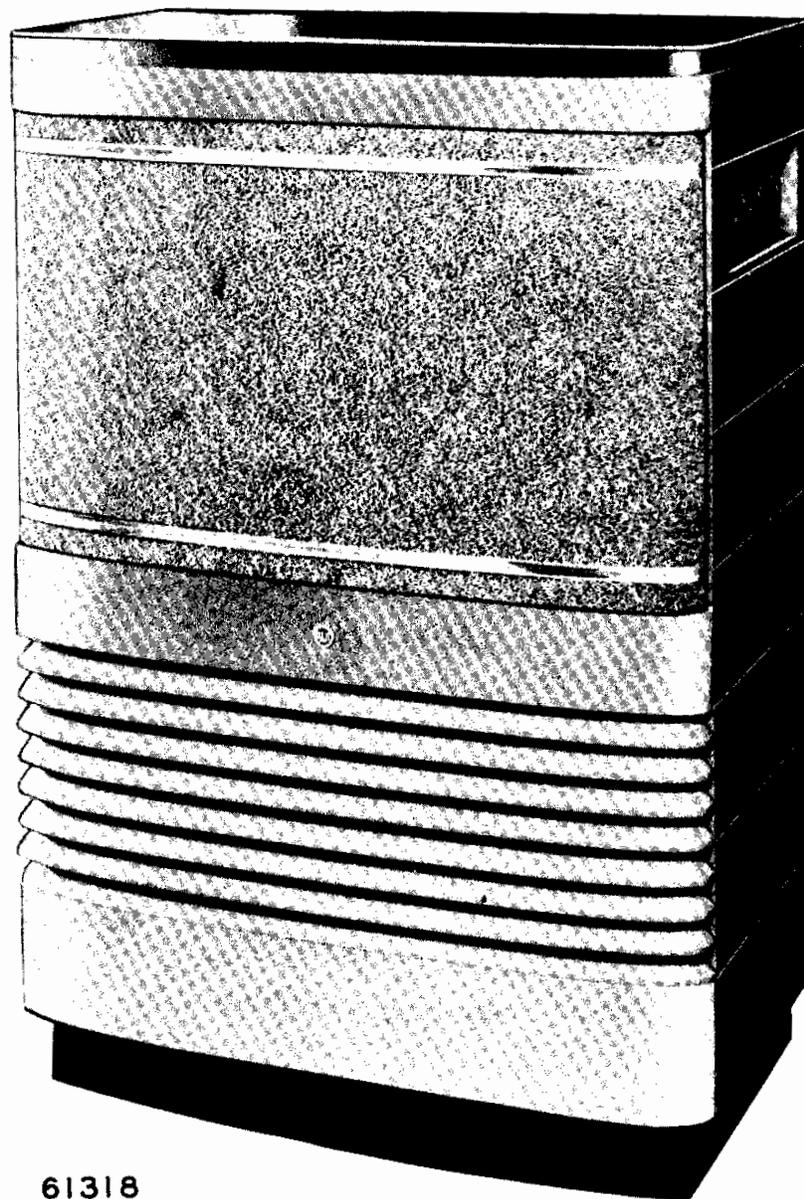
Cabinets (MI-11401 and MI-11401-A)

Cut-Off Filter (MI-11707)

Accessory Kit (MI-11711)

Power Attenuator (MI-11708-A)

RADIO CORPORATION OF AMERICA
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Figure 1—MI-11401 Speaker Cabinet

DESCRIPTION

LC-1A Loudspeaker

The Type LC-1A Duo-Cone Loudspeaker (MI-11411) is a wide-frequency range, wide-angle, low distortion loudspeaker suitable for use in systems requiring high-fidelity sound reproduction. The duo-cone unit consists of two coaxial direct-radiator cones individually driven. The large outer cone reproduces the low frequency sounds and the small inner cone reproduces the high frequency sounds. The cross-over network utilizes a 4-mf capacitor to limit the low-frequency current flowing in the high-frequency unit.

Cabinets

The MI-11401 and MI-11401-A Cabinets have been designed to enhance the wide-angle radiation characteristics and frequency response of the duo-cone loudspeaker. Each cabinet contains an MI-11707 Speaker Cut-Off Filter (see below). The cabinets have facilities for mounting, in addition, any of the Type BA-4 Series of Monitoring Amplifiers (MI-11223 Series).

MI-11707 Speaker Cut-Off Filter

The MI-11707 filter is designed to cut off the signal to the high-frequency unit at either 5 kc or 10 kc (fig. 3). A cut-off selector switch is supplied with the filter. The 15-kc switch position removes the filter from the circuit.

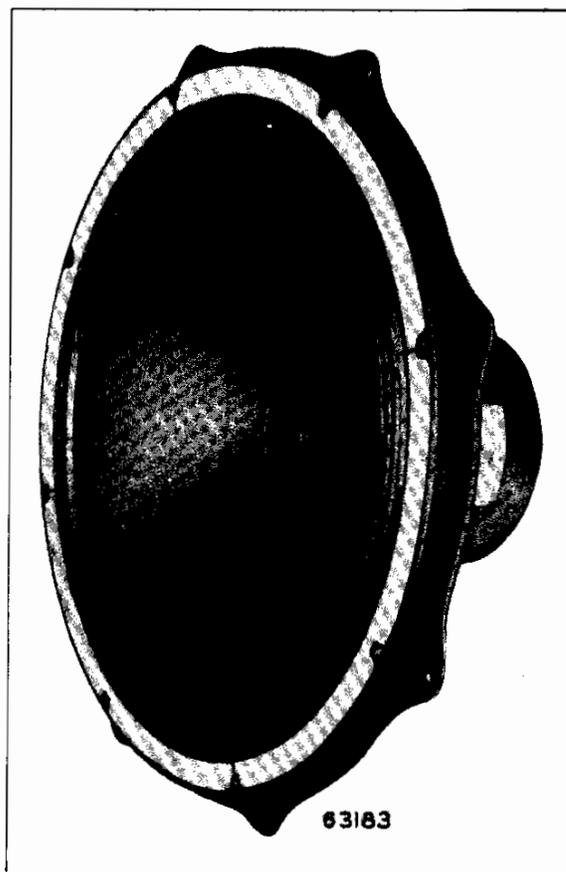


Figure 2—Type LC-1A Speaker, front view

TECHNICAL DATA

LC-1A Speaker (MI-11411)

Impedance—15 ohms
 Power handling capacity—20 watts
 Frequency response—See fig. 4
 Directional characteristics—See fig. 5
 Distortion—See fig. 6
 Sensitivity—92.5 db (measured with 1 mw signal at 4 ft.)
 Dimensions—See fig. 8
 Weight—21 pounds

Associated Equipment

Cabinets for LC-1A Speaker: MI-11401 and MI-11401-A
 Speaker Cut-Off Filter: MI-11707 (included in MI-11401 and MI-11401-A)
 Speaker Accessory Kit: MI-11711
 Speaker Power Attenuator: MI-11708-A
 Type BA-4 Series of Monitoring Amplifiers: MI-11223 Series (includes MI-11274-A Remote Volume Control)

BA-4 Series of Monitoring Amplifiers

See IB-24410 Series of Instruction Books (furnished with amplifier)

MI-11401 Cabinet and MI-11401-A Cabinet

Dimensions—See fig. 7
 Weight—50 lbs.
 Finish
 (a) MI-11401—Umber grey
 (b) MI-11401-A—Walnut

MI-11707 Filter

Source Impedance: 15 ohms unbalanced
 Load Impedance: 15 ohms unbalanced
 Insertion loss: Negligible
 Frequency response: See fig. 3
 Cut-Off Frequencies: 5 kc and 10 kc
 15 kc switch position removes filter from circuit
 Dimensions: 5 x 4 x 2 inches. See fig. 11

MI-11708-A Speaker Power Attenuator

Source Impedance: 15 ohms
 Load Impedance: 15 ohms
 Insertion loss: Zero for 15-ohm source and load impedances, at maximum clockwise position
 Taper: Linear, 2 db per step
 Power-handling ability: 6 watts

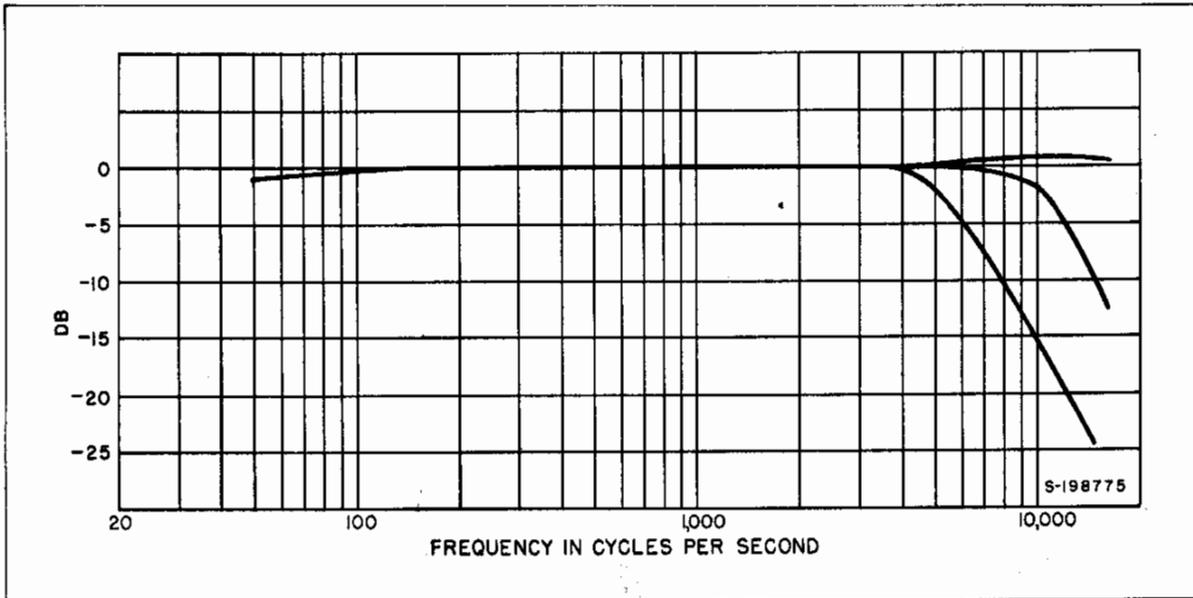


Figure 3—Frequency response of MI-11707 Filter

MI-11711 Speaker Accessory Kit

The MI-11711 kit includes a 10-position channel selector switch with a terminal board and marker plate. Sufficient hardware and cables are included in this kit to install any of the Type BA-4 Series of Monitoring Amplifiers (MI-11223 Series), together with the MI-11274-A Remote Volume Control, in the MI-11401, -A Cabinet. A power switch

with a neon pilot lamp is also provided with this kit.

MI-11708-A Speaker Power Attenuator

When the amplifier is not used in or near the cabinet and a speaker volume control is desired, the MI-11708-A may be installed. This attenuator is designed to operate from a 15-ohm source and feed directly into the LC-1A.

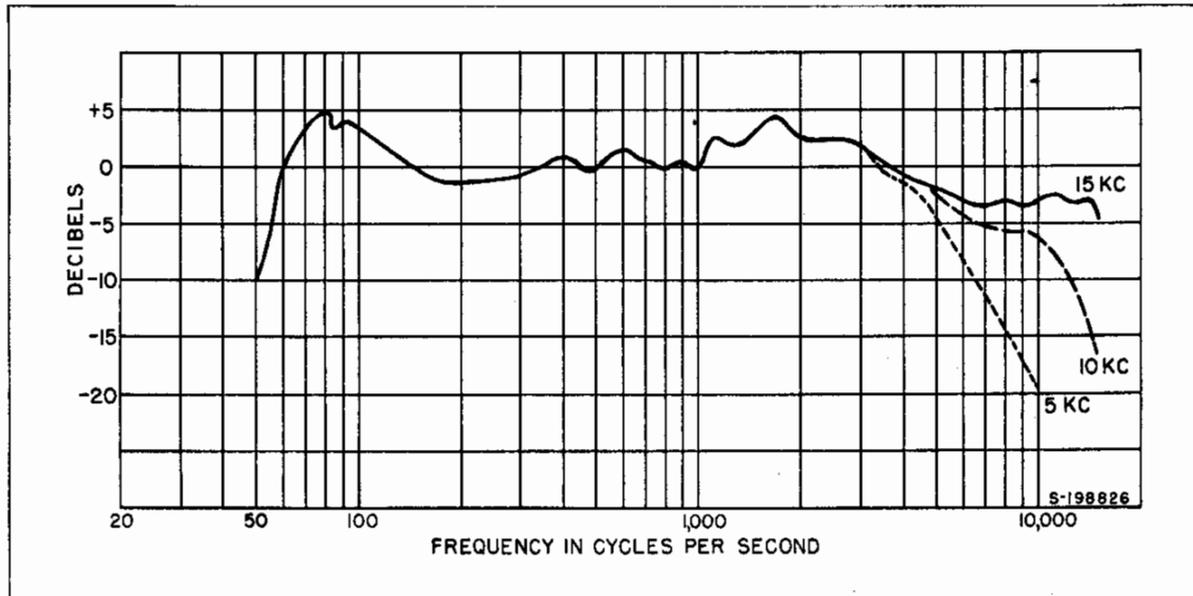


Figure 4—Frequency response of LC-1A Speaker in MI-11401, -A Cabinet and connected to MI-11707 Filter

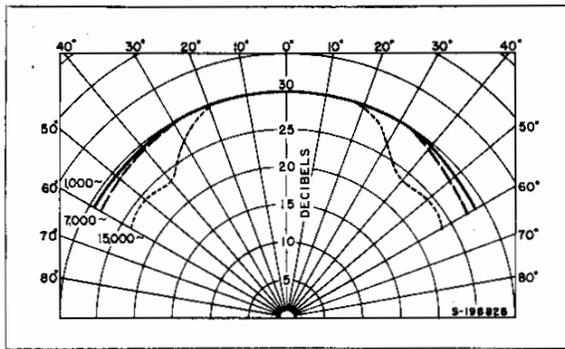


Figure 5—Directional characteristics of LC-1A Speaker mounted in MI-11401, -A Cabinet

INSTALLATION

Cabinet

Remove the upper section of the rear cover from the cabinet by removing the twelve wood screws which hold it in place. To open the hinged bottom section, remove the three machine screws.

Mounting LC-1A in MI-11401, -A Cabinet

Refer to figure 8 for the speaker dimensions. Mount the speaker in the cabinet with the eight No. 10 x $\frac{3}{4}$ -inch long wood screws. Holes are provided inside the front of the MI-11401, -A Cabinet (upper section) for this installation. When mounting the speaker in this cabinet, place the speaker so that the input terminal board marked 15 OHMS is closest to the base.

Other Mounting Methods

To obtain the best high-frequency response when mounting the speaker on a wall, ceiling or cabinet other than the MI-11401 or MI-11401-A, use open-weave material such as bouclé for the grille cloth. No part of the grille structure should be in front of the cones.

Remove any part of the baffle or wall which projects in the area enclosed by the extension of the sides of the cone, so that the sound waves will have an unobstructed path of travel. Use the outer holes to mount the speaker on the baffle as shown in figure 8, and mount the baffle so that it will be flush with the grille side of the wall.

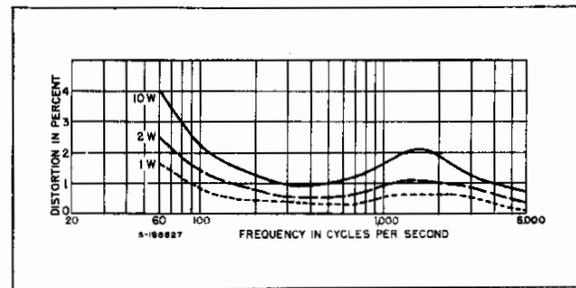


Figure 6—Harmonic distortion of LC-1A Speaker

Mounting BA-4A or BA-4C Amplifier

Sufficient hardware is provided with the amplifier and the MI-11711 kit to install the amplifier in the cabinet. Assemble the two L-shaped brackets to

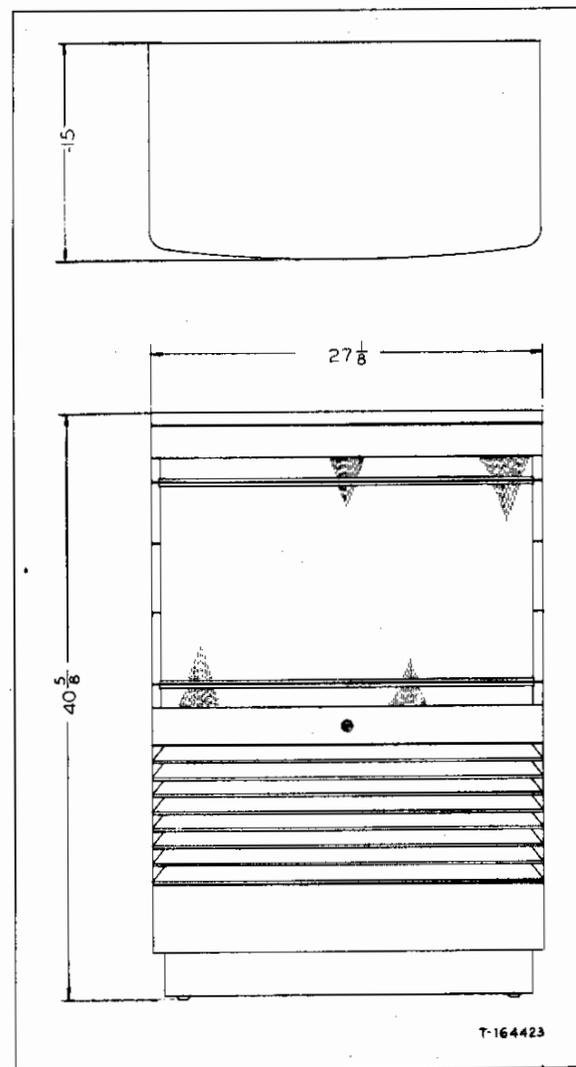


Figure 7—Dimensions of MI-11401, -A Cabinet

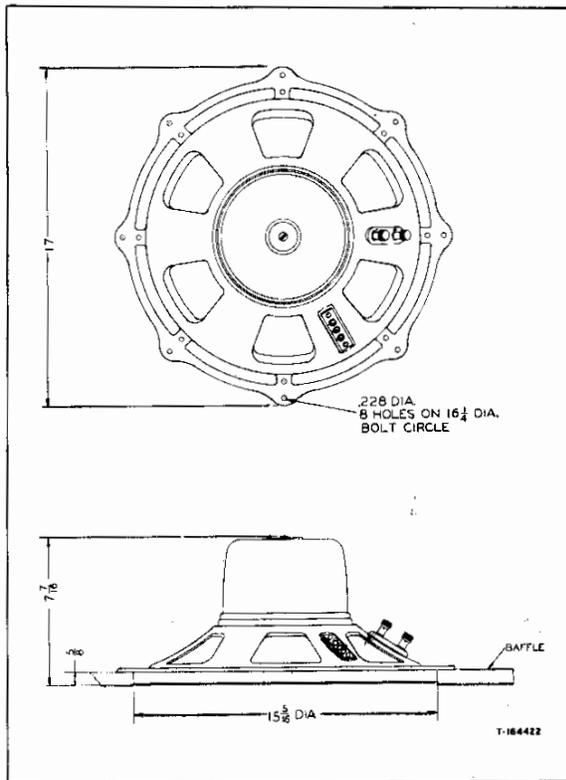


Figure 8—Dimensions of LC-1A Speaker

the rear panel of the amplifier chassis with four No. 8-32 round-head machine screws, lockwashers and hex nuts. Fasten the cover plate to the bottom of the chassis with four No. 8-32 round-head machine screws and lockwashers. Attach the amplifier (K, fig. 10) to the bottom of the cabinet with the four No. 8-32 binder-head machine screws and lockwashers. "Tee" nuts are mounted in the floor of the cabinet to receive these screws.

Mounting MI-11274-A Remote Volume Control

Remove the plug button (B, fig. 10). Install the volume control, with the hardware on the control shaft, in the opening provided by the removal of this plug button. Place the knob on the control shaft.

Mounting MI-11711 Speaker Accessory Kit

Refer to figure 10. Remove the plug buttons (F and H). Place the shield against the inside of the control panel so that the holes in the shield (G) line up with the switch and pilot lamp openings. This shield will be held in place by the switch-and pilot-lamp mounting hardware. Fasten the switch to the plate (E, hole H) with the two 15/32-32 hex nuts and washer. The washer should be placed

on the switch shaft under the hex nut which is to be outside of the cabinet.

Be sure the switch is in the position shown in figure 13. Mount the neon pilot lamp and socket on the cabinet (hole F) with the nut and lockwasher supplied on the socket.

Remove the plug button (D). Mount the input-selector switch in this opening with the 3/8-32 hex nut, washer and lockwasher. The lockwasher should be on the shaft inside of the cabinet and the hex nut and plain washer on the outside. Place the knob on the shaft.

With the terminal board holes lined up with the holes in the marker strip, mount this assembly (J) to the side of the cabinet with four No. 6 x 5/8-inch long wood screws.

Mounting MI-11708-A Attenuator

Remove the plug button (B, fig. 10). Place the attenuator shaft in the hole and fasten with the nut and plain washer. Place the knob supplied with the attenuator on the shaft.

Mounting MI-11707 Speaker Cut-Off Filter

When the filter is supplied separately, it may be mounted in a cabinet with four wood screws. Refer to figure 11 for the mounting dimensions of the

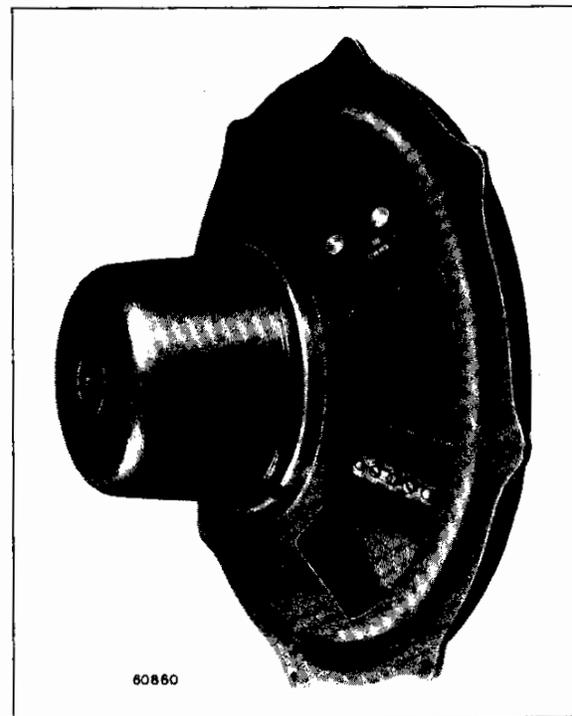


Figure 9—Rear view of LC-1A Speaker

filter base. Mount the filter switch with the hardware supplied on the switch shaft.

CONNECTIONS

Connections to BA-4A, C Amplifier

Connect the leads from the MI-11711 cable to the amplifier and its remote volume control as shown in figure 13. Attach the leads having the terminals to the screw-type terminals on the male plug (L, fig. 10) which is mounted in the lower-right hand corner of the back of the cabinet (rear view). Connect the input leads, through the hole in the left-hand side of the back of the cabinet, to the input-selector terminal board. Up to ten pair of input leads may be connected. Use terminals number 1 and 2 for channel 1, terminals 3 and 4 for channel 2, etc. The INPUT switch (C, fig. 10) selects the

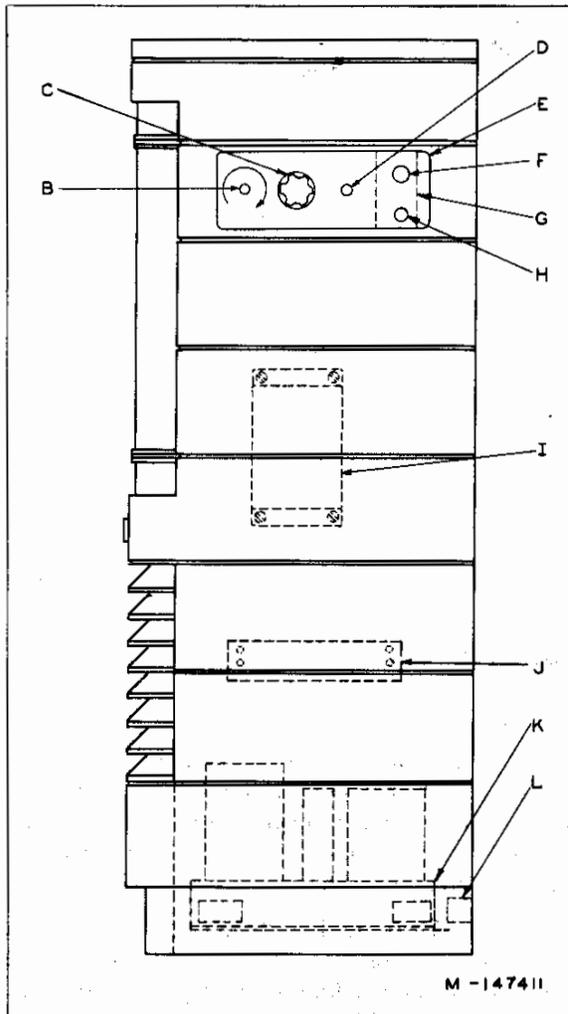


Figure 10—Side view of MI-11401, -A Cabinet

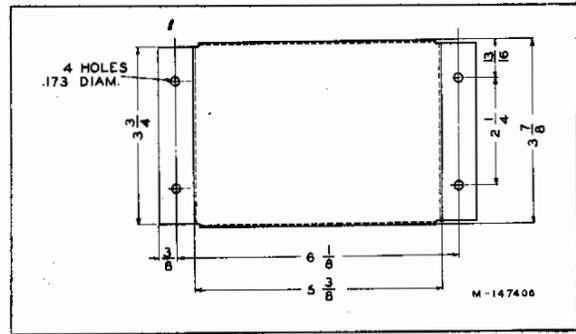


Figure 11—Mounting dimensions of MI-11707 Filter

desired channel. Connect the remaining pair of blue and yellow leads to the + and - terminals of the speaker. Use the six wood screws to fasten the six cable clamps to the cabinet.

Connections to MI-11707 Filter

Remove the link from between terminals 1 and 2 on the speaker terminal board. Attach the output leads from the filter (I, fig. 10) to this terminal board as follows:

- Red (output) lead to terminal number 1,
- Yellow (common) lead to terminal number 2,
- Green (input) lead to terminal number 3.

Connections to MI-11708-A Attenuator

When using the MI-11708-A, attach the input leads to the IN and C terminals of the attenuator, and connect the OUT and C terminals to the + and - speaker terminals.

NOTE: When connecting several LC-1A speakers in the same vicinity, be sure that all the leads from the same side of the input line are connected to the same terminal (+ or -) on each speaker.

A-C Power Connections

Connect a standard parallel-slot receptacle to a power supply of the proper voltage and frequency for the amplifier. Attach this receptacle to the plug on the cabinet. The switch furnished with the

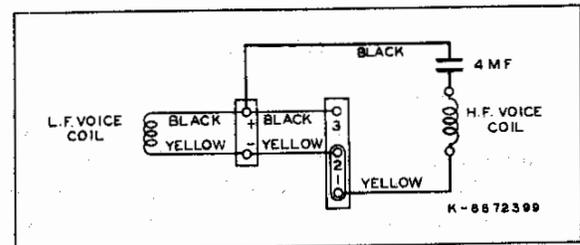


Figure 12—Schematic diagram of LC-1A Speaker

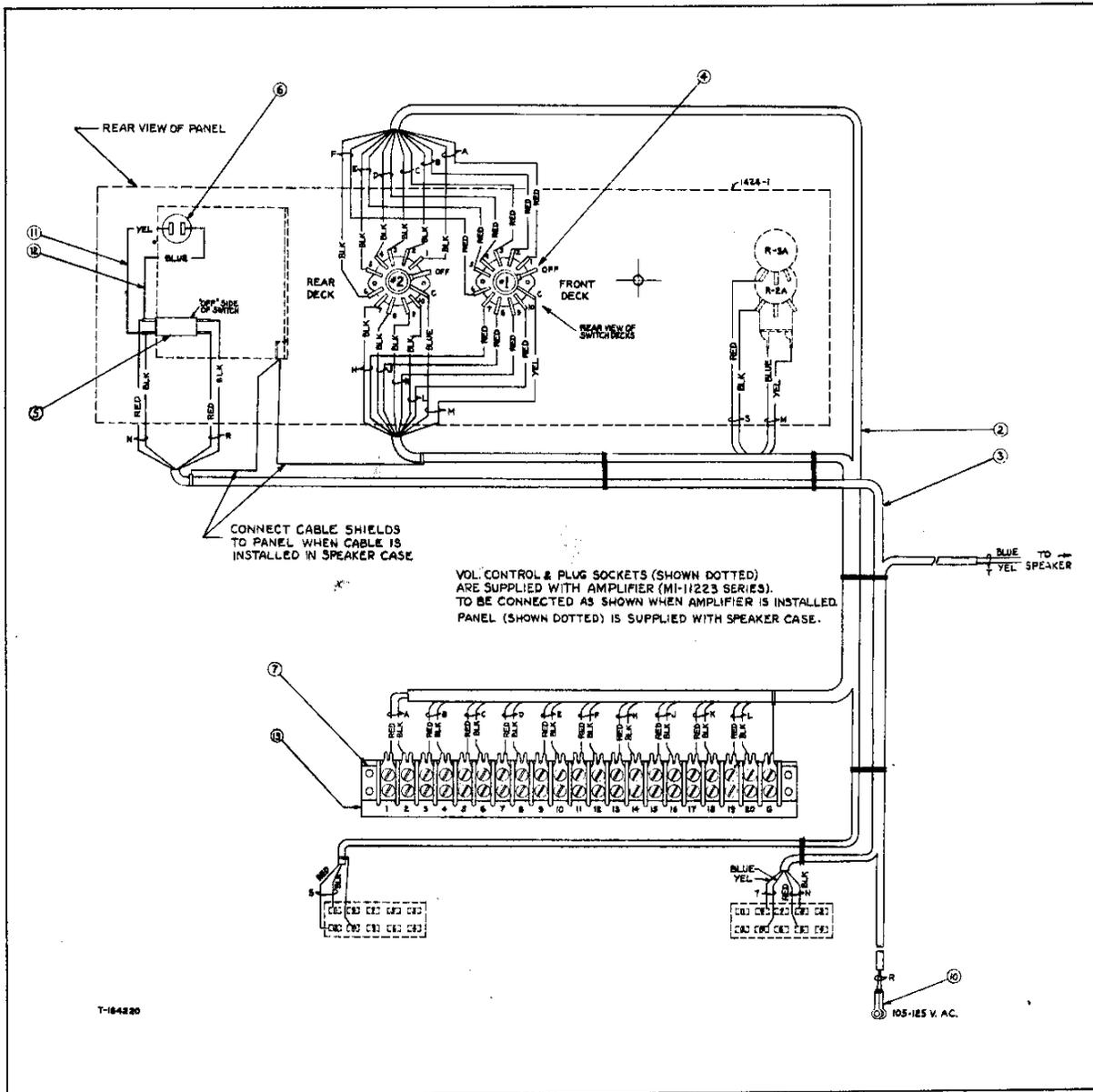


Figure 13—Wiring diagram, MI-11711 Accessory Kit

MI-11707 serves as an ON-OFF switch for this amplifier, and the neon bulb is a power indicator.

SERVICE

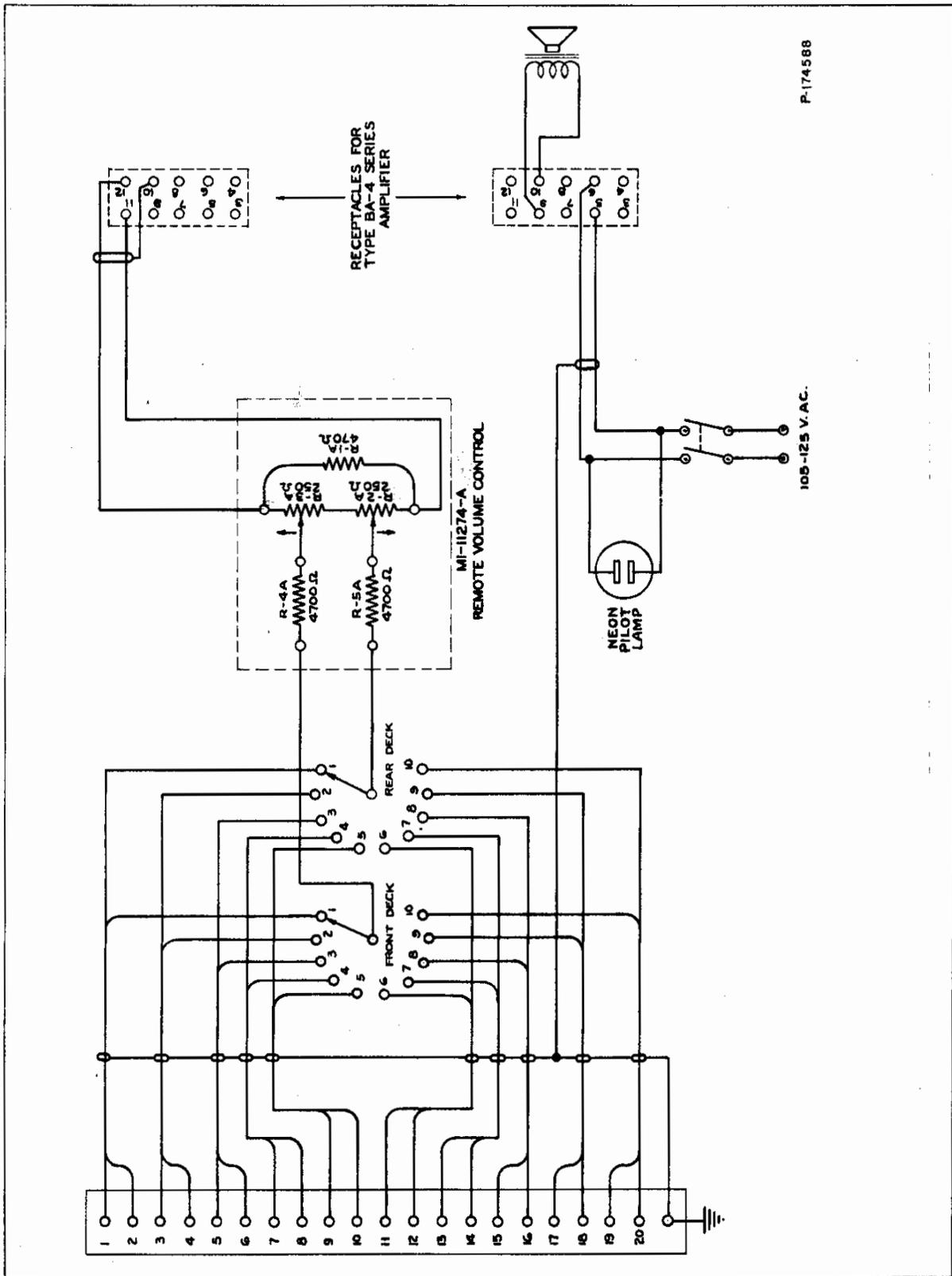
Centering of Speaker Cones

If it becomes necessary at any time to re-center the high-frequency cone, first loosen the two screws (A, fig. 15) and the screw which is placed in the center of this cone assembly. To re-center the low-frequency cone, first loosen the two screws (B, fig. 15).

Phasing

If at any time it becomes necessary to connect voice coils of new speaker cones, be sure they are connected as described in the following paragraphs so that the two cones will continue to vibrate in phase. Refer to figure 15.

Connections to the high-frequency voice coil are made by means of the two screws (A) which also serve to mount the high-frequency cone assembly. When replacing this assembly, be sure the threaded hole in the cone-mounting ring which is colored



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Figure 14—Schematic diagram, MI-11711 connected to a BA-4 Series Amplifier

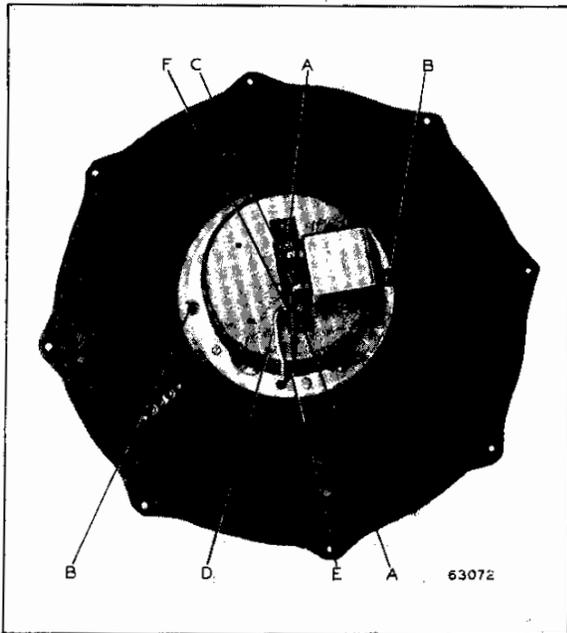


Figure 15—LC-1A Speaker, rear cover removed

yellow is lined up with the similarly colored hole in the core cap.

The wiring to the low-frequency voice coil leads (D-yellow, E-black) is clearly shown in the illustration. Be sure the black lead is soldered to the capacitor terminal (C) and the yellow lead soldered to the terminal (F) on the terminal board.

Replacement Parts

The following parts list is included to provide identification when ordering replacement parts. Order from *RCA Replacement Parts Department, Camden, New Jersey*, giving the *description* and *stock number* of the parts wanted. Replacement parts supplied may be slightly different in form or size from the original parts but will be completely interchangeable with them.

LIST OF PARTS

Description	Stock No.
MI-11411 Duo-Cone Loudspeaker	
Capacitor, fixed paper, wax impregnated, 4 mf, 100 v, drawn shell container, side mtg, rivet lug term, water immersion tested	47974
Cone, low frequency cone assembly; comprising cone and voice coil assembly, and gaskets	72198
Cone, high frequency cone and voice coil assembly	72199
MI-11707 Cut-Off Filter (part of MI-11401 and MI-11401-A Cabinets)	
Capacitor, fixed paper, 1 mf, 100 v	70618
Reactor, air core, 4 coils, #1-0.25 mh, #2-0.5 mh, #3-0.25 mh, #4-0.5 mh at 1000 cycles with 0 amp dc	54886
Switch, rotary, 1 section, 3 positions, non-shorting	54888

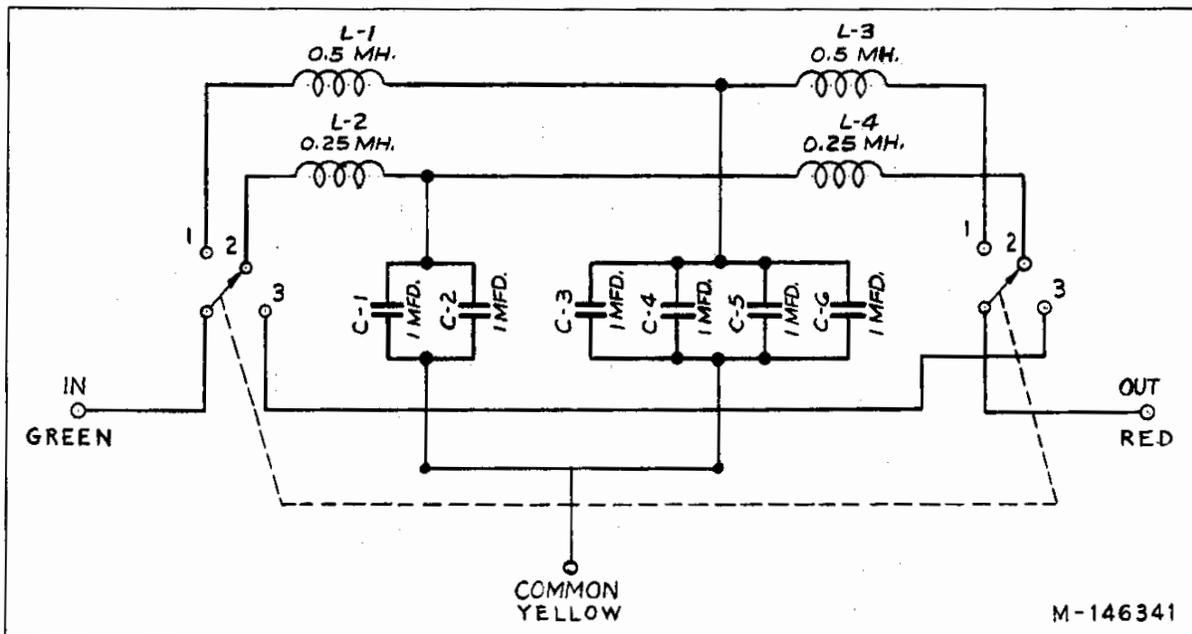


Figure 16—Schematic diagram, MI-11707 Filter

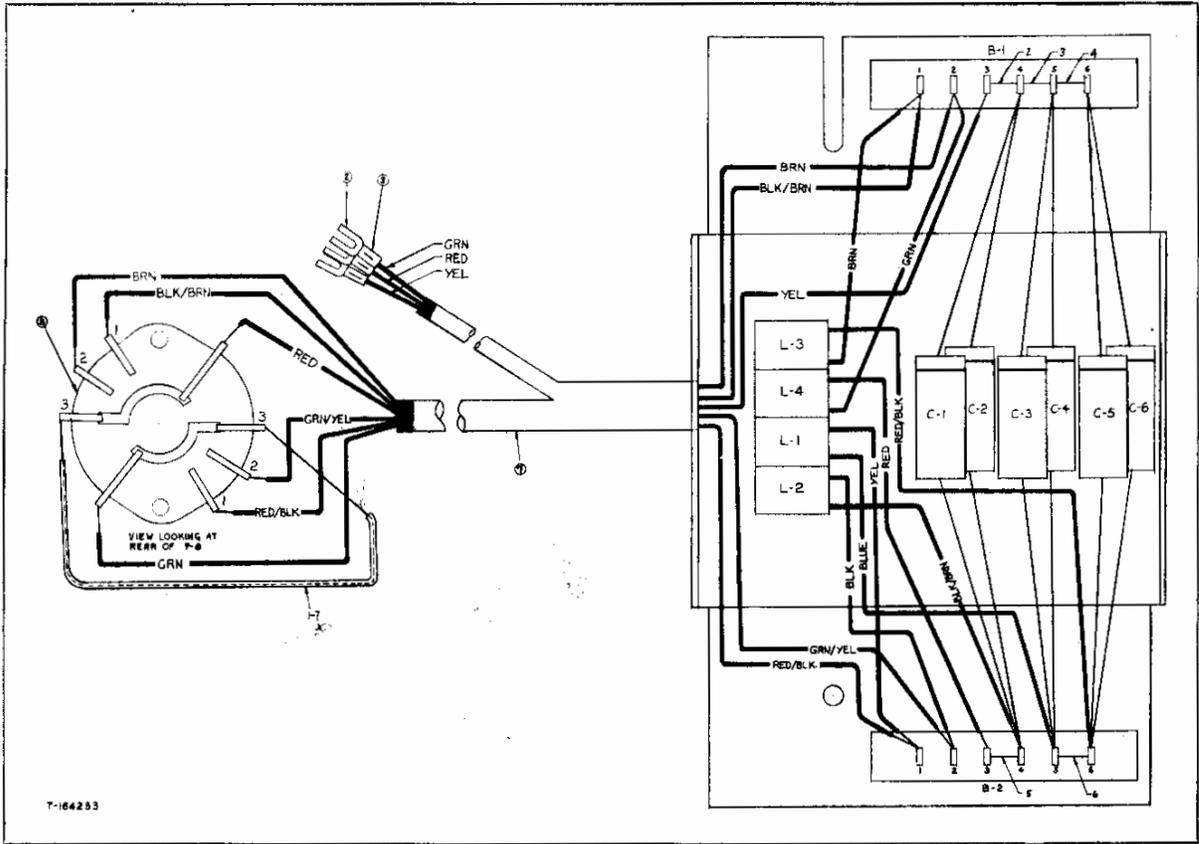


Figure 17—Wiring diagram, MI-11707 Filter

LIST OF PARTS (cont'd)

Description	Stock No.
MI-11401 and MI-11401-A Cabinets (see also MI-11707, above)	
Connector, male, 2 contacts, chassis mtg	54887
Knob, round, fluted, with pointer and groove, 1½" diam, black, with 2 set screws	17268

MI-11711 Accessory Kit

Description	Stock No.
Lamp, indicator, neon, 110 v, red, overall lg 2-1/16", white nickel finish	54894
Switch, rotary 5 sections, 11 positions, bushing ¼" lg, threaded 3/8-32, shaft ¼" diam x ½" lg, Oak Mfg. Co., Type H	54893
Switch, toggle, DPST, bushing 15/32" lg threaded 15/32-32, 1-9/16" lg including terminals, 21/32" wide, 15/32" high, Arrow-Hart and Hegeman	43281

