FEATURES

Your new Realistic MPA-45 PA Amplifier gives you 35 watts of solid power for your PA System. Its wide frequency response makes it suitable for music and voice. Use it in meeting halls and auditoriums, at sports events, in schools, in the office for paging systems — anywhere you need special announcements or great sound.

Read this manual carefully. It describes various speaker connections to help you select the best arrangement for your system.

Your amplifier also includes the following features:

**Two Microphone Input Jacks** — let you connect two microphones.

**PHONO and AUX Input** — let you connect a phonograph and a tape recorder or receiver for music and special effects.

**Priority Terminals** — let the Microphone 1 output override all other inputs.

**MASTER VOLUME Control** — lets you adjust the overall sound level.

**Frequency Equalizer** — lets you control the sound level of three separate frequency ranges.

### 70-Volt Line Output

— lets you connect line transformers for a multiple-speaker PA system.

For your permanant records, we suggest you record the amplifier’s serial number in the space below. The serial number is on the amplifier’s back panel.

**Serial Number**

**WARNING:** To reduce the risk of fire or electric shock, do not expose this appliance to rain or moisture.

**CAUTION:** TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK), NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of uninsulated dangerous voltage within the product’s enclosure.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

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CONNECTIONS

CONNECTING MICROPHONES
Use the MIC 1 and MIC 2 jacks to connect one or two microphones to the amplifier. The microphone(s) can be high- or low-impedance and must have a 1/4-inch plug.

CONNECTING A TURNTABLE
Connect a turntable to the amplifier’s L and R PHONO jacks.
Connect your turntable’s ground wire (usually black or green) to the amplifier’s GND screw to void hum.

CONNECTING AN AUXILIARY SOUND SOURCE
Connect an auxiliary sound source, such as a tape deck or a tuner, to the amplifier’s L and R AUX jacks.

CONNECTING POWER
You can power your amplifier from standard household AC power. To connect the amplifier to power, plug the supplied AC cord into any standard outlet.
Your amplifier’s fuse (located on the amplifier’s back panel) protects your amplifier from voltage surges. If the power indicator does not light when you press POWER, check the fuse. If the fuse is blown, replace it with the supplied spare fuse or an identical 2-amp, 250-volt fuse. Be sure you unplug the power cord before you replace the fuse.
To replace the amplifier’s fuse, use a Phillips screwdriver to unscrew the fuse holder. Then, remove the fuse holder, replace the fuse, and replace the fuse holder.
For the best results, use speakers that are rated at 4 to 16 ohms. For speaker connections, use 18-gauge speaker wire for lengths up to 25 feet. Use 16-gauge wire for lengths over 25 feet. We recommend that you use the shortest length of wire possible.

To prepare the speaker wire, remove about 1 inch of insulation from the end of the speaker wire you intend to connect to the amplifier. Then, twist the exposed wire to secure all of the wire strands.

To connect speaker wire to the amplifier, press down the appropriate push terminal lever on the amplifier and insert the end of the wire into the terminal’s hole. Then, release the lever to secure the wire.

You can connect two or more speakers with or without transformers.

**DETERMINING SPEAKER POLARITY**

Most speaker terminals are color-coded or have a mark that indicates the terminal’s polarity. Usually, terminals with positive polarity are red or have a plus symbol (+), and terminals with negative polarity are black or have a minus symbol (−). If your speakers’ terminals do not indicate their polarity, you must determine the polarity yourself to ensure that the speakers are properly phased.

Proper phasing is important when you use more than one speaker in the same room or area. Speakers are in-phase when their cones move in the same direction when an equal signal is applied to the speakers. Connecting speakers out of phase can reduce the speakers’ overall response.

Follow these steps to determine the polarity of the speaker terminals.

1. Connect one end of a 1.5-volt flashlight battery to one of the speaker terminals.
2. Briefly touch the opposite end of the battery with the other speaker terminal. The speaker cone moves in or out.

If the cone moves in, the terminal connected to the battery's negative side is positive.

CONNECTING ONE SPEAKER

Connect the speaker's negative (−) terminal to the amplifier's COM terminal. Then, connect the speaker's positive (+) terminal to the terminal that matches the impedance of the speaker. The following example shows an 8Ω speaker connected to the amplifier's 8Ω terminal.

Mark the positive terminal with a plus (+) sign.

3. Repeat Steps 1 and 2 for each speaker.

Note: We recommend 18-gauge speaker wire if the length of wire is 25 feet or shorter. If the length of wire is longer than 25 feet, use 16-gauge wire. For the best results, we suggest you use the shortest length of speaker wire possible.
CONNECTING SPEAKERS WITHOUT TRANSFORMERS

If you connect speakers without transformers, the lengths of speaker wire should be no longer than 50 feet. For lengths up to 25 feet, use 18-gauge wire; for lengths from 25 to 50 feet, use 16-gauge wire. To ensure equal volume from each speaker, all the connected speakers should have the same impedance rating. The following examples show 8Ω speakers, which are the most common type sold by your local Radio Shack store.

Connecting Speakers in Series

Before you connect speakers in series, determine the total impedance for the speakers. To do so, add the impedance of all connected speakers. For example, if you connect two 8-ohm speakers, add 8 (impedance of one speaker) plus 8 (impedance of the other speaker) for a total impedance of 16 ohms. The total impedance should match one of the amplifier's terminals (4Ω, 8Ω, or 16Ω).

Caution: The total impedance must be at least 4 ohms but must not exceed 16 ohms.

Connecting Speakers in Parallel

Before you connect speakers in parallel, determine the total impedance. To do so, divide the impedance of one speaker by the number of speakers. For example, if you connect two 8-ohm speakers, divide 8 (impedance of speakers) for a total impedance of 4 ohms. The total impedance should match one of the amplifier's terminals (4Ω, 8Ω, or 16Ω).

Caution: The total impedance must be at least 4 ohms but must not exceed 16 ohms.

Combining Series and Parallel Connections

If you connect more than two speakers using only series or only parallel connections, the total impedance might exceed the amplifier's maximum impedance (16 ohms) or fall below its minimum impedance (4 ohms).

For example, if you connect four 8-ohm speakers in series, the total impedance is 32 ohms (8+8+8+8=32). Or, if you connect four 8-ohm speakers in parallel, the total impedance is 2 ohms (8 divided by 4=2).

Caution: A total impedance that is too high or too low can damage your amplifier or speakers.
You can arrive at a proper total impedance by combining series and parallel connections. In the following example, we show the connection of four 8-ohm speakers.

First, connect each pair of speakers in series. Each pair has a total impedance of 16 ohms (8+8=16).

Next, divide 16 (the impedance of one pair of speakers) by 2 (the number of pairs) for a total impedance of 8 ohms. After you determine the total impedance, connect the two pairs of speakers in parallel.

CONNECTING SPEAKERS WITH TRANSFORMERS

If you connect two or more speakers in your system, you can use a line transformer (Cat. No. 32-1031) for each speaker.

Transformers offer these advantages:

- You can use speakers that have different impedances without causing differences in output between the speakers.
- You can add or remove a speaker from the system without having to recalculate the impedance for the entire system.

- You can reduce signal loss when you use runs of speaker wire over 50 feet long.

Note: Use 18-gauge speaker wire for lengths up to 25 feet, and use 16-gauge wire for lengths more than 25 feet.

Line transformers have several connectors called taps. The primary taps are on one side of the transformer, and are marked as 10, 5, 2.5, 1.25, and 0.62 watts. The secondary taps are on the other side of the transformer, and are marked as 4, 8, and 16 ohms.
Connecting the Primary Taps

Before you connect speakers, be sure the total wattage of the primary taps you intend to use does not exceed the amplifier’s power rating of 35 watts. In the following example, the total wattage is 8.75 watts.

Note: Use the connections shown below to avoid multiple connections to the amplifier’s COM and 70V terminals.

To connect the transformers’ primary taps, follow these steps.

1. Connect the desired primary taps to the amplifier’s 70V terminal, as shown.

   Note: Usually, each speaker in a system uses the same tap wattage. If you want a particular speaker to have a higher volume level, use a higher wattage tap on its transformer.

2. Connect the COM (common) taps on the transformers’ primary side to the amplifier’s COM (common) terminal, as shown.

Connecting the Secondary Taps

To connect the secondary taps of each transformer, follow these steps.

1. Connect the speaker’s positive (+) terminal to the transformer’s secondary tap that matches the speaker’s impedance.

2. Connect the speaker’s negative (−) terminal to the COM (common) tap on the transformer’s secondary side.
SPEAKER PLACEMENT

Finding the best speaker placement requires some experimenting. For the best results, point the speakers toward the listeners, and mount the speakers slightly above the level of the listeners' heads. The following drawings show recommended speaker placements for typical, narrow, and wide sound coverage.

**Hint:** If you need to place speakers far apart, point them toward the main listening area so that the speakers' coverage areas overlap. This helps prevent *dead spots* (areas not covered by the speakers' sound).
Before you use your amplifier, be sure you choose a proper location. Avoid placing the amplifier near a heat source such as a vent, radiator, and so on. Also, be sure there is adequate ventilation. For example, avoid placing the amplifier on thick carpeting. Doing so can restrict the air flow.

Follow these steps to use your amplifier.

1. Set MASTER VOLUME and the mixing controls (MIC 1, MIC 2, and AUX/PHONO) to 0.

2. Press in POWER. The POWER indicator lights.

3. If you connected a source to the PHONO or AUX input jacks, set the AUX/PHONO switch to the proper position.

   **Note:** A phonograph and an auxiliary source can be connected at the same time, but you can operate only one of these devices at a time.

4. Start the sound source.

5. Set MASTER VOLUME to 10. Then, adjust the mixing controls (MIC 1, MIC 2, and AUX/PHONO) for the desired volume and balance.

6. Adjust the FREQUENCY EQUALIZER controls to adjust the sound level for three different frequency ranges (150 Hz — low sounds, 1 kHz — middle sounds, and 6 kHz — high sounds) with +/- 12 dB. At the center position, the sound is not affected.

   After you get the desired sound, adjust MASTER VOLUME as desired.

   **Caution:** Be careful not to raise the volume level too high. Doing so might cause the system to overload.

7. When you finish using the amplifier, press POWER to turn off the amplifier.

**Using the Priority Terminals**

You can connect any SPST (single-pole, single throw) switch to the amplifier’s PRIORITY terminals. Activating this switch gives priority to the MIC 1 input and disables all other inputs. This is ideal for paging or making announcements.

You can use normal two-conductor wire up to 200 feet long to connect the SPST switch. Your local Radio Shack store sells several SPST switches and the appropriate wire for this connection. Refer to the switch’s owner’s manual for specific connection instructions.
TROUBLESHOOTING

If you have problems with the amplifier, use the following checklist to find the problem:

• Check all the connections.

• Be sure none of the speaker wiring, microphone cables, or other connecting cables are defective.

• Be sure you have provided adequate ventilation.

• Be sure you correctly calculated the total speaker impedance.

• Be sure there is no defective microphone connected.

• Be sure the speaker wire you use is a large enough gauge: 18-gauge for lengths of wire up to 25 feet and 16-gauge for lengths over 25 feet. For the best results, we recommend you use the shortest length of wire possible.

• If you have feedback problems, reposition the microphones and speakers and adjust the FREQUENCY EQUALIZER controls if necessary.

• If the amplifier does not work at all, check the amplifier's fuse (on the back panel). If the fuse is blown, replace it with the supplied spare fuse or an identical 2-amp, 250-volt fuse.

If none of the above solves the problem, take the amplifier to your local Radio Shack store. Our personnel will assist you and arrange for service, if needed.
Your MPA-45 PA Amplifier is an example of superior design and craftsmanship. The following suggestions will help you care for the amplifier so that you can enjoy it for years.

Keep the amplifier dry. If it does get wet, wipe it dry immediately. Liquids can contain minerals that corrode electronic circuits.

Use and store the amplifier only in normal temperature environments. Temperature extremes can shorten the life of electronic devices, and distort or melt plastic parts.

Handle the amplifier gently and carefully. Dropping it can damage the circuit boards and case and can cause the amplifier to work improperly.

Keep the amplifier away from dust and dirt, which can cause premature wear of parts.

Wipe the amplifier with a dampened cloth occasionally to keep the amplifier looking new. Do not use harsh chemicals, cleaning solvents, or strong detergents to clean it.
SPECIFICATIONS

Output Power at 4 ohms 1kHz, 5% THD .................................. 35 watts
Power Bandwidth at 10W, 5% THD ........................................ 40Hz — 45kHz
T.H.D. at 20W, 1kHz with 30kHz Low Pass Filter
  MIC 1 ................................................................. 0.13%
  MIC 2 ................................................................. 0.13%
  AUX ................................................................. 0.06%
  PHONO ............................................................... 0.5%
Input Sensitivity at 5% THD, 1kHz
  MIC 1 ................................................................. 2.2mV
  MIC 2 ................................................................. 2.2mV
  AUX (L/R EACH) .................................................. 150mV
  PHONO (L/R EACH) ............................................... 2.4mV
Signal-to-Noise Ratio (Input Shorted) with 30kHz Low Pass Filter
  MIC 1 ................................................................. 65dB
  MIC 2 ................................................................. 65dB
  AUX ................................................................. 71dB
  PHONO ............................................................... 61dB
Frequency Response at 4 ohms 1W +/-3dB
  MIC 1 ................................................................. 67Hz — 20kHz
  MIC 2 ................................................................. 67Hz — 20kHz
  AUX ................................................................. 67Hz — 20kHz
  PHONO (RIAA 100Hz/10kHz) .................................. +12.7dB/-12.8dB
Frequency Equalizer Controls, (Aux Input, 2V/4 OHMS Output)
  150Hz ............................................................. +/-12dB
  1kHz ............................................................... +/-12dB
  6kHz ............................................................... +/-12dB
Hum and Noise at 4 ohms with 30kHz Low Pass Filter
  at Master Volume Min ........................................... 0.19mV
  at Master Volume Max (Other Min, Tone Center) ............ 3.2mV
Power Requirement .................................................. 120V AC 60Hz
Dimensions (H×W×D) .................................................. 77×290×195 mm
Weight ................................................................. 9.7 Lbs
RADIO SHACK LIMITED WARRANTY
This product is warranted against defects for 1 year from date of purchase from Radio Shack company-owned stores and authorized Radio Shack franchisees and dealers. Within this period, we will repair it without charge for parts and labor. Simply bring your Radio Shack sales slip as proof of purchase date to any Radio Shack store. Warranty does not cover transportation costs. Nor does it cover a product subjected to misuse or accidental damage.
EXCEPT AS PROVIDED HEREIN, RADIO SHACK MAKES NO WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. Some states do not permit limitation or exclusion of implied warranties; therefore, the aforesaid limitation(s) or exclusion(s) may not apply to the purchaser.
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