User Guide

Power Amplifiers

MPA 601-70V and MPA 601-100V

60W Analog Power Amplifiers

Extron

68-2512-01 Rev. C
01 19

Safety Instructions

Safety Instructions • English

WARNING: This symbol, ⚠,when used on the product, is intended to alert the user of the presence of uninsulated dangerous voltage within the product's enclosure that may present a risk of electric shock.

ATTENTION: This symbol, ⚠, when used on the product, is intended to alert the user of important operating and maintenance (servicing) instructions in the literature provided with the equipment.

For information on safety guidelines, regulatory compliances, EMI/EMF compatibility, accessibility, and related topics, see the Extron Safety and Regulatory Compliance Guide, part number 68-290-01, on the Extron website, **www.extron.com.**

Sicherheitsanweisungen • Deutsch

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VORSICHT: Dieses Symbol ⚠ auf dem Produkt soll dem Benutzer in der im Lieferumfang enthaltenen Dokumentation besonders wichtige Hinweise zur Bedienung und Wartung (Instandhaltung) geben.

Weitere Informationen über die Sicherheitsrichtlinien, Produkthandhabung, EMI/EMF-Kompatibilität, Zugänglichkeit und verwandte Themen finden Sie in den Extron-Richtlinien für Sicherheit und Handhabung (Artikelnummer 68-290-01) auf der Extron-Website, **www.extron.com**.

Instrucciones de seguridad • Español

ADVERTENCIA: Este símbolo, ⚠, cuando se utiliza en el producto, avisa al usuario de la presencia de voltaje peligroso sin aislar dentro del producto, lo que puede representar un riesgo de descarga eléctrica.

ATENCIÓN: Este símbolo, ⚠, cuando se utiliza en el producto, avisa al usuario de la presencia de importantes instrucciones de uso y mantenimiento recogidas en la documentación proporcionada con el equipo.

Para obtener información sobre directrices de seguridad, cumplimiento de normativas, compatibilidad electromagnética, accesibilidad y temas relacionados, consulte la Guía de cumplimiento de normativas y seguridad de Extron, referencia 68-290-01, en el sitio Web de Extron, **www.extron.com**.

Instructions de sécurité • Français

AVERTISSEMENT : Ce pictogramme, ⚠, lorsqu'il est utilisé sur le produit, signale à l'utilisateur la présence à l'intérieur du boîtier du produit d'une tension électrique dangereuse susceptible de provoquer un choc électrique.

ATTENTION : Ce pictogramme, ⚠, lorsqu'il est utilisé sur le produit, signale à l'utilisateur des instructions d'utilisation ou de maintenance importantes qui se trouvent dans la documentation fournie avec le matériel.

Pour en savoir plus sur les règles de sécurité, la conformité à la réglementation, la compatibilité EMI/EMF, l'accessibilité, et autres sujets connexes, lisez les informations de sécurité et de conformité Extron, réf. 68-290-01, sur le site Extron, **www.extron.com**.

Istruzioni di sicurezza • Italiano

AVVERTENZA: Il simbolo, ⚠, se usato sul prodotto, serve ad avvertire l'utente della presenza di tensione non isolata pericolosa all'interno del contenitore del prodotto che può costituire un rischio di scosse elettriche.

ATTENTZIONE: Il simbolo, ⚠, se usato sul prodotto, serve ad avvertire l'utente della presenza di importanti istruzioni di funzionamento e manutenzione nella documentazione fornita con l'apparecchio.

Per informazioni su parametri di sicurezza, conformità alle normative, compatibilità EMI/EMF, accessibilità e argomenti simili, fare riferimento alla Guida alla conformità normativa e di sicurezza di Extron, cod. articolo 68-290-01, sul sito web di Extron, **www.extron.com**.

Instrukcje bezpieczeństwa • Polska

OSTRZEŻENIE: Ten symbol, ⚠, gdy używany na produkt, ma na celu poinformować użytkownika o obecności izolowanego i niebezpiecznego napięcia wewnątrz obudowy produktu, który może stanowić zagrożenie porażenia prądem elektrycznym.

UWAGI: Ten symbol, ⚠, gdy używany na produkt, jest przeznaczony do ostrzegania użytkownika ważne operacyjne oraz instrukcje konserwacji (obsługi) w literaturze, wyposażone w sprzęt.

Informacji na temat wytycznych w sprawie bezpieczeństwa, regulacji wzajemnej zgodności, zgodność EMI/EMF, dostępności i Tematy pokrewne, zobacz Extron bezpieczeństwa i regulacyjnego zgodności przewodnik, część numer 68-290-01, na stronie internetowej Extron, **www.extron.com**.

Инструкция по технике безопасности • Русский

ПРЕДУПРЕЖДЕНИЕ: Данный символ, ⚠, если указан на продукте, предупреждает пользователя о наличии неизолированного опасного напряжения внутри корпуса продукта, которое может привести к поражению электрическим током.

ВНИМАНИЕ: Данный символ, ⚠, если указан на продукте, предупреждает пользователя о наличии важных инструкций по эксплуатации и обслуживанию в руководстве, прилагаемом к данному оборудованию.

Для получения информации о правилах техники безопасности, соблюдении нормативных требований, электромагнитной совместимости (ЭМП/ЭДС), возможности доступа и других вопросах см. руководство по безопасности и соблюдению нормативных требований Extron на сайте Extron: , **www.extron.com**, номер по каталогу - 68-290-01.

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警告: ⚠产品上的这个标志意在警告用户该产品机壳内有暴露的危险 电压, 有触电危险。

注意: ⚠产品上的这个标志意在提示用户设备随附的用户手册中有重要的操作和维护(维修) 说明。

关于我们产品的安全指南、遵循的规范、EMI/EMF 的兼容性、无障碍使用的特性等相关内容，敬请访问 Extron 网站 , **www.extron.com**，参见 Extron 安全规范指南，产品编号 68-290-01。

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警告:若產品上使用此符號，是為了提醒使用者，產品機殼內存在著可能會導致觸電之風險的未絕緣危險電壓。

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有關安全性指導方針、法規遵守、EMI/EMF 相容性、存取範圍和相關主題的詳細資訊，請瀏覽 Extron 網站：**www.extron.com**，然後參閱《Extron 安全性與法規遵守手冊》，準則編號 68-290-01。

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安全上のご注意、法規厳守、EMI/EMF適合性、その他の関連項目については、エクストロンのウェブサイト **www.extron.com** より『Extron Safety and Regulatory Compliance Guide』(P/N 68-290-01) をご覧ください。

안전 지침 • 한국어

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안전 가이드라인, 규제 준수, EMI/EMF 호환성, 접근성, 그리고 관련 항목에 대한 자세한 내용은 Extron 웹 사이트(**www.extron.com**)의 Extron 안전 및 규제 준수 안내서, 68-290-01 조항을 참조하십시오.

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FCC Class B Notice

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules. These limits provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. There is no guarantee that interference will not occur. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, you are encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

In order to maintain compliance with FCC regulations, shielded cables must be used with this equipment. Operation with non-approved equipment or unshielded cables is likely to result in interference to radio and TV reception. The user is cautioned that changes and modifications made to the equipment without the approval of the manufacturer could void the user's authority to operate this equipment.

NOTE: For more information on safety guidelines, regulatory compliances, EMI/EMF compatibility, accessibility, and related topics see the Extron Safety and Regulatory Compliance Guide on the Extron website.

Conventions Used in this Guide

Notifications

The following notifications are used in this guide:

ATTENTION:

- Risk of property damage.
- Risque de dommages matériels.

NOTE: A note draws attention to important information.

TIP: A tip provides a suggestion to make working with the application easier.

Specifications Availability

Product specifications are available on the Extron website, **www.extron.com**.

Extron Glossary of Terms

A glossary of terms is available at **http://www.extron.com/technology/glossary.aspx**.

Contents

Introduction

This section provides an overview of the MPA 601-70V and MPA 601-100V Mini Power Amplifiers and covers the following topics:

About this Guide

This guide contains information about the Extron MPA 601-70V and MPA 601-100V Mini Power Amplifiers with instructions for experienced installers on how to install, configure, and operate the equipment.

In this guide the terms, “MPA 601-70V,” “MPA 601-100V,” “MPA,” “device,” and “amplifier” are used interchangeably to refer to this product unless otherwise specified.

Important Safety Instructions

- Read these instructions.
- Keep these instructions.
- Heed all warnings.
- Follow all instructions.
- Do not use this apparatus near water.
- Clean only with a dry cloth.
- Do not block any ventilation openings.
- Install in accordance with the instructions of the manufacturer.
- Do not install near any heat sources such as radiators, heat registers, stoves, or any other apparatus that produces heat.
- Do not defeat the safety purpose of the polarized or grounding-type plug.
  - A polarized plug has two blades with one wider than the other.
  - A grounding type plug has two blades and a third grounding prong.
  - The wide blade or the third prong are provided for safety.
  - If the provided plug does not fit into the outlet, consult an electrician for replacement of the obsolete outlet.
- Protect power cables from being walked on or pinched. This should be especially avoided at plugs, convenience receptacles, and points where the cables exit from the device.

- Only use attachments or accessories specified by the manufacturer.
- Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer or sold with the apparatus. When a cart is used, use caution when moving the cart or apparatus combination to avoid injury from tipping over.
- Unplug this device during lightning storms or when unused for long periods of time.
- Refer all servicing to qualified service personnel. Servicing is required when the amplifier has been damaged in any way, such as if the power supply cable or plug have been damaged, the amp has been dropped, liquid has been spilled on the amplifier, objects have fallen into the amplifier, the amplifier has been exposed to rain or moisture, or any time the amplifier does not operate normally.

About the MPA 601-70V and MPA 601-100V

The Extron MPA 601 power amplifiers are ENERGY STAR® qualified mono amplifiers delivering 60 watts RMS output power. It is in a 1U high, quarter rack width, convection cooled, and UL2043 plenum rated enclosure that meets UL requirements for in-ceiling installations. The MPA 601 is a highly efficient advanced Class D amplifier design using Extron's patented CDRS (Class D Ripple Suppression) technology, providing a smooth, clean audio waveform and an improvement in signal fidelity over conventional Class D amplifiers. Three stereo inputs are summed together so three separate sources can be connected without altering performance.

The MPA 601 power amplifiers are ideal for applications that have restricted space concerns or limited rack space, but require enough power for a small to medium distributed audio system. As such, the MPA 601 can be used in small racks, within a credenza, within a lectern, or mounted behind a display in a lobby or commons location.

The unit complies with UL2043 for smoke and heat release for in-the-ceiling installations. It can be installed in the plenum space of the ceiling. Alternatively, the unit can be mounted on a tabletop, in a rack, under a desk, or in a projector mounting kit.

Features

- **Inputs: Balanced or unbalanced stereo or mono on a captive screw connector; unbalanced stereo or mono on RCA connectors; 3.5 mm stereo mini jack**
  - **Speaker Outputs: 5 mm screw-lock captive screw connector**
- **60 watts RMS output power**—
  - **MPA 601-70V** - 1 x 60 watts @ 70 volts
  - **MPA 601-100V** - 1 x 60 watts @ 100 volts
- **Professional grade signal-to-noise of >90 dB and <0.1% THD+N** — Ultra-low noise performance makes the MPA 601 ideal for use in applications where fidelity is critical.
- **ENERGY STAR® qualified amplifier** — The MPA 601 is an ENERGY STAR qualified amplifier and energy efficient product that conserves energy and reduces costs.
- **Bass, treble, and input level controls** — Provides the ability to properly set gain structure and make tonal changes in simple systems for optimized sound quality.
- **Extron Patented CDRS™ - Class D Ripple Suppression** — CDRS is an Extron Patented technology that provides a smooth, clean audio waveform and an improvement in signal fidelity over conventional Class D amplifier designs. CDRS eliminates the high frequency switching ripple characteristic of Class D amplifiers, a source of RF emissions which can interfere with sensitive AV equipment such as wireless microphones.

- **Convection cooled, fanless design with UL 2043 plenum rated enclosure** — Operates without noisy fans and generates little heat in the rack or room. Can be installed above the ceiling when no rack is available.
- **Balanced and unbalanced buffered audio inputs** — Accepts balanced or unbalanced audio input signals on a captive screw connector, and unbalanced audio on both RCA connectors and a 3.5 mm stereo mini jack. The three inputs are individually buffered, and can be connected to three separate sources at the same time without altering performance.
- **Auto power-down with fast power-up** — The MPA 601 meets ENERGY STAR qualification requirements with an auto power-down feature that automatically places the amplifier into standby after 25 minutes of inactivity, dramatically reducing power consumption. It quickly returns to full power status in less than one second upon signal detection.
- **Defeatable auto-standby timer** — Automatic timed standby feature can be disabled for sensitive applications that require uninterrupted operation.
- **Automatic clip limiter** — Detects actual onset of clipping by comparing input and output waveforms. Gain is automatically reduced without audible artifacts to protect speakers from clipping distortion.
- **Remote volume and mute control port** — In basic installations without control systems, this port allows the MPA 601 to be remotely controlled using the optional Extron VCM 110 or VCM 200 analog volume and mute controller or VC 50 analog volume controller.
- **5 mm screw-lock captive screw speaker connector** — Enables simple, secure connections with 22 to 12 AWG speaker cables.
- **Rack-mountable 1U, quarter rack width metal enclosure**
- **Extron Everlast™ power supply included** — Provides worldwide power compatibility, with high demonstrated reliability and low power consumption.

Application Diagram

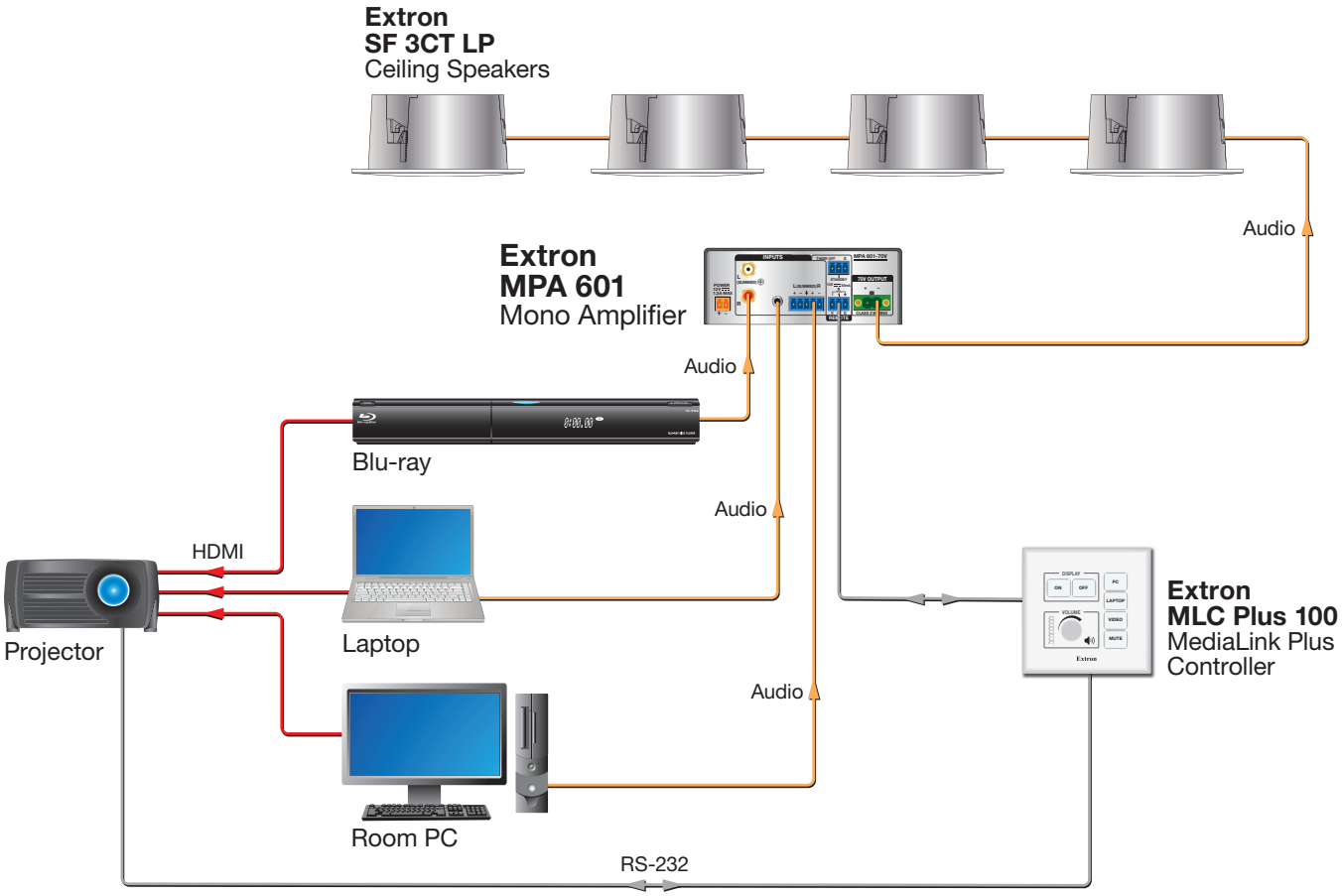
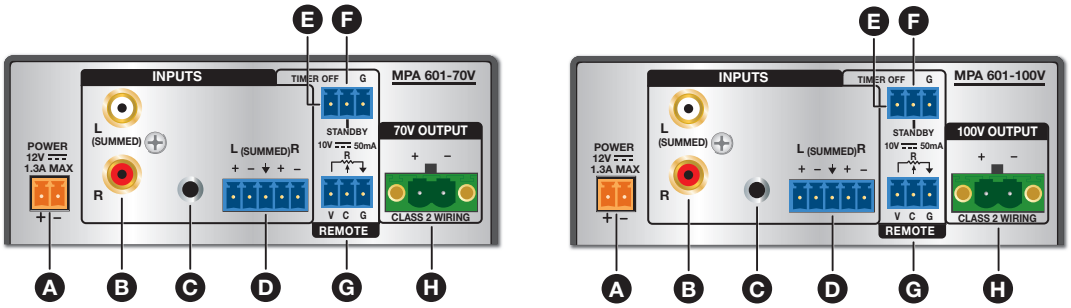


Figure 1. **MPA 601 Application Diagram**

Installation

This section provides a description of the MPA 601-70V and MPA 601-100V rear panel connections and instructions for cabling.

Rear Panel Connections



- **A** Power Connector
- **B** **RCA Audio Input Connectors**
- **C** **3.5 mm TRS Input Connector**
- **D** **Balanced or Unbalanced Audio Input Connector**
- **E** **Timer Off Pin Connector**
- **F** **Standby Pin Connector**
- **G** **Remote Input Connector**
- **H** **Speaker Output Connection**

Figure 2. MPA 601-70V and MPA 601-100V Rear Panel Connections

A Power Connector — A 50W desktop power supply is provided. Connect one end of the DC power cord to one of the 2-pole 3.5 mm captive screw outlets on the power supply. Connect the other end into the power connector on the rear panel of the amplifier as shown above. The power cord connectors are correctly wired when shipped (see **figure 3** on the next page for instructions on connecting the power supply).

ATTENTION:

- When the PS 1242 power supply is connected to the MPA 601, it must not be shared with any other device.
- Lorsque la source d'alimentation PS 1242 est connectée au MPA 601, elle ne peut être utilisée pour alimenter un autre appareil.

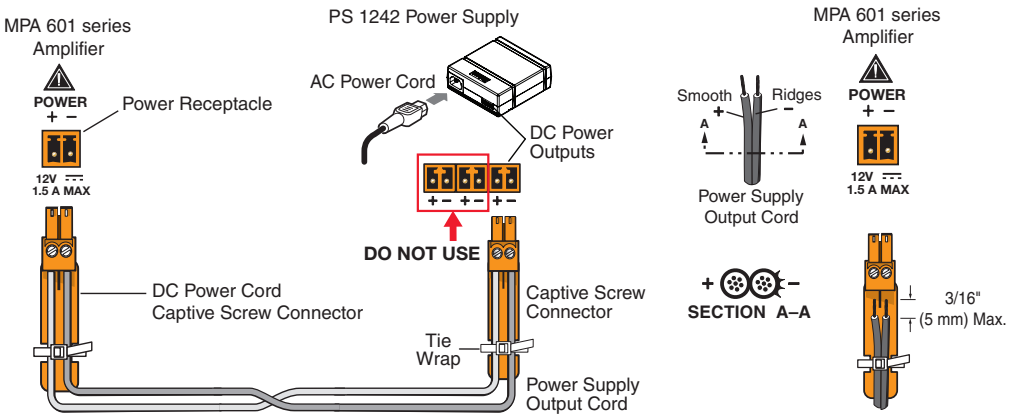


Figure 3. Connecting the PS 1242 Power Supply to the MPA 601 Amplifier

ATTENTION:

- Always use a power supply provided by or specified by Extron. Use of an unauthorized power supply voids all regulatory compliance certification and may cause damage to the supply and the end product.
- Utilisez toujours une source d'alimentation fournie ou recommandée par Extron. L'utilisation d'une source d'alimentation non autorisée annule toute conformité réglementaire et peut endommager la source d'alimentation ainsi que le produit final.

- Suitable for use in environmental air space in accordance with Section 300.22.C of the National Electrical Code, and Sections 2-128, 12 010(3) and 12-100 of the Canadian Electrical Code, Part 1, C22.1.
- Convient à une utilisation dans les conduits d'aération, en accord avec la section 300.22.C du code national d'électricité américain, et avec les sections 2-128, 12-010(3) et 12-100 du code d'électricité canadien, partie 1, C22.1.

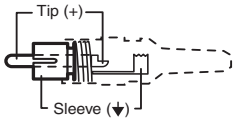
- Unless otherwise stated, the AC/DC adapters are not suitable for use in air handling spaces or in wall cavities.
- Sauf mention contraire, les adaptateurs AC/DC ne sont pas appropriés pour une utilisation dans les espaces d'aération ou dans les cavités murales.

- The installation must always be in accordance with the applicable provisions of National Electrical Code ANSI/NFPA 70, article 725 and the Canadian Electrical Code part 1, section 16.
- Cette installation doit toujours être en accord avec les mesures qui s'applique au National Electrical Code ANSI/NFPA 70, article 725, et au Canadian Electrical Code, partie 1, section 16.

ATTENTION:
• The power supply shall not be permanently fixed to building structure or similar structure. • La source d'alimentation ne devra pas être fixée de façon permanente à une structure de bâtiment ou à une structure similaire.
• Although the amplifier is plenum rated, the power supply provided with it is not. Cables to and from the amplifier must also be plenum rated. The power supply must not be placed in the plenum space. The DC power cord provided with the unit is not plenum rated. • Bien que l'amplificateur soit conforme à la norme relative aux faux plafonds, la source d'alimentation fournie avec ne l'est pas. Les câbles depuis et vers l'amplificateur doivent aussi être classés plenum. La source d'alimentation ne doit pas être placée dans l'espace plenum. Le cordon d'alimentation DC fourni avec l'unité n'est pas classé plenum.
• The length of the exposed wires in the stripping process is **critical**. • La longueur des câbles exposés est **primordiale** lorsque l'on entreprend de les dénuder.
• The ideal length is 3/16 inches (5 mm). Any longer and the exposed wires may touch, causing a short circuit between them. Any shorter and the wires can be easily pulled out even if tightly fastened by the captive screws. • La longueur idéale est de 5 mm (3/16 inches). S'ils sont un peu plus longs, les câbles exposés pourraient se toucher et provoquer un court circuit. S'ils sont un peu plus courts, ils pourraient sortir, même s'ils sont attachés par les vis captives.
• Do not tin the wires. Tinned wires are not as secure in the captive screw terminals and could pull out. • Ne pas étamer les câbles. Les câbles étamés ne sont pas aussi bien fixés dans les terminaisons des à vis captives et pourraient sortir.

B **RCA Audio Input Connectors** — These connectors (see **figure 2** on page 5) accept unbalanced, line level audio signal. The input can be stereo, using two RCA connectors, or mono, using a single RCA connector plugged into the left (summed) connector.

If unused, the connectors automatically terminate to lower the noise floor.

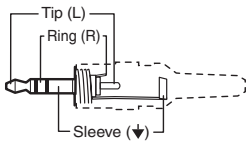


RCA Connector

Figure 4. RCA Wiring Example

C **3.5 mm TRS Input Connector** — This connector (see **figure 2** on page 5) accepts unbalanced, line level audio signal through a 3.5 mm tip ring sleeve (TRS) connector.

If unused, the connector automatically terminates to lower the noise floor.



3.5 mm TRS Connector

Figure 5. 3.5 mm TRS Wiring Example

D **Balanced or Unbalanced Audio Input Connector** — This 5-pole 3.5 mm captive screw connector (see **figure 2** on page 5) accepts line level, balanced or unbalanced, mono or stereo audio signal. Figure 6 below shows connector wiring for the appropriate input type.

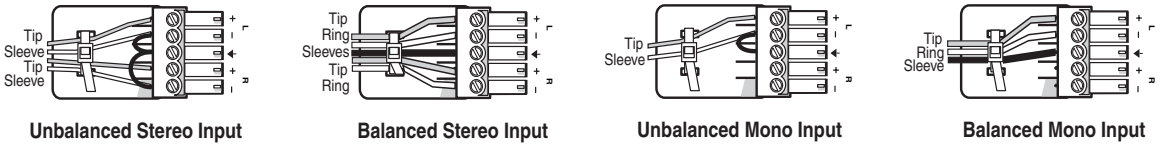


Figure 6. Audio Input Connector Wiring Example

ATTENTION:

- The length of the exposed wires in the stripping process is critical. The ideal length is 3/16 inch (5 mm). If the exposed portion is longer, the wires may touch, causing a short circuit between them. If the exposed wires are shorter, they can be easily pulled out, even if tightly fastened by the captive screws.
- La longueur des câbles exposés est primordiale lorsque l'on entreprend de les dénuder. La longueur idéale est de 5 mm (3/16 inches). S'ils sont un peu plus longs, les câbles exposés pourraient se toucher et provoquer un court circuit. S'ils sont un peu plus courts, ils pourraient sortir, même s'ils sont attachés par les vis captives.

- Do not tin the wires. Tinned wire does not hold its shape and can become loose over time.
- Ne pas étamer les câbles. Les câbles étamés ne sont pas aussi bien fixés dans les terminaisons des à vis captives et pourraient sortir.

E **Timer Off Pin Connector** —When the **TIMER OFF** pin is shorted to ground, the **STANDBY** timer is disabled and the amplifier does not automatically go into Standby mode after 25 minutes (±5 minutes). The MPA 601 can still be forced into standby mode using the **STANDBY** pin, even if the timer has been defeated.

F **Standby Pin Connector** — When the **STANDBY** pin is shorted to ground, it forces the MPA 601 to go into standby mode. The front panel power LED turns amber to indicate when the MPA 601 is in standby.

When the short is removed from the **STANDBY** pin, the unit may remain in standby mode, depending on certain conditions:

- The **STANDBY** timer is enabled.
- The input signal is below the signal input detection threshold.
- The timeout interval since the last detection of a signal has elapsed.

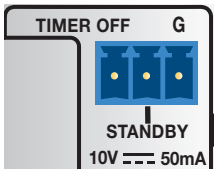


Figure 7. Standby Port Connector

G **Remote Input Connector** —This 3-pole captive screw connector (see **figure 2** on page 5) allows a wall-mounted audio controller to control volume and mute remotely (for more information on operating a remote controller see **Remote Control Operation** on page 11).

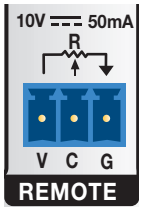


Figure 8. Remote Input Connector

H **Speaker Output Connector** — This 2-pole 5 mm screw-lock captive screw connector (see **figure 2** on page 5) is used to connect speakers to the amplifier. The MPA 601-70V provides up to 60W for a 70V distributed sound system, while the MPA 601-100V provides up to 60W for a 100V distributed sound system.

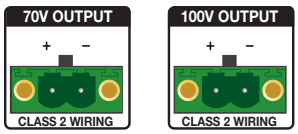


Figure 9. MPA Speaker Output Connector

ATTENTION:

- Do not ground or short the speaker outputs as this will damage the amplifier.
- Ne pas mettre à la terre ni créer de court-circuit dans les sorties de l'enceinte, afin d'éviter tout risque de détérioration de l'amplificateur.

The MPA 601 amplifiers sum the left and right signals from both the TRS and RCA inputs to form Sum 1 (see figure 10 below). Sum 1 is then weighted. At the same time, the amplifier sums the left and right signals from the captive screw input to form Sum 2. Sum 1 and Sum 2 are then summed together to form a single mono signal.

NOTE: All inputs are buffered.

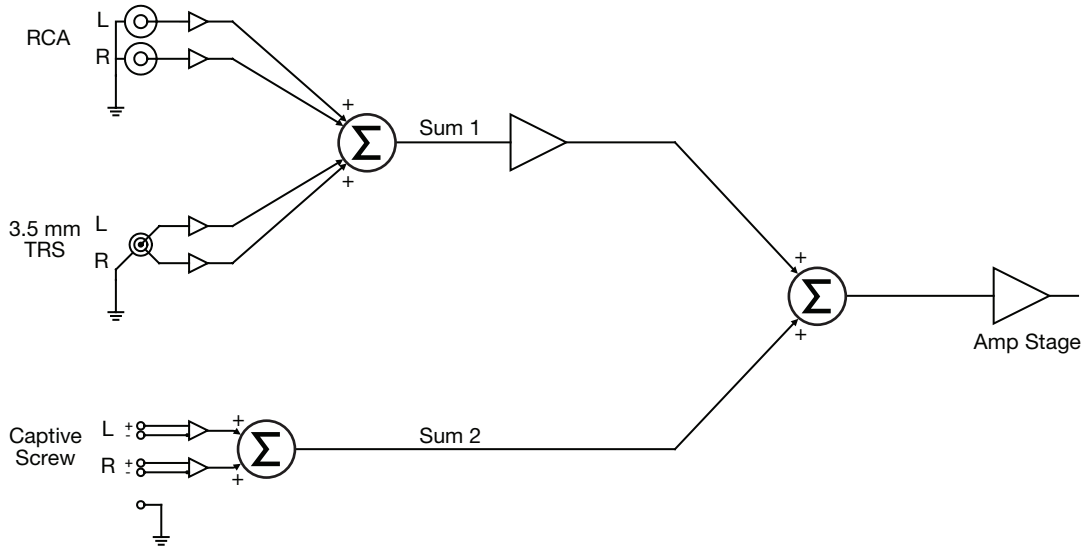


Figure 10. MPA 601 Signal Summing Diagram

Operation

This section provides information about the front panel features and operation of the MPA 601 and covers the following topics:

- **Front Panel Features**
- **Setting Input Level**
- **Setting Bass and Treble**
- **Remote Control Operation**
- **Troubleshooting**

Front Panel Features

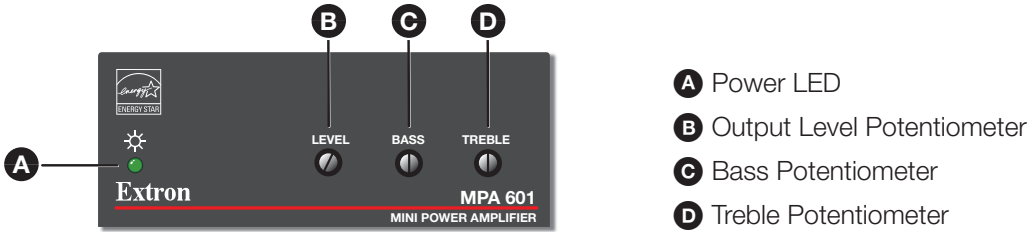


Figure 11. MPA 601-70V and MPA 601-100V Front Panel

NOTE: The front panels of the MPA 601-70V and MPA 601-100V are identical.

A **Power LED** — Lights green when the unit is fully on and amber when the unit is in standby mode.

B **Output Level Potentiometer** — Adjusts the amount of attenuation applied to the input signal.

C **Bass Potentiometer** — Adjusts the amount of attenuation or gain applied to the bass frequencies of the input signal (±10 dB ≤ 100 Hz).

D **Treble Potentiometer** — Adjusts the amount of attenuation or gain applied to the treble frequencies of the input signal (±10 dB ≥ 10 kHz).

Setting Input Level

To adjust the attenuation of the input signal:

1. If necessary, unplug the remote connector from the unit.
2. If connecting the amplifier to a system with adjustable volume, use a flat head screwdriver (such as the provided Extron Tweeker) to adjust the **LEVEL** potentiometer to its minimum setting (fully counterclockwise).
3. Set the system volume to its maximum level. No sound should come out.
4. Slowly increase the amplifier **LEVEL** until sound distortion starts to occur (rotate potentiometer clockwise). Lower the **LEVEL** slightly until the distortion disappears. This setting ensures that whatever the system volume setting may be, no clipping occurs.

Setting Bass and Treble

NOTES:

- When the potentiometer is at the center detent (vertical), the frequency response is flat. Turning the **BASS** or **TREBLE** potentiometers counterclockwise will decrease the output level at the specified frequencies, while turning the potentiometers clockwise will increase the level at the specified frequencies.
- Increasing the bass or treble levels after the input level has been set may result in clipping.
- Exercise caution when adjusting the bass. It is possible to saturate the transformer cores of high impedance speakers if the bass is set incorrectly.

To adjust the bass and treble:

1. Using a small flat head screwdriver (such as the provided Extron Tweeker), adjust the **BASS** potentiometer to increase or decrease the bass shelving ±10 dB at 100 Hz and below.
2. Using a small flat head screwdriver (such as the provided Extron Tweeker), adjust the **TREBLE** potentiometer to increase or decrease the treble shelving ±10 dB at 10 kHz and above.

Remote Control Operation

Options for remote control include the Extron VC 50, VCM 110 AAP, VCM 200 series, MLA VC10 Plus, and select MLC controllers. For information on these devices, including part numbers, go to **www.extron.com**. Third party 10k potentiometer volume controllers can also be used for remote volume and mute control.

See figure 12 and the bullets below for wiring the VCM 110 MAAP. Wiring for the other Extron remote control units is similar.

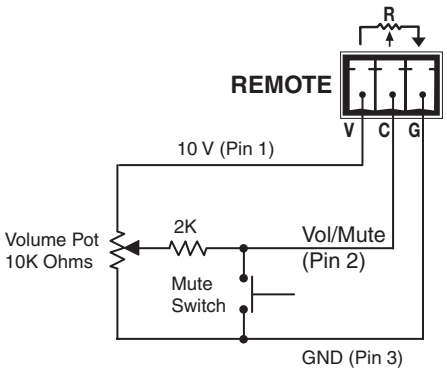


Figure 12. Remote Control Wiring

- Pin 1 is 10 VDC reference voltage.
- Pin 2 (Vol/Mute) can be used as a variable voltage input between 0 and 10 VDC with 0V providing full attenuation and 10V providing no attenuation. It can also be used for remote control muting. Sound is muted while the pin is shorted to ground.
- Pin 3 is ground.

NOTE: All nominal levels are ±10%.

Controlling Multiple Amplifiers with One Remote Controller

Several MPA 601 units can be daisy-chained so that one volume controller can simultaneously regulate the volume of all the amplifiers.

NOTES:

- As additional amplifiers are added to the daisy chain, the sensitivity of the remote control volume potentiometer will change. The maximum level (fully clockwise) will not be affected. However, the effectiveness of the minimum level (fully counterclockwise) in reducing the volume to inaudible levels decreases as more amplifiers are added to the daisy chain.
- When more than two MPA units are attached to the chain, sound may begin to be heard even if the levels have been set to their lowest. Muting the output can be achieved with a contact closure button attached between the Vol/Mute and Ground pin of the first MPA in the chain.

To regulate multiple amplifiers with a single remote controller:

1. Attach all three pins of the volume controller to the corresponding pins on the first MPA 601 unit (ground to ground, Vol/Mute to Vol/Mute, and 10V to 10V).
2. Use jumper wires to connect the Vol/Mute pins of the first amplifier to the Vol/Mute pins of each successive amplifier.
3. Use jumper wires to connect the Ground pins of the first amplifier to the Ground pins of each successive amplifier.

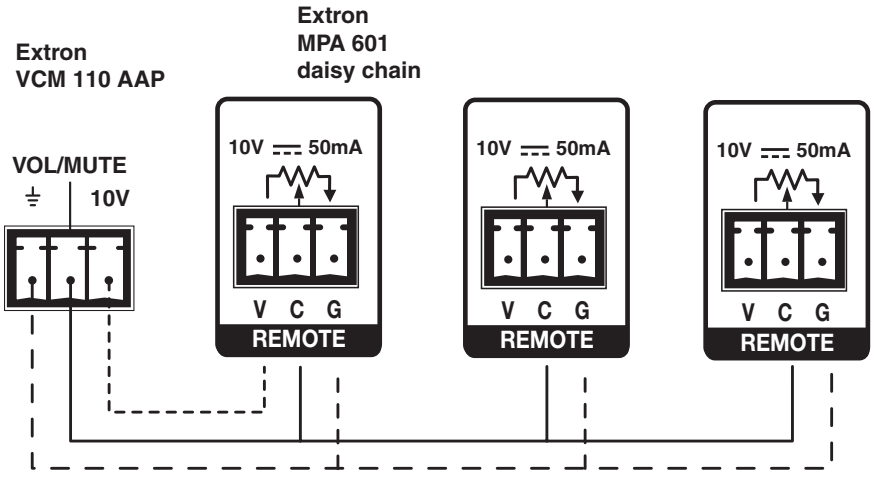


Figure 13. Regulating Multiple Amps with a Single Remote Wiring Example

NOTE: The 10V pin of the remote controller connects to the first MPA 601 only. There are no jumper wires linking it to subsequent amplifiers.

Control Options

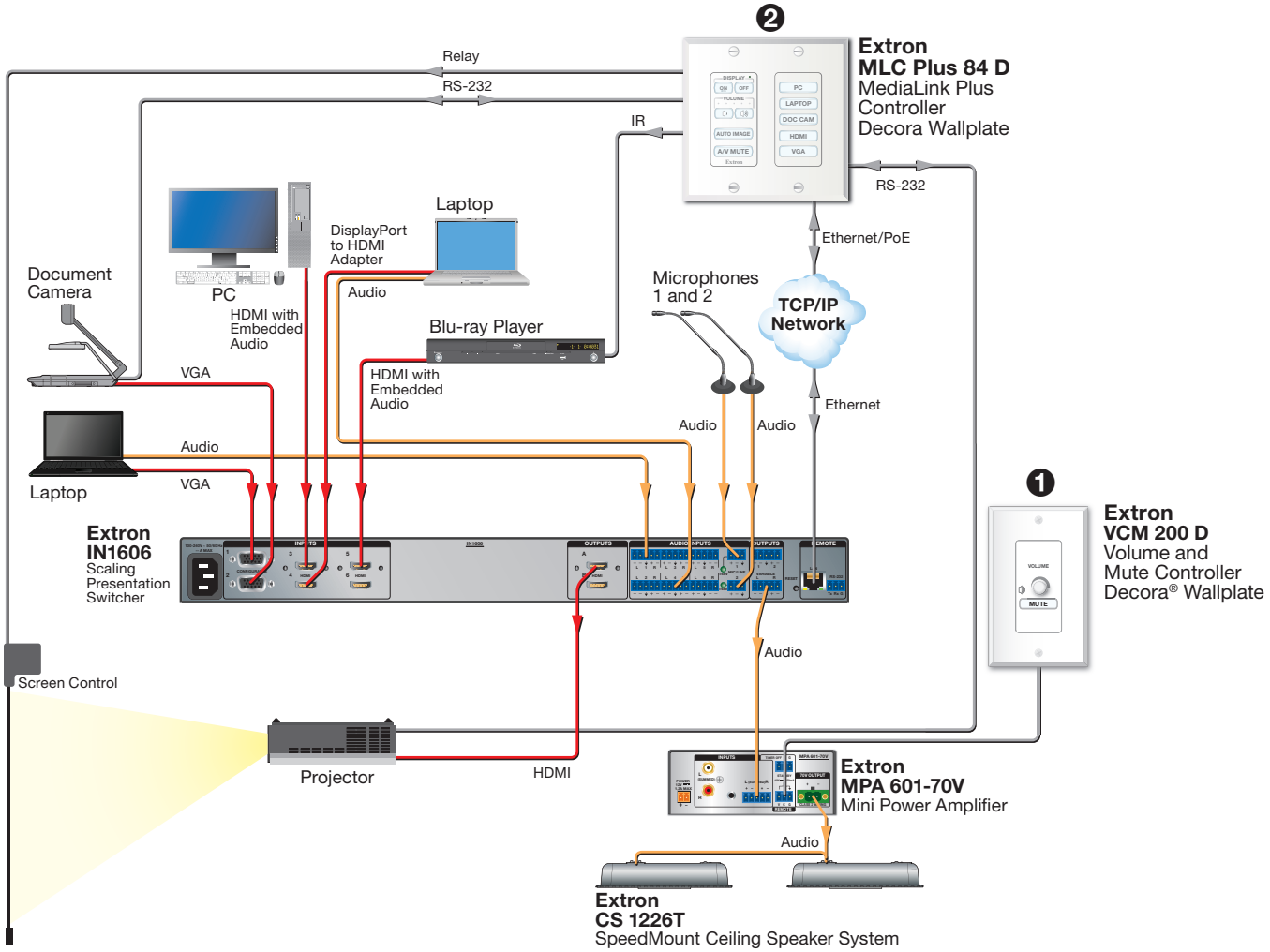


Figure 14. Direct and Indirect Remote Control Options

❶ **Direct Remote Control** — For a system designed to control the volume of the amplifier directly, use a 10k Ohm potentiometer to control volume via the rear panel remote port on the MPA 601 (see **figure 2**, Ⓖ on page 5). In figure 14 above, a VCM 200 D adjusts the level on the MPA 601 directly. Follow instructions found in the control product user guide.

❷ **Indirect Remote Control** — For a system with variable audio output, connect the audio source output to the input of the MPA 601. In figure 14 above, an MLC Plus 84 D adjusts the audio level on the audio source via a network connection. Follow the instructions in the control product user guide.

NOTE: The diagram above is for illustrative purposes only. Only one type of remote control (direct or indirect) should be used to control the volume in any given system.

Troubleshooting

Under different circumstances, the front panel LED lights green or amber, which provides diagnostic information.

Amplifier Fails to Exit Standby Mode Promptly

Power LED Color	Problem Description	Problem Solution
Amber	No output signal.	• No input detected: verify that there is an input signal. If a signal is present, raise the input level. • The amplifier is in standby mode and the output has been turned off. Check the remote port.
Green or Amber	Slow to exit standby mode when a signal is present.	• The input signal may be too weak. Raise the input level.
Amber	DC Fault is detected on either channel. The unit does not exit standby.	• DC Fault may have been detected. Disconnect power then disconnect the remote port (if connected). Next, reconnect power to the unit to determine if the unit immediately goes into standby upon power up. In such a case, the unit should be serviced.

Amplifier Enters Standby Mode Too Early

Power LED Color	Problem Description	Problem Solution
Green or Amber	Enters standby mode early.	• The input signal may be too weak. Raise the input level.

Mounting

This section provides information about the various ways to mount the MPA 601 and covers the following topics:

Plenum Placement

The MPA 601-70V and MPA 601-100V amplifiers are plenum rated for heat and smoke release. They can be installed in the ceiling, out of sight, with reduced risk of theft.

ATTENTION:

- Although the amplifier is plenum rated, the power supply provided with it is not. Cables to and from the amplifier must also be plenum rated. The power supply must not be placed in the plenum space. The DC power cord provided with the unit is not plenum rated.
- Bien que l'amplificateur soit conforme à la norme relative aux faux plafonds, la source d'alimentation fournie avec ne l'est pas. Les câbles depuis et vers l'amplificateur doivent aussi être classés plenum. La source d'alimentation ne doit pas être placée dans l'espace plenum. Le cordon d'alimentation DC fourni avec l'unité n'est pas classé plenum.

Tabletop Placement

Attach the four provided rubber feet to the bottom of the unit and place it on a convenient tabletop location.

Rack Mounting

The following Underwriters Laboratories (UL) guidelines are relevant to the safe installation of these products in a rack:

- **Elevated operating ambient temperature** — If the equipment is installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack may be greater than room ambient temperature. Therefore, install the equipment in an environment compatible with the maximum ambient temperature specified by Extron (TMA = +122°F, +50°C).
- **Reduced air flow** — Install the equipment in the rack so that the amount of air flow required for safe operation of the equipment is not compromised.
- **Mechanical loading** — Mount the equipment in the rack so that uneven mechanical loading does not create a hazardous condition.
- **Circuit overloading** — When connecting the equipment to the supply circuit, consider the effect that circuit overloading might have on overcurrent protection and supply wiring. Consider equipment nameplate ratings when addressing this concern.
- **Reliable earthing (grounding)** — Maintain reliable grounding of rack-mounted equipment. Pay particular attention to supply connections other than direct connections to the branch circuit (such as the use of power strips).

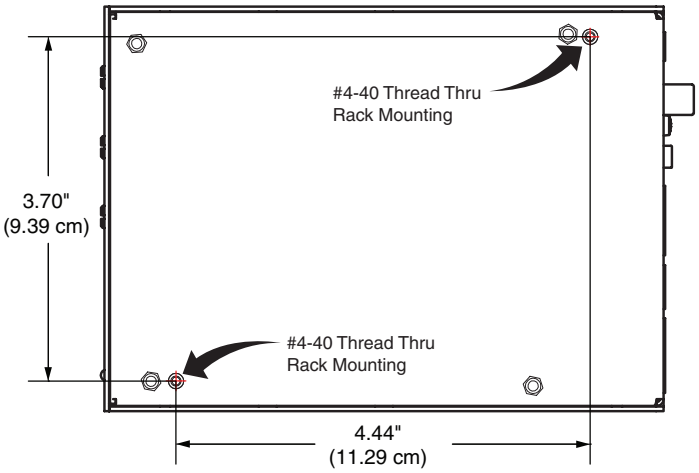


Figure 15. Points for Securing the Base of the MPA 601 to a Rack

ATTENTION:

- Use only the two holes indicated in the diagram above for mounting the MPA 601. The other four holes anchor stand-offs for the internal circuit boards. Using them may damage the amplifier and will not provide secure mounting for the unit.
- Utilisez uniquement les deux trous indiqués dans le schéma ci-dessus pour monter le MPA 601. Les quatre autres trous fixent des entretoises pour les circuits imprimés internes. Leur utilisation pourrait endommager l'amplificateur et n'offira ainsi aucune solution de montage sécurisé de l'unité.

Under-Desk, Through-Desk, and Projector Mounting

The MPA 601 can be mounted under a desk, through a desk, or above a projector. For the appropriate mounting kit, go to **www.extron.com**. Follow the instructions provided with each kit.

Extron Warranty

Extron Electronics warrants this product against defects in materials and workmanship for a period of three years from the date of purchase. In the event of malfunction during the warranty period attributable directly to faulty workmanship and/or materials, Extron Electronics will, at its option, repair or replace said products or components, to whatever extent it shall deem necessary to restore said product to proper operating condition, provided that it is returned within the warranty period, with proof of purchase and description of malfunction to:

USA, Canada, South America, and Central America:
Extron Electronics
1230 South Lewis Street
Anaheim, CA 92805
U.S.A.

Japan:
Extron Electronics, Japan
Kyodo Building, 16 Ichibancho
Chiyoda-ku, Tokyo 102-0082
Japan

Europe and Africa:
Extron Europe
Hanzeboulevard 10
3825 PH Amersfoort
The Netherlands

China:
Extron China
686 Ronghua Road
Songjiang District
Shanghai 201611
China

Asia:
Extron Asia Pte Ltd
135 Joo Seng Road, #04-01
PM Industrial Bldg.
Singapore 368363
Singapore

Middle East:
Extron Middle East
Dubai Airport Free Zone
F13, PO Box 293666
United Arab Emirates, Dubai

This Limited Warranty does not apply if the fault has been caused by misuse, improper handling care, electrical or mechanical abuse, abnormal operating conditions, or if modifications were made to the product that were not authorized by Extron.

NOTE: If a product is defective, please call Extron and ask for an Application Engineer to receive an RA (Return Authorization) number. This will begin the repair process.

USA: 714.491.1500 or 800.633.9876
Asia: 65.6383.4400
Europe: 31.33.453.4040
Japan: 81.3.3511.7655

Units must be returned insured, with shipping charges prepaid. If not insured, you assume the risk of loss or damage during shipment. Returned units must include the serial number and a description of the problem, as well as the name of the person to contact in case there are any questions.

Extron Electronics makes no further warranties either expressed or implied with respect to the product and its quality, performance, merchantability, or fitness for any particular use. In no event will Extron Electronics be liable for direct, indirect, or consequential damages resulting from any defect in this product even if Extron Electronics has been advised of such damage.

Please note that laws vary from state to state and country to country, and that some provisions of this warranty may not apply to you.