CX *Power Amplifier*

User Guide

harman specialty group
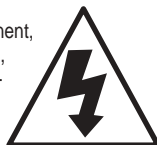
IMPORTANT SAFETY INSTRUCTIONS

1) Read these instructions.

2) Keep these instructions.

3) Heed all warnings.

4) Follow all instructions.

5) Do not use this apparatus near water.

6) Clean only with a dry cloth.

7) In CE countries, this amplifier is considered "professional equipment." In order to comply with CE requirements, the customer is required to obtain permission from the local supply authority before connecting this equipment.

8) Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.

9) Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatuses that produce heat.

10) 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 is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.

11) Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.

12) Only use attachments/accessories specified by the manufacturer.

13) Use only with a cart, stand, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.

14) Unplug this apparatus during lightning storms or when unused for long periods of time.

15) Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

16) To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.

This triangle, which appears on your component, alerts you to the presence of uninsulated, dangerous voltage inside the enclosure - voltage that may be sufficient to constitute a risk of shock.

CAUTION

**RISK OF ELECTRIC SHOCK
DO NOT OPEN**

This triangle, which appears on your component, alerts you to important operating and maintenance instructions in this accompanying literature.

Lexicon

3 Oak Park
Bedford, MA 01730-1413 USA
Tel 781-280-0300
Fax 781-280-0490
www.harmanspecialtygroup.com

Customer Support
Tel 781-280-0300
Fax 781-280-0495 (Sales)
Fax 781-280-0499 (Service)

harman specialty group

DOCUMENTATION CONVENTIONS

This document contains general safety, installation, and operating instructions for the CX-7 and CX-5 Power Amplifiers. It is important to read this user guide before attempting to use these products. Pay particular attention to safety instructions.

The following symbols are used in this document:

⚡ Appears on the component to indicate the presence of uninsulated, dangerous voltage inside the enclosure – voltage that may be sufficient to constitute a risk of shock.

CAUTION Calls attention to a procedure, practice, condition or the like that, if not correctly performed or adhered to, could result in injury or death.

WARNING Calls attention to a procedure, practice, condition or the like that, if not correctly performed or adhered to, could result in damage to or destruction of part or all of the product.

Note: Calls attention to information that is essential to highlight.

Introduction

Section 1: Getting Started

Section 2: Basic Operation

Section 3: Troubleshooting and Maintenance

Appendix

Index

US UNPACKING AND INSPECTION

After unpacking the unit, save all packing materials in case the unit ever needs to be shipped. Thoroughly inspect the modules and packing materials for signs of damage. Report any damage to the carrier at once; report equipment malfunction to the dealer.

DE AUSPACKEND UND INSPEKTION

Überprüfen Sie die Verpackung auf Beschädigung. Nehmen Sie das Gerät aus der Verpackung. Heben Sie das gesamte Verpackungsmaterial auf, falls das Gerät einmal verschickt werden muss. Überprüfen Sie alle Bestandteile auf Beschädigung. Verständigen Sie sofort den Spediteur, falls die Verpackung und/oder die Bestandteile der Lieferung beschädigt sind. Verständigen Sie sofort Ihren Händler, falls das Gerät nicht richtig funktioniert.

ES DESEMPAQUETANDO E INSPECCIÓN

Después de desempaquetar la unidad, ahorra todos los materiales del embalaje en caso de que usted alguna vez necesita enviar la unidad. Completamente inspeccione los módulos y condensando los materiales para las señales de daño. Informe cualquier daño en seguida al portador; el funcionamiento defectuoso de equipo de informe a su distribuidor.

FR DÉBALLER ET INSPECTIÓN

Après avoir déballé l'unité, sauve toutes les matières de l'emballage au cas où vous avez besoin jamais de transporter l'unité. Entièrement inspectez les modules et emballer des matières pour signes de dégât. Rapportez tout dégât au porteur à la fois; fonctionnement défectueux du matériel du rapport à votre revendeur.

IT SPACCHETTANDO ED ISPEZIONE

Dopo avere spacchettato l'unità, mai salvi tutti i materiali di imballaggio in caso che Lei ha bisogno di inviare l'unità. Completamente ispezioni i moduli e comprimendo materiali per segnali di danno. Subito riporti alcun danno al corriere; malfunzionamento di attrezzatura di rapporto al Suo rivenditore.

PT DESEMPACOTANDO E INSPEÇÃO

Depois de desempacotar a unidade, economiza todos os materiais de embalagem no caso de você já precisa transportar a unidade. Completamente inspecione os módulos e empacotando materiais para sinais de dano. Informe qualquer dano imediatamente ao portador; mau funcionamento de equipamento de relatório para seu negociante.

1

Getting Started

ABOUT THE CX POWER AMPLIFIERS

Thank you for purchasing a CX Power Amplifier, a reference-quality amplifier, which is based on the award-winning LX amplifier and is designed to meet the highest standards of power and performance under even the most extreme operating conditions. Equipped with advanced thermal, current, DC, and speaker protection, the CX amplifiers deliver reliable and exceptional performance with most loudspeakers, including mismatched, reactive, and unusual loads. In addition, the CX amplifiers include protection against short circuits, component failures, miswiring, and internal faults.

Available in seven or five channel versions, the CX amplifiers deliver high-power performance. Each 140-Watt channel includes four custom-designed, hand-graded output transistors All channels are capable of driving speaker impedances of 2Ω and above.

Complemented by gold-plated speaker output connectors, the rear panel includes selectable balanced or unbalanced audio input via RCA and XLR connectors. A trigger input connector allows the CX amplifiers to be controlled with associated components such as the MC-12 or MC-8 Digital Controller. In addition, a ground lift switch for each channel can be used to eliminate audible hum caused by multiple grounding paths.

The CX amplifiers include advanced thermal, current, and DC protection for each channel. Thermal protection monitors the temperature of the chassis and heatsinks and automatically deactivates the specific channel(s) when they exceed their normal safe operating temperature. Current protection ensures that the output transistors are protected by limiting the current capability which is determined by the output voltage, while DC protection prevents DC and frequencies below 10Hz from reaching the speakers. Dedicated channel status LEDs are located on the front panel

to provide at-a-glance viewing of channel status at all times.

With THX Ultra2 Certification, the CX amplifiers are certified to meet the highest THX standards. Advanced thermal, current, DC, and speaker protection further guarantee exceptional performance under even the most extreme operating conditions. Add to this incredible power and wide-ranging flexibility, and the CX amplifiers are at home in the most sophisticated and demanding home theaters.

HIGHLIGHTS

- 140 Watts per channel

- Four custom designed, hand-graded output transistors per channel

- Oversized toroidal power transformer with extraordinarily low DC resistance and thermal protection

- High-power supply voltage for extra headroom at the outputs

- Stable with mismatched, reactive, or unusual loads

- Compatible with 2Ω speaker impedances

- THX Ultra2 Certification

- Thermal protection against overheating

- Speaker protection against DC and frequencies below 10Hz

- Protection against short circuits, device failures, miswiring, and internal faults

- Trigger input for power control from an external device

- RCA and XLR inputs

- GROUND LIFT switch per channel

- Gold plated input and output connectors

- Rack-mount option available

PRODUCT REGISTRATION

Please register the CX Power Amplifier within 15 days of purchase. To do so, register online at www.harmanspecialtygroup.com or complete and return the product registration card attached to the back cover of this user guide. The product registration card serves no warranty purposes. Retain the sales receipt as proof of warranty coverage.

INSTALLATION CONSIDERATIONS

The CX Power Amplifiers require special care during installation to ensure optimal performance. Leave at least 2 inches of open space around the top, sides, and rear of the amplifier for proper ventilation. If the amplifier is installed in an equipment rack, an optional rack-mount kit is available from Lexicon dealers or at www.harmanspecialtygroup.com.

CAUTION	• Be careful when moving the CX Power Amplifiers, which are quite heavy.
	• Do not obstruct the ventilation holes in the chassis.

2

Basic Operation

FRONT PANEL OVERVIEW

1. Standby Button

Activates and deactivates standby mode when the CX amplifier is powered on with the rear panel power switch. The standby button performs no function when the CX amplifier is powered off with the rear panel power switch, or when the trigger switch is set to ON or DELAY (see page 2-7 for more detail).

When the unit is on, pressing the standby button activates standby mode and deactivates the CX amplifier. When the unit is in standby, pressing the standby button deactivates standby mode and activates the CX amplifier. The red standby button LED will flash for approximately seven seconds. Then, the blue channel status LEDs will light. If the red standby button LED flashes rapidly and the blue channel status LEDs do not light, the incoming AC voltage is too low or the temperature of the transformer is too high. Refer to Section 3 for troubleshooting information.

Note:

• *Power is still supplied to the CX amplifier when standby mode is activated.*

2. Channel Status LEDs

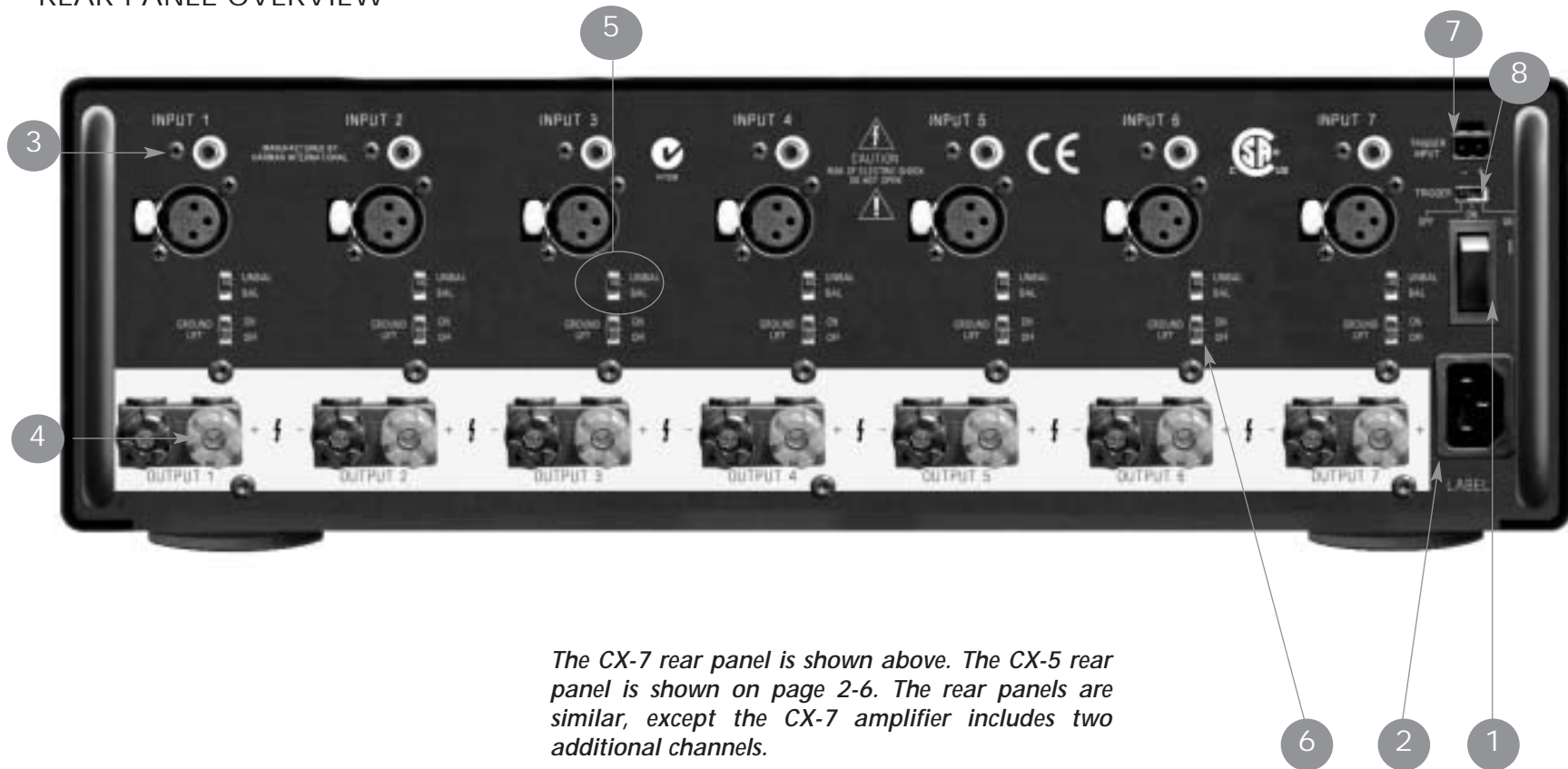Provide an at-a-glance view of the status of each channel as indicated in the table below:

Color	Status
Constant Blue	Normal Operation
Constant Bright Blue	Indicates the audio signal is clipping. Reduce volume level to help eliminate potentially damaging audio signals from reaching the speakers.
Flashing Blue	The temperature of the individual amplifier heatsink is above 95˚C. If this occurs, the channel will not pass audio. The channel status LED will return to constant blue when the temperature of the amplifier card returns to normal. Then the channel will automatically resume passing audio.
All Channels Flashing Blue	The temperature of the chassis is above 58˚C, and the amplifier will no longer pass audio. After the chassis temperature returns to normal, all the channel status LEDs will return to constant blue and the amplifier will resume normal operation.

Note:

When the main power transformer temperature exceeds 100˚C:
* *the transformer will deactivate*
* *the channel status LEDs will no longer be lit*
* *the red standby LED will flash rapidly*

REAR PANEL OVERVIEW

The CX-7 rear panel is shown above. The CX-5 rear panel is shown on page 2-6. The rear panels are similar, except the CX-7 amplifier includes two additional channels.

⚡ | **WARNING** | External wiring connected to connectors marked with the icon pictured at the left requires installation by a qualified person or the use of ready-made leads or cords.

1. Power Switch

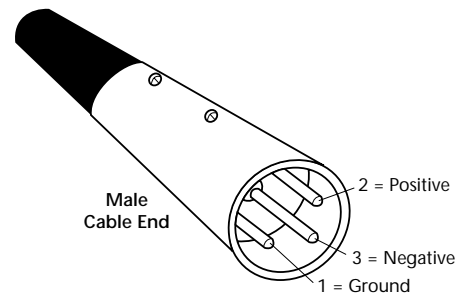Disconnects power to the AC Input Connector. Set this switch to off when making or breaking connections to the amplifier.

2. AC Input Connector

The AC input connector provides power to the unit with the supplied power cord (3 conductor, 14AWG). Do not use an extension cord. For optimal performance, use an isolated power receptacle with adequate current (at least 15 Amps). Line voltages ≥10% above the specified voltage may damage the amplifier. Line voltages ≥10% below the specified voltage may cause the amplifier to enter a protection mode, indicated by the red standby LED flashing.

3. INPUT 1 to 7 (CX-7) or 1 to 5 (CX-5)

Provide audio input for the speakers connected to the corresponding audio outputs. When using the unbalanced (RCA) audio inputs, make sure the UNBAL/BAL switch located below each XLR connector is set to UNBAL. When using the balanced (XLR) audio inputs, make sure the UNBAL/BAL switch is set to BAL. The illustration below shows the appropriate cable pin-out for XLR connectors.

**Male
Cable End**

2 = Positive

3 = Negative

1 = Ground

4. OUTPUT 1 to 7 (CX-7) or 1 to 5 (CX-5)

Provide audio output for the speakers. OUTPUT connectors can accept bare speaker wires, banana plug connectors, or certain spade connectors. When using bare speaker wires, loosen the connector, insert the wire into the top of the receptacle, then tighten the connector. The same procedure should be used for spade connectors. Banana plugs should be inserted into the outward-facing receptacle.

Use heavy gauge speaker cable to ensure low-impedance connections between the amplifier and the speakers. Observe correct speaker polarity.
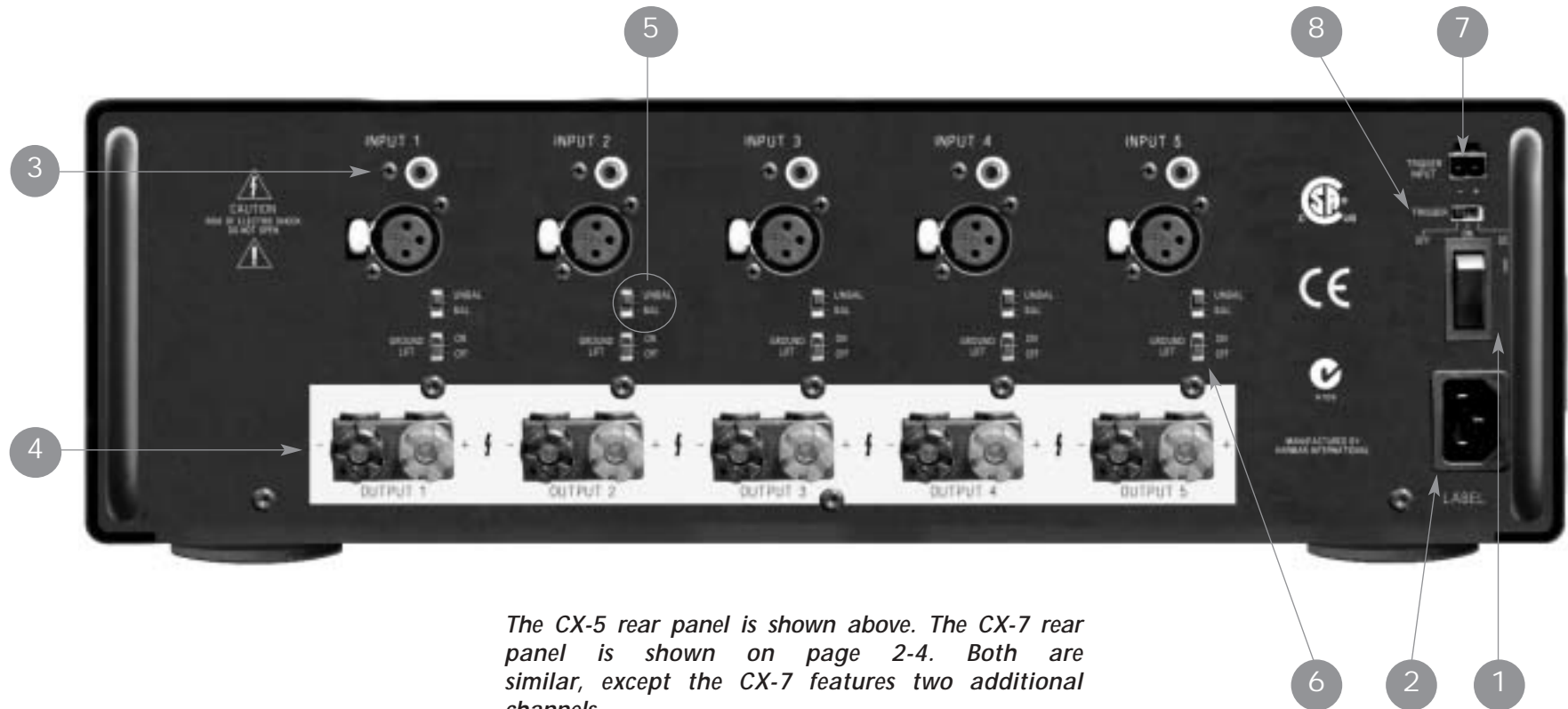
WARNING	Do not connect the OUTPUTs of one channel to the OUTPUTs of other channels or to other amplifiers.

Note:

Speakers must have impedance ratings of 2Ω or higher. Using speakers with lower than recommended impedance ratings might activate protection modes.

REAR PANEL OVERVIEW *(continued)*

The CX-5 rear panel is shown above. The CX-7 rear panel is shown on page 2-4. Both are similar, except the CX-7 features two additional channels.

| **WARNING** | External wiring connected to connectors marked with the icon pictured at the left requires installation by a qualified person or the use of ready-made leads or cords. |

5. UNBAL/BAL Switch

Selects between unbalanced (RCA) or balanced (XLR) audio input for each channel. Power the amplifier off or reduce system volume before changing the setting of the UNBAL/BAL switch. If the amplifier is connected to a digital controller such as the MC-12 or MC-8, output levels should be re-calibrated whenever the setting is changed.

6. GROUND LIFT Switches

When set to ON, isolates the ground connection between that channel's audio inputs and the chassis. This can be useful for eliminating audible hum or noise caused by multiple grounding paths in the system. When set to OFF, the audio input is grounded to the chassis. This switch should be set to ON whenever there is ground noise present in the system.

7. TRIGGER INPUT

Enables the amplifier to be controlled by the MC-12/MC-8 or other external devices with a 12V DC trigger output. Connect the trigger output of the external device to the TRIGGER INPUT of the amplifier, and set the TRIGGER switch on the amplifier to ON or DELAY. The amplifier will automatically respond when the external device is powered on and off.

8. TRIGGER INPUT Switch

When set to OFF, the amplifier only powers on and off in response to the front panel standby button. When set to ON or DELAY, only the external device connected to the TRIGGER INPUT can be used to power the amplifier on and off. The front panel standby button will not power the unit on and off. (However, the standby LED still functions normally.)

| WARNING | Do not defeat or remove the ground prong on the AC power cord. This will result in a safety hazard, and will not reduce audible hum. The GROUND LIFT switches have no affect on the safety ground of the amplifier. |

PROTECTION MODES

The CX amplifiers are equipped to protect against overheating and miswiring, as well as electrical failures such as short circuits, device failures, internal faults, and DC output to the speakers.

THERMAL PROTECTION

The amplifier includes thermal protection for each channel, the main power transformer, and chassis. If a heatsink temperature exceeds 95˚C, the channel will deactivate and the corresponding channel status LED will flash blue. When the heatsink cools to normal operating temperature, the channel will automatically reactivate and the corresponding channel status LED will return to constant blue.

If the amplifier chassis exceeds a temperature of 58˚C, the amplifier will shut down all channels and all the channel status LEDs will flash blue. When the chassis cools to normal operating temperature, all of the channels will automatically reactivate and the channel status LEDs will return to steady blue.

If the main power transformer temperature exceeds 100˚C, the transformer will deactivate, all channel status LEDs will no longer be lit, and the red standby LED will flash rapidly. Once the transformer has cooled, it will automatically be reset and the amplifier will operate normally. The channel status LEDs will return to constant blue, and the red standby LED will no longer be lit.

CURRENT PROTECTION

The CX amplifiers use a combination of voltage and current information to protect the output transistors. The amount of current capable of being delivered to the load is dependent on how much voltage appears across the output transistors. Inversely, this means that the more output voltage available, the more current capability available, which translates into higher power output.

In addition to the voltage and current thermal protection, the CX amplifiers have a time dependent instantaneous current limit. The amplifier is capable of delivering 20 amps peak into a load for a short duration of time.

DC PROTECTION

Each channel includes DC protection to prevent DC and frequencies below 10Hz from reaching the speakers. If this protection activates, the output relay will open and the corresponding front panel channel status LED will flash blue. After approximately 4-seconds, DC protection will be automatically deactivated. The relay will close and the corresponding channel status LED will return to constant blue. If DC or frequencies below 10Hz are still present, DC protection will be automatically reactivated. The amplifier will continue to engage this protection until the problem is no longer present.

2-8

3

Troubleshooting & Maintenance

TROUBLESHOOTING

No front panel LEDs are lit.

1. Make sure the unit is plugged in and the rear panel power switch is set to on.

The red Standby LED is flashing rapidly.

1. Power the amplifier off. Allow the amplifier to cool before powering it on again.

2. Check the incoming line voltage. It should not be more than 10% below the mains supply voltage indicated in the Specifications (page A-2).

One or more channels is not passing audio, and the corresponding channel status LED is flashing blue.

1. Reduce system volume level.

2. Power the amplifier off. Allow the amplifier to cool before powering it on again.

3. If the problem persists after the amplifier has cooled, contact an authorized Lexicon dealer or Harman Specialty Group Customer Service @ www.harmanspecialtygroup.com or 781-280-0300.

The standby button does not appear to be functioning.

1. Make sure the rear panel power switch is set to on.

2. Make certain the rear panel TRIGGER INPUT switch is set to OFF.

One or more channels is not passing audio, but the corresponding channel status LED is lit blue.

1. Reduce system volume level.

2. Make sure the UNBAL/BAL switch is set to the connector being used (UNBAL for RCA and BAL for XLR).

Audio sounds out-of-phase.

1. Check to ensure proper speaker wiring.

A humming sound is present in the audio.

1. Set the GROUND LIFT switches to ON.

One or more channels is outputting distorted sound.

1. Reduce system volume level.

2. Make sure speakers have compatible impedance ratings (see page 2-5).

The TRIGGER INPUT is connected to an external device, but the amplifer does not power on and off with the external device.

1. Make sure the TRIGGER INPUT switch is set to ON or DELAY.

The amplifier and other electrical devices in the listening room suddenly lose power.

1. Reset the circuit breakers for the affected device(s).

If all else fails . . .

1. Contact an authorized Lexicon dealer.

2. Contact Harman Specialty Group customer service @ www.harmanspecialty group.com.

Note:

Visit www.harmanspecialtygroup.com for answers to frequently asked questions and additional troubleshooting information.

MAINTENANCE

The following routine maintenance should be performed on a periodic basis:

- Clean the exterior surfaces of the unit with a soft, dry, lint-free cloth. Do not use alcohol, benzene, acetone-based cleaners, or strong commercial cleaners. Do not use a cloth made with steel wool or metal polish. If the unit is exposed to a dusty environment, a low-pressure blower may be used to remove dust from its exterior.

A

Appendix

SPECIFICATIONS

Audio Input Connectors	
CX-7	7 RCA, 7 XLR
CX-5	5 RCA, 5 XLR

Audio Output Connectors	
CX-7	7 pairs of gold-plated binding posts
CX-5	5 pairs of gold-plated binding posts

Performance	
Output Power	140W at 8Ω, all channels driven 20Hz to 20kHz
Minimum Speaker Impedance	2Ω
Frequency Response	• 20Hz to 20kHz ±0.1dB • 10Hz to 100kHz +0.5/-3dB
THD	Below 0.02% at 140W, 8Ω all channels driven 20Hz to 20kHz
Signal-to-Noise Ratio	110dB 22 kHz bandwidth, unweighted (Ref 140W at 8Ω)

Performance (Continued)	
IM Distortion	Below 0.03% at 140W, 8Ω
Crosstalk	80dB at 1kHz, minimum
Damping Factor	850 at 20Hz, minimum
Input Sensitivity	• 2V input for 100W output at 8Ω, balanced inputs • 1V input for 100W output at 8Ω, unbalanced inputs
Input Impedance	• 20kΩ, balanced • 10kΩ, unbalanced
Gain	• 23dB, balanced • 29dB, unbalaced

Other	
Trigger Input	12V DC +/- 10%
Power Requirements	• 120V 60Hz 15 Amp (domestic) • 230V 50Hz 10 Amp (export)
Weight	• CX-7: 52.8 lbs (24 kg) • CX-5: 47.1 lbs (21.4 kg)
Rack Mounting	Optional brackets are available for mounting either amplifier in standard 19-inch equipment rack

Specifications are subject to change without notice

DECLARATION OF CONFORMITY

Application of Council Directive(s):   89/336/EEC and 93/68/EEC

Standard(s) to which Conformity is Declared: EN 55103-1:1995, EN 61000-3-3:1995,
EN 55022:1992 (Class B), EN 55103-2:1996, and EN 60065:1998

Manufacturer: Harman Specialty Group
3 Oak Park
Bedford, MA 01730-1413 USA

The equipment identified here conforms to the Directive(s) and Standard(s) specified above.

Type of Equipment: CX-7 and CX-5 Power Amplifiers

Model: Lexicon CX-7 and CX-5

Date: July 2003

Harman Specialty Group
Vice President of Engineering
3 Oak Park
Bedford, MA 01730-1413 USA
Tel: 781-280-0300
Fax: 781-280-0490

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LIMITED WARRANTY

Harman Specialty Group offers the following warranty on this product:

What is the Duration of this Warranty?

This warranty will remain in effect for five (5) years from the original date of purchase.

Who is Covered?

This warranty may be enforced by the original purchaser and subsequent owners during the warranty period, provided the original dated sales receipt or other proof of warranty coverage is presented at time of service.

What is Covered?

This warranty covers all defects in material and workmanship on this product, except as specified below. The following are not covered:

1. Damage resulting from

    A. Accident, misuse, abuse, or neglect.

    B. Failure to follow instructions contained in the user guide.

    C. Repair or attempted repair unauthorized by Harman Specialty Group.

    D. Failure to perform recommended periodic maintenance.

    E. Causes other than product defects, including lack of skill, competence, or experience on the part of the owner.

2. Damage occurring during any shipment of this product. Claims for shipping damages must be made with the carrier.

3. Damage to a unit that has been altered, or on which the serial number has been defaced, modified, or removed.

What Expenses will Harman Specialty Group Assume?

Harman Specialty Group will pay all labor and material expenses for covered items. Payment of shipping charges is discussed in the next section of the warranty.

How is Service Obtained?

When this product needs service, write, telephone, or fax Harman Specialty Group to request information about where the unit should be taken or sent. When making a written request, please include your name, complete address, and daytime telephone number; the product model and serial numbers; and a description of the problem. Do not return the unit to Harman Specialty Group without prior authorization.

When Shipping a Product for Service . . .

1. Pay any initial shipping charges, which are the responsibility of the owner. If necessary repairs are covered by this warranty, Harman Specialty Group will pay return shipping charges to any destination in the United States using the carrier of our choice.

2. Pack the unit securely. Package insurance is strongly recommended.

3. Include a copy of the original dated sales receipt. (A copy of the original dated sales receipt must be presented whenever warranty service is required.)

4. Do not include accessories such as power cords or user guides unless instructed to do so.

What are the Limitations of Implied Warranties?

Any implied warranties, including warranties of merchantability and fitness for a particular purpose, are limited in duration to the length of this warranty.

What Certain Damages are Excluded?

Harman Specialty Group's liability for a defective product is limited to repair or replacement of that product, at our option. Harman Specialty Group shall not be liable for damages based on inconvenience; loss of use of the product; loss of time; interrupted operation; commercial loss; or any other damages, whether incidental, consequential, or otherwise.

How do State Laws Relate to this Warranty?

Some states do not allow limitations on the duration of implied warranties and/or the exclusion or limitation of incidental or consequential damages. As such, the above limitations may not apply.

This warranty is not enforceable outside of North America. This warranty provides specific legal rights. Additional rights may be provided by some states.

harman specialty group

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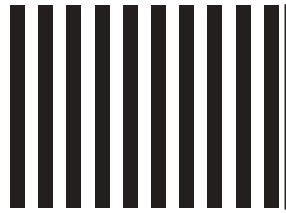Part No. 070-15879 | Rev 0 | 07/03

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