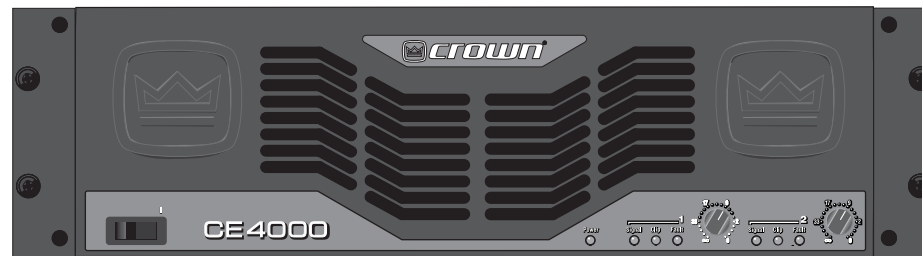




CE Series

Operation Manual



CE 4000

Obtaining Other Language Versions: To obtain information in another language about the use of this product, please contact your local Crown Distributor. If you need assistance locating your local distributor, please contact Crown at 574-294-8000.

This manual does not include all of the details of design, production, or variations of the equipment. Nor does it cover every possible situation which may arise during installation, operation or maintenance.

The information provided in this manual was deemed accurate as of the publication date. However, updates to this information may have occurred. To obtain the latest version of this manual, please visit the Crown website at www.crownaudio.com.

Trademark Notice: Crown, Crown Audio, Amcron and BCA are registered trademarks of Crown International. Other trademarks are the property of their respective owners.

Some models may be exported under the name Amcron.®

Important Safety Instructions

Importantes Instrucciones de Seguridad

- 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) Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
- 8) Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- 9) 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.
- 10) Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
- 11) Only use attachments/accessories specified by the manufacturer.
- 12) Use only with a 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/apparatus combination to avoid injury from tip-over.
- 13) Unplug this apparatus during lightning storms or when unused for long periods of time.
- 14) 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.
- 15) **WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPARATUS TO RAIN OR MOISTURE.**
- 16) **DO NOT EXPOSE TO DRIPPING OR SPLASHING. DO NOT PLACE OBJECTS FILLED WITH LIQUID, SUCH AS VASES, ON THIS APPARATUS.**



Wichtige Sicherheitsinstruktionen

Instrucciones de Seguridad Importantes

TO PREVENT ELECTRIC SHOCK DO NOT REMOVE TOP OR BOTTOM COVERS. NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

À PRÉVENIR LE CHOC ÉLECTRIQUE N'ENLEVEZ PAS LES COUVERTURES. IL N'Y A PAS DES PARTIES SERVICEABLE À L'INTÉRIEUR. TOUTS RÉPARATIONS DOIT ÊTRE FAIRE PAR PERSONNEL QUALIFIÉ SEULEMENT.

PARA PREVENIR UN CHOQUE ELÉCTRICO, NO RETIRE LAS CUBIERTAS SUPERIOR O INFERIOR. NO EXISTEN PARTES QUE PUEDAN SER REPARADAS POR EL USUARIO AL INTERIOR. REMITA EL SERVICIO AL PERSONAL TÉCNICO CALIFICADO.

TO COMPLETELY DISCONNECT THIS EQUIPMENT FROM THE AC MAINS, DISCONNECT THE POWER SUPPLY CORD PLUG FROM THE AC RECEPTACLE. THE MAINS PLUG OF THE POWER SUPPLY CORD SHALL REMAIN READILY OPERABLE.

POUR DÉMONTÉ COMPLÈTEMENT L'ÉQUIPEMENT DE L'ALIMENTATION GÉNÉRALE, DÉMONTÉ LE CÂBLE D'ALIMENTATION DE SON RÉCEPTACLE. LA PRISE D'ALIMENTATION RESTERA AISÉMENT FONCTIONNELLE.

PARA DESCONECTAR COMPLETAMENTE EL EQUIPO DEL SUMINISTRO ELÉCTRICO, DESCONECTE EL CABLE DE ALIMENTACION DE LA TOMA DE CA. LAS PATAS DEL CONECTOR DEL CABLE DE ALIMENTACION DEBERAN MANTENERSE EN BUEN ESTADO.

WATCH FOR THESE SYMBOLS:

The lightning bolt triangle is used to alert the user to the risk of electric shock.

The exclamation point triangle is used to alert the user to important operating or maintenance instructions.

REGARDEZ CES SYMBOLES

La triangle avec le sigle "foudre" est employée pour alerter l'utilisateur au risque de décharge électrique. Le triangle avec un point d'exclamation est employée pour alerter l'utilisateur d'instruction importantes pour lors opérations de maintenance.

ATENCION CON ESTOS SÍMBOLOS

El triángulo con el símbolo de rayo eléctrico es usado para alertar al usuario de el riesgo de un choque eléctrico.

El triángulo con el signo de admiración es usado para alertar al usuario de instrucciones importantes de operación o mantenimiento.



CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN

AVIS
RISQUE DE CHOC ÉLECTRIQUE
N'OUVREZ PAS



IMPORTANT

CE Series amplifiers require Class 2 output wiring. Les amplificateurs de série de CE exigent des câbles de sortie de classe 2. CE-Reihe-Verstärker verlangen Klasse die 2 Produktionsverdrahtung. Los amplificadores de la Serie CE requieren de un cableado de salida Clase 2.

MAGNETIC FIELD

CAUTION! Do not locate sensitive high-gain equipment such as preamplifiers or tape decks directly above or below the unit. Because this amplifier has a high power density, it has a strong magnetic field which can induce hum into unshielded devices that are located nearby. The field is strongest just above and below the unit.

If an equipment rack is used, we recommend locating the amplifier(s) in the bottom of the rack and the preamplifier or other sensitive equipment at the top.

FCC COMPLIANCE NOTICE

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

CAUTION: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: 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 are designed to 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 instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is 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.

Crown International, Inc.

DECLARATION OF CONFORMITY

Issued By: Crown International, Inc.
1718 W. Mishawaka Rd.
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35, Bassets Field
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Cardiff, South Glamorgan
CF14 9UG United Kingdom

Equipment Type: Commercial Audio Power Amplifiers

Family Name: CE

Model Names: CE4000

EMC Standards:

EN 55103-1:1995 Electromagnetic Compatibility - Product Family Standard for Audio, Video, Audio-Visual and Entertainment Lighting Control Apparatus for Professional Use, Part 1: Emissions

EN 55103-1:1995 Magnetic Field Emissions-Annex A @ 10 cm and 1 M

EN 61000-3-2:1995 Limitation for Harmonic Current Emissions (equipment input current $\leq 16A$ per phase)

EN 61000-3-3:1995 Limitation of Voltage Fluctuations and Flicker in Low-Voltage Supply Systems Rated Current $\leq 16A$

EN 55022:1992 + A1:1995 & A2:1997 Limits and Methods of Measurement of Radio Disturbance Characteristics of ITE: Radiated, Class B Limits; Conducted, Class B

EN 55103-2:1996 Electromagnetic Compatibility - Product Family Standard for Audio, Video, Audio-Visual and Entertainment Lighting Control Apparatus for Professional Use, Part 2: Immunity

EN 61000-4-2:1995 Electrostatic Discharge Immunity (Environment E2-Criteria B, 4k V Contact, 8k V Air Discharge)

EN 61000-4-3:1996 Radiated, Radio-Frequency, Electromagnetic Immunity (Environment E2, Criteria A)

EN 61000-4-4:1995 Electrical Fast Transient/Burst Immunity (Criteria B)

EN 61000-4-5:1995 Surge Immunity (Criteria B)

EN 61000-4-6:1996 Immunity to Conducted Disturbances Induced by Radio-Frequency Fields (Criteria A)

EN 61000-4-11:1994 Voltage Dips, Short Interruptions and Voltage Variation

Safety Standard:

EN 60065: 1998 Safety Requirements - Audio Video and Similar Electronic Apparatus

I certify that the product identified above conforms to the requirements of the EMC Council Directive 89/336/EEC as amended by 92/31/EEC, and the Low Voltage Directive 73/23/EES as amended by 93/68/EEC.

Signed



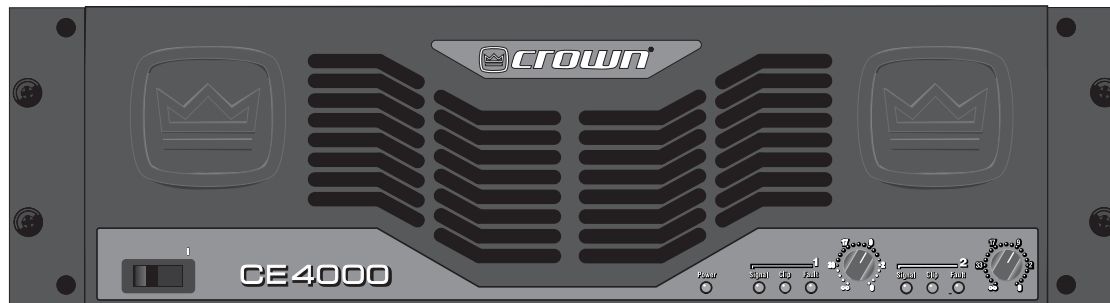
Larry Coburn

Title: Senior Vice President of Manufacturing

Date of Issue: June 27, 2000

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CE 4000	*1 kHz Power
2 ohm Dual	1400W**
4 ohm Dual	1200W
8 ohm Dual	600W
4 ohm Bridge-Mono	2800W**
8 ohm Bridge-Mono	2400W

*1 kHz Power: refers to maximum average power in watts at 1 kHz with 0.5% THD.
 ** ≥ 200-V line voltage provides 1800W (2 ohm dual) and 3600W (4 ohm bridge-mono)

1 Welcome

Crown® CE 4000 amplifiers have been engineered from the bottom up to provide superior power output, increased efficiency, legendary Crown sound and extraordinary reliability. They were designed using Crown's patented, award-winning BCA® (Balanced Current Amplifier) engineering.

Modern power amplifiers are sophisticated pieces of engineering capable of producing extremely high power levels. They must be treated with respect and correctly installed if they are to provide the many years of reliable service for which they were designed.

In addition, the CE 4000 amplifier includes a number of features which require some explanation before they can be used to their maximum advantage.

Please take the time to study this manual so that you can obtain the best possible service from your amplifier.

1.1 Features

- Patented, award-winning BCA technology.
- Switch-mode power supply with PFC (power-factor correction) allows universal use.
- Compatible with SST (System Solution Topologies) input modules.

- Sub-bass output via integral 4-position high-pass and 3-position low-pass filter sets for each channel.
- Choice of dual output connectors: 5-way binding post plus Neutrik® Speakon®, 5-way binding post plus barrier-strip, or dual Neutrik Speakon.
- 3-speed fan-on-demand.
- Extremely reliable; keeps running under the harshest of conditions.
- Weighs just 33.3 pounds (15.1 kg).

1.2 Unpacking Your Amplifier

Please unpack and inspect your amplifier for any damage that may have occurred during transit. If damage is found, notify the transportation company immediately. Only you can initiate a claim for shipping damage. Crown will be happy to help as needed. Save the shipping carton as evidence of damage for the shipper's inspection.

We also recommend that you save all packing materials so you will have them if you ever need to transport the unit. **Never ship the unit without the factory pack.**

2 How to Use This Manual

This manual provides you with the necessary information to safely and correctly setup and operate your amplifier. It does not cover every aspect of installation, setup or operation that might occur under every condition. For additional information, please consult Crown's *Amplifier Application Guide* (available online at www.crownaudio.com), Crown Tech Support, your system installer or retailer.

We strongly recommend you read all instructions, warnings and cautions contained in this manual. Also, for your protection, please send in your warranty registration card today. And save your bill of sale—it's your official proof of purchase.

3 Setup

3.1 Unpack Your Amplifier

YOU WILL NEED (not supplied):

- Two input wiring cables
- Two output wiring cables
- Rack for mounting amplifier (or a stable surface for stacking)



WARNING: Before you start to set up your amplifier, make sure you read and observe the Important Safety Instructions found at the beginning of this manual.



3.2 Install Your Amplifier

CAUTION: Before you begin, make sure your amplifier is disconnected from the power source, with power switch in the “off” position and all level controls turned completely down (counterclockwise).

Use a standard 19-inch (48.3 cm) equipment rack. See Figure 3.1 for amplifier dimensions.

You may also stack amps without using a cabinet.

NOTE: When transporting, amplifiers should be supported at both front and back.

3.3 Ensure Proper Cooling

When using an equipment rack, mount units directly on top of each other. Close any open spaces in rack with blank panels. DO NOT block front or rear air vents.

Figure 3.2 illustrates standard amplifier airflow.

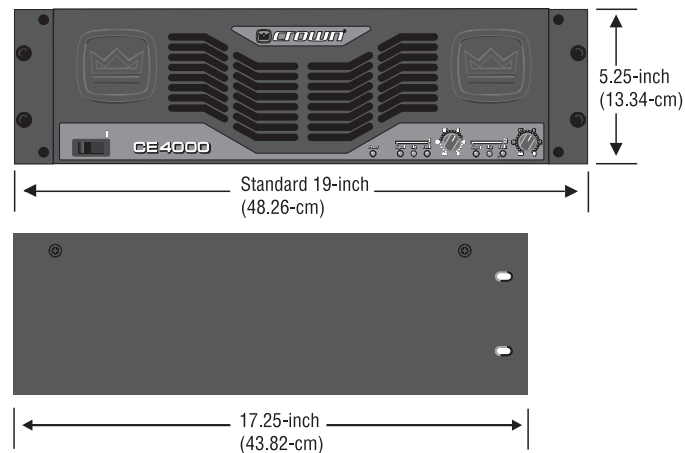


Figure 3.1 Dimensions

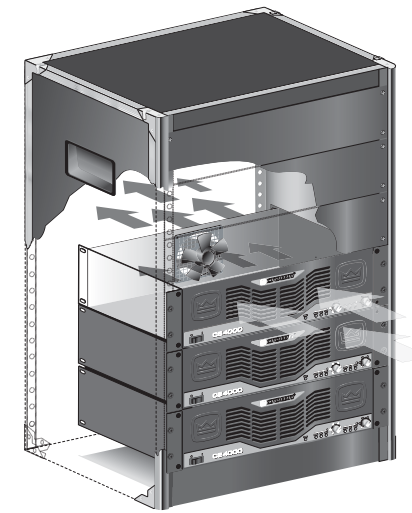


Figure 3.2 Airflow

3 Setup

3.4 Choose Input Wire and Connectors

Crown recommends using pre-built or professionally wired, balanced line (two-conductor plus shield), 22-24 gauge cables and connectors. Depending upon which amplifier input you choose, you should use either 3-pin male XLR connectors, TRS phone connectors, or terminal forks at the amplifier inputs.

Unbalanced line may also be used but may result in noise over long cable runs.

Note: Amplifier input connectors not used for audio signal input may be used for daisy-chaining of the audio signal to other components.

Refer to Figure 3.3 for correct connector pin assignments for balanced wiring, and Figure 3.4 for correct connector pin assignments for unbalanced wiring.



NOTE: Custom wiring should only be performed by qualified personnel.

Balanced Line

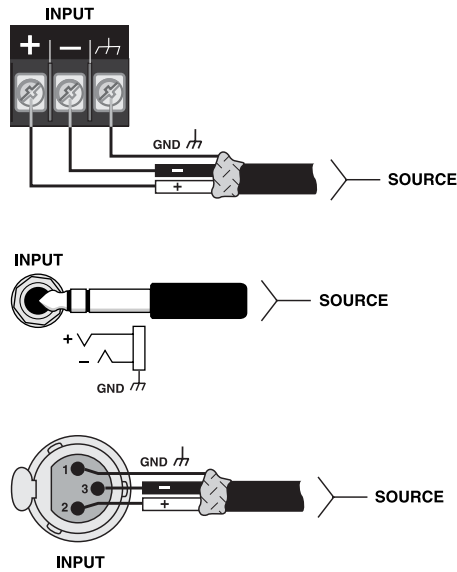


Figure 3.3 Balanced Input Connector Wiring

Unbalanced Line

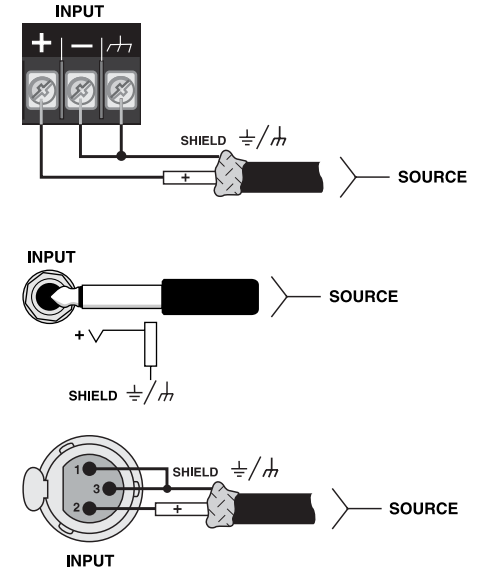


Figure 3.4 Unbalanced Input Connector Wiring

3 Setup

3.5 Choose Output Wire and Connectors

Crown recommends using pre-built or professionally wired, high-quality, two- or four-conductor, heavy gauge speaker wire and connectors. If your amplifier includes Neutrik® Speakon® outputs, use male Speakon NL4C connectors for your output connectors (see Figure 3.5). If your amplifier includes barrier block outputs, you may use spade lugs or bare wire for your output connectors (see Figure 3.6). If your amplifier includes binding post outputs, you may use banana plugs, spade lugs or bare wire for your output connectors (see Figure 3.7). To prevent the possibility of short-circuits, wrap or otherwise insulate exposed loudspeaker cable connectors.

Using the guidelines below, select the appropriate size of wire based on the distance from amplifier to speaker.

Distance	Wire Size
up to 25 ft.	16 gauge
26-40 ft.	14 gauge
41-60 ft.	12 gauge
61-100 ft.	10 gauge
101-150 ft.	8 gauge
151-250 ft.	6 gauge



CAUTION: Never use shielded cable for output wiring.

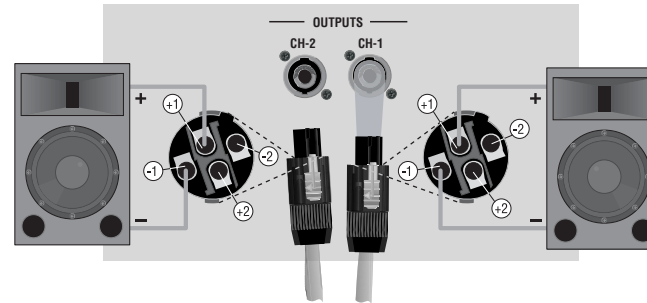


Figure 3.5 Speakon Output Connector Wiring

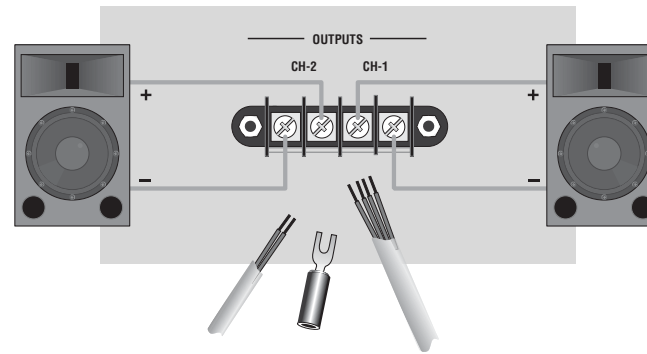


Figure 3.6 Barrier Block Output Connector Wiring

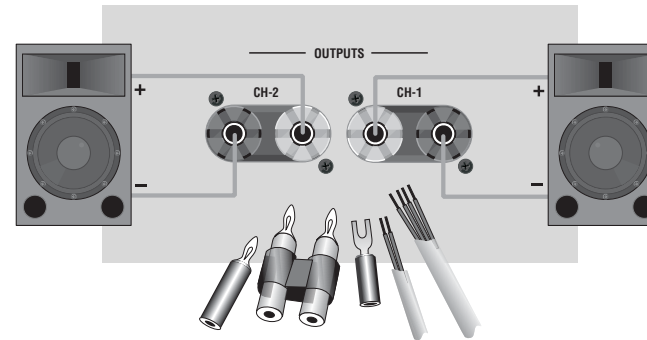


Figure 3.7 Binding Post Output Connector Wiring

3 Setup

3.6 Wire Your System

3.6.1 Stereo Mode

Typical input and output wiring is shown in Figure 3.8.

INPUTS: Connect input wiring for both channels.

OUTPUTS: Maintain proper polarity (+/-) on output connectors.

Connect Channel-1 (+) speaker load to Channel-1 positive terminal of amp; repeat for negative (-). Repeat Channel-2 wiring as for Channel 1. Refer to Section 3.6 for output connector pin assignments. Make sure the Mode switch is set to the "Stereo" position when operating in Stereo mode.

3.6.2 How to Parallel the Inputs

There are three ways to feed the same signal to each amplifier channel:

1. Buy a "Y" cable. Plug the female end into your signal cable, and plug the split male ends into both amplifier inputs.
2. Feed your signal to the Channel-1 input (either barrier-block or combo). Connect a jumper wire (Figure 3.9) between the barrier-block Channel-1 (+) screw terminal and the Channel-2 (+) screw terminal. Connect another jumper wire between the Channel-1 (-) screw terminal and the Channel-2 (-) screw terminal.
3. Feed your signal to the Channel-1 input screw terminals. Using a mic cable or phone-to-phone cable, connect Channel-1 combo jack to Channel-2 combo jack.

3.6.3 Bridge-Mono Mode

Typical input and output wiring is shown in Figure 3.10.

INPUTS: Connect input wiring to Channel 1.

OUTPUTS: Connect the speaker across the positive terminals of each channel. Do not use the negative terminals when the amp is being operated in Bridge-Mono mode. Refer to Section 3.6 for output connector pin assignments. Make sure the Mode switch is set to the "Bridge" position when operating in Bridge-Mono mode.



NOTE: The Channel 2 level control should be set fully counter-clockwise when operating the amplifier in Bridge-Mono mode.

NOTE: Crown provides a reference of wiring pin assignments for commonly used connector types in the *Crown Amplifier Application Guide* (Section 1.21.) available at www.crownaudio.com

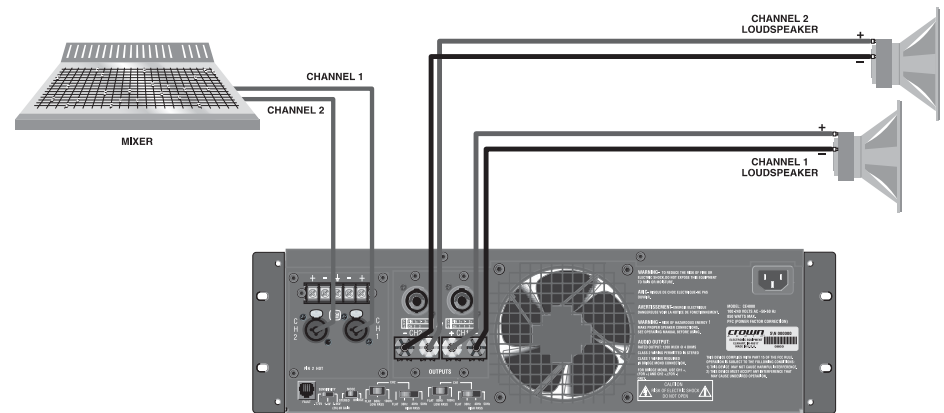


Figure 3.8 System Wiring, Stereo Mode

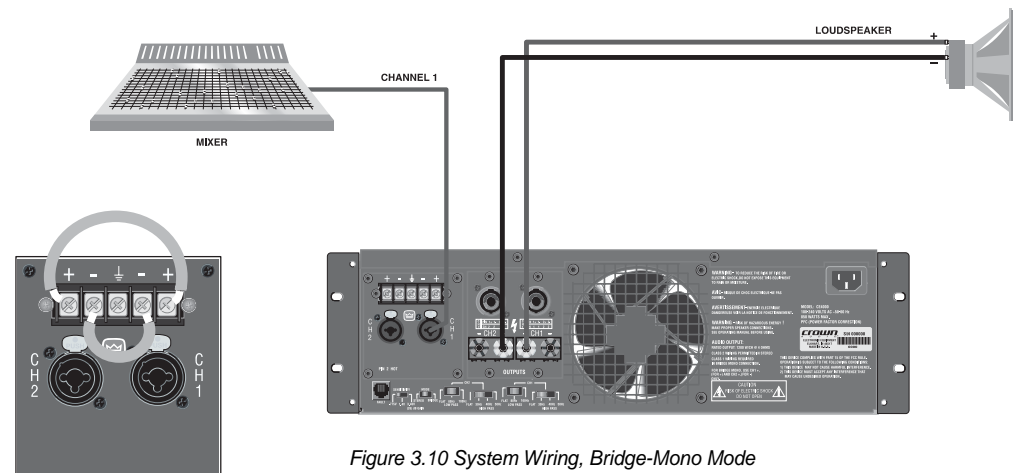


Figure 3.10 System Wiring, Bridge-Mono Mode

Figure 3.9
Jumper Placement to
Parallel the Inputs

3 Setup

3.7 Connect to AC Mains

Connect your amplifier to the AC mains power source (power outlet) with the supplied AC power cordset. First, connect the IEC end of the cordset to the IEC connector on the amplifier; then, plug the other end of the cordset to the AC mains.



WARNING: The third prong of this connector (ground) is an important safety feature. Do not attempt to disable this ground connection by using an adapter or other methods.

Amplifiers don't create energy. The AC mains voltage and current must be sufficient to deliver the power you expect. You must operate your amplifier from an AC mains power source with not more than 10% variation above or below the amplifier's specified line voltage and within the specified frequency requirements (indicated on the amplifier's back panel label). If you are unsure of the output voltage of your AC mains, please consult your electrician.

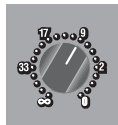
3.8 Startup Procedure

Use the following procedure when first turning on your amplifier:

1. Turn down the level of your audio source.
2. Turn down the level controls of the amplifier.
3. Turn on the "Power" switch. The Power indicator should glow.
4. Turn up the level of your audio source to an optimum level.
5. Turn up the Level controls on the amplifier until the desired loudness or power level is achieved.
6. Turn down the level of your audio source to its normal range.

If you ever need to make any wiring or installation changes, **don't forget to disconnect the power cord.**

For help with determining your system's optimum gain structure (signal levels) please refer to the Crown Amplifier Application Guide, available online at www.crownaudio.com.



4 Operation

4.1 Precautions

Your amplifier is protected from internal and external faults, but you should still take the following precautions for optimum performance and safety:

1. Before use, your amplifier first must be configured for proper operation, including input and output wiring hookup. Improper wiring can result in serious operating difficulties. For information on wiring and configuration, please consult the Setup section of this manual or, for advanced setup techniques, consult Crown's *Amplifier Application Guide* available online at www.crownaudio.com.
2. Use care when making connections, selecting signal sources and controlling the output level. The load you save may be your own!
3. Do not short the ground lead of an output cable to the input signal ground. This may form a ground loop and cause oscillations.

4. **Never connect the output to a power supply, battery or power main. Electrical shock may result.**



5. Tampering with the circuitry, or making unauthorized circuit changes may be hazardous and invalidates all agency listings.
6. **Do not** operate the amplifier with the red Clip LEDs constantly flashing.
7. **Do not** overdrive the mixer, which will cause clipped signal to be sent to the amplifier. Such signals will be reproduced with extreme accuracy, and loud-speaker damage may result.
8. **Do not** operate the amplifier with less than the rated load impedance. Due to the amplifier's output protection, such a configuration may result in premature clipping and speaker damage.

Remember: Crown is not liable for damage that results from overdriving other system components.

4 Operation

4.2 Front Panel Controls and Indicators

A. Power Switch

Amplifier is on when the switch is in the "1" position.

B. Cooling Vents

Front-to-rear forced airflow.

C. Power Indicator

Green LED indicates amplifier has been turned on and AC power is available.

D. Signal Indicator

Green LED illuminates to indicate the presence of signal at the corresponding channel's input. One per channel.

E. Clip Indicator

Red LED illuminates when the channel's output signal is being overdriven. One per channel.

F. Fault Indicator

Red LED illuminates when the corresponding channel is in protect mode. Also illuminates briefly during normal power-up when amplifier is first switched on. One per channel.

G. Level Control

Rotary detented level control, one per channel.

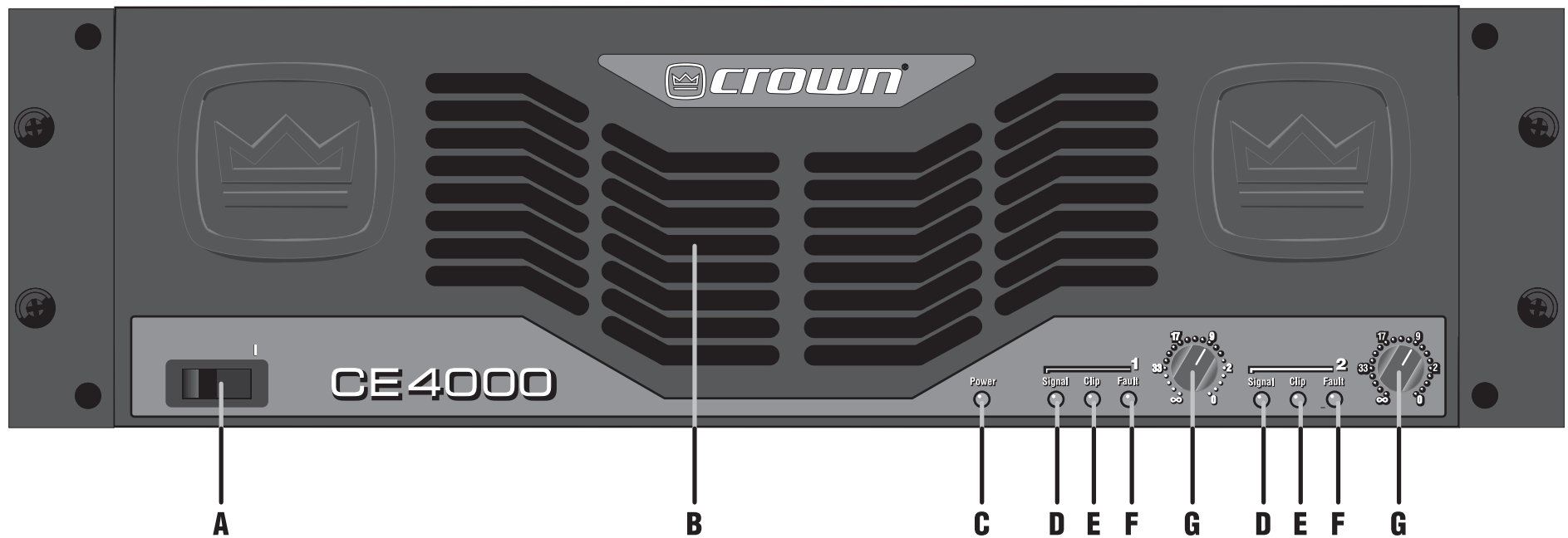


Figure 4.1
Front Panel Controls and Indicators

4 Operation

4.3 Back Panel Controls and Connectors

H. Balanced Barrier Block Inputs (if equipped)

Screw-terminal Barrier Block. One set per channel.

I. Neutrik® Combo Balanced Inputs

Combination three-pin female XLR and TRS. One per channel.

J. Neutrik® Speakon® Outputs (if equipped)

Accept male NL4C connector.

K. 5-Way Binding Post Outputs (if equipped)

Accept banana plugs, spade lugs or bare wire. (European models do not accept banana plugs). One pair per channel

L. IEC Power Connector

M. Fault Connector

Female RJ-45 for connection to external circuit to monitor amplifier Fault status.

N. Sensitivity Switch

Allows selection of .775V, 1.4V or 26-dB sensitivity.

O. Mode Switch

Allows selection of Stereo or Bridge operation.

P. Low-Pass Filter Switch

Allows selection of Flat, 80 Hz or 100 Hz roll-off. One per channel.

Q. High-Pass Filter Switch

Allows selection of Flat, 30 Hz, 40 Hz or 50 Hz roll-off. One per channel.

R. 3-Speed Fan-on-Demand

Provides forced-air cooling of the amplifier.

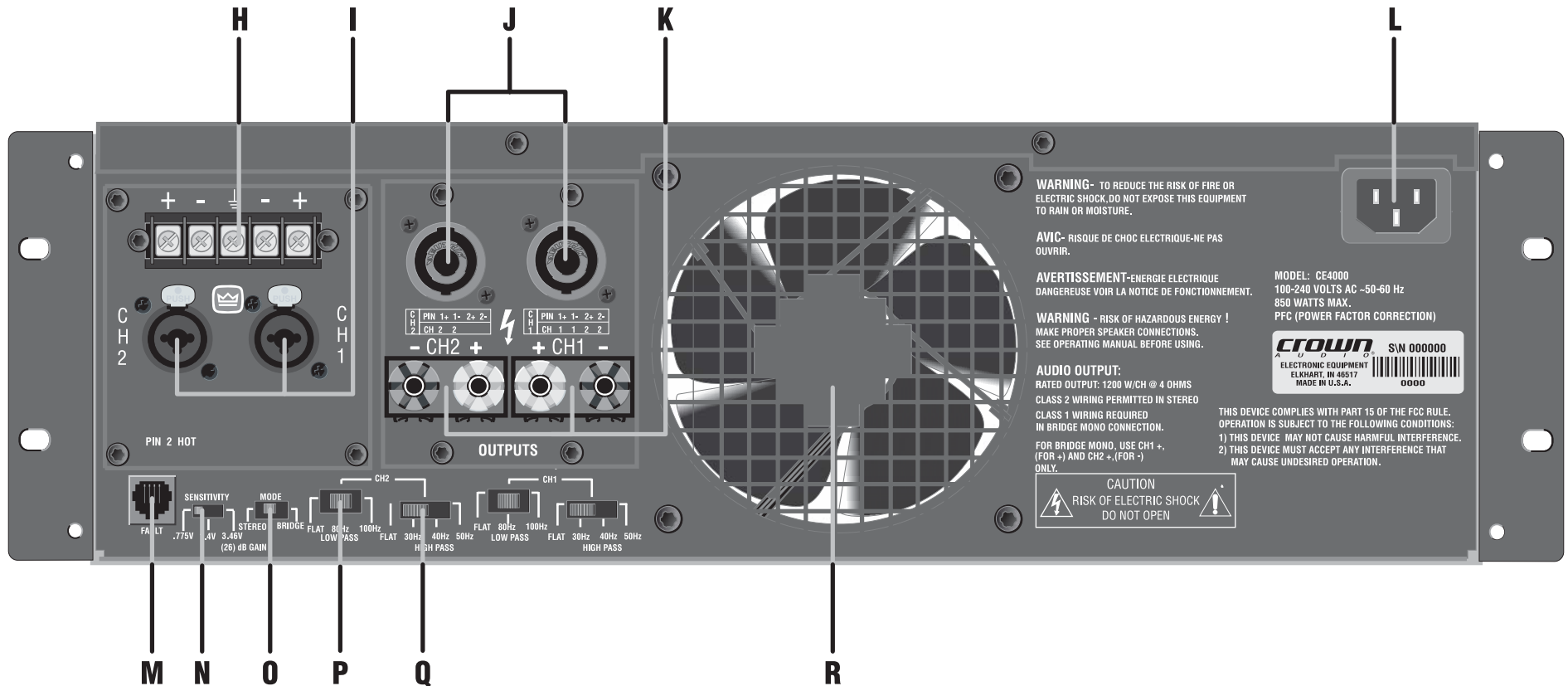


Figure 4.2 Back Panel Controls and Connectors

5 Advanced Features and Options

NOTE: For detailed information about these Crown amplifier features, please consult the Crown *Amplifier Application Guide*, available on the Crown website at www.crownaudio.com.

5.1 Protection Systems

Your Crown amplifier provides extensive protection and diagnostic capabilities, including built-in anti-clip limiters, amplifier fault protection, and switchable high-pass filters.

5.1.1 Anti-Clip Limiters

Your Crown amplifier has built-in Anti-Clip Limiters which offer a degree of protection to your loudspeakers. The Anti-Clip Limiters work by dynamically reducing the amplifier gain if the output stage is driven into clip, thereby reducing potentially damaging distortion to moderate levels.

While some audio systems may already contain protective limiters preceding the amplifier in the system, the amplifier's Anti-Clip Limiters generally will not noticeably affect output quality. For systems without additional protection, the Anti-Clip Limiters can enhance your system's output quality and prevent catastrophic damage to your speakers.

Even with the Anti-Clip Limiters, your amplifier should never be operated at a level which causes the front-panel Clip LEDs to illuminate constantly. While the Anti-Clip Limiters help to prevent damage due to signal distortion, your speakers can still be damaged by excess power dissipation.

5.1.2 Fault

The amplifier will light the Fault LED (Figure 5.1) of an amplifier channel under five different conditions:

1. When the amplifier is first powered up, until the unit is ready for operation.
2. If the heatsinks reach a temperature above normal working limits.
3. If the transformer thermal protection circuit is activated.

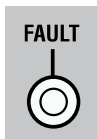


Figure 5.1
Fault Indicator



Figure 5.2
Fault Jack

4. If amplifier output wires develop a short-circuit.
5. Should the amplifier output stage become non-operational.

The Fault status of the amplifier can also be monitored remotely by attaching a signaling device to the Fault jack (see Figure 5.2). For suggestions for external signaling circuits to use, see Section 1.5 of the Crown *Amplifier Application Guide*, available on the Crown website at www.crownaudio.com.

5.1.3 High-Pass Filters

Very low frequency signals contain no useful musical energy, waste valuable amplifier power and headroom, and can be damaging to your speakers. Your Crown amplifier provides switchable high-pass filters to remove these signals from each channel's output.

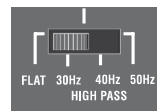


Figure 5.3 High-Pass Filter Switch

For each channel, a back-panel, three-position switch provides optional settings of Flat, 30 Hz, 40 Hz, or 50 Hz (left to right, see Figure 5.3). The 30 Hz setting is suitable for all full-range and low-frequency applications. The lower-frequency settings may be selected when the amplifier is being used to drive a sub-bass program; use only with speakers that provide a useful frequency response below the frequency setting. The FLAT setting provides bypass of the high-pass filters, for use when subsonic protection is provided elsewhere in the system.

5.2 Circuit Designs

5.2.1 BCA

BCA (Balanced Current Amplifier) is Crown's patented, cutting-edge technology that gets more power out of an amplifier with less waste than was ever before possible. A completely new adaptation of standard amplifier design, Crown's BCA "switching" amplifier design provides for high output, exceptional reliability and nearly twice the efficiency of typical amplifier designs.

Crown's BCA "switching" technology is a completely new adaptation of standard switching (PWM) amplifier design. In fact, BCA is differ-

ent enough from other amplifier classes that it received a patent and merits its own class designation, "class-I."

BCA technology offers several key advantages. It provides unprecedented efficiency, requiring less power from the AC supply than other designs, meaning significant cost savings over the life of the amplifier. BCA handles reactive speaker loads easily and gracefully, by reusing energy returned from the speaker rather than dissipating it as heat or forcing the amp into premature current-limiting. This ability makes BCA models extremely resilient—especially at low, 2-ohm impedances. It also makes them more reliable, since they are not constantly stressed to their limits or subjected to excessive heat. Best of all, as proud owners can attest, amps with BCA technology sound great, with a powerful low-end that stands out from the competition.

5.2.2 Switching Power Supply with PFC

Crown's new Switching Power Supply with PFC provides a range of benefits over both non-switching and conventional switching power-supply designs.

Typical non-switching power supplies require large, heavy transformers in order to produce the required power at the output stage. These transformers must be large to absorb the substantial waste that occurs when operating at 50 to 60 Hz (standard AC supplied by the power company).

By contrast, switching power supplies can operate with a much smaller (and lighter) transformer because they first convert the AC up to a much higher frequency, thereby reducing waste.

However, in both non-switching and conventional switching designs, phase differences occur within the power supply due to the inductance of the transformer. This phase difference prevents much of the available power from the AC mains from making its way to the load.

PFC, however, compensates for phase differences in the power supply, allowing more true power to be transferred to the amplifier. The result is more power with less waste than any other conventional switching or non-switching design.

As an added benefit, PFC also allows the amp to be connected to any common AC line voltage, without converting the power supply. This means that whether you're running one or two amps on a household circuit or several amps on a power distro, your CE 4000 amplifier is ready—right out of the box.

5.3 Other Features

5.3.1 Low Pass Filters

For each channel, a back-panel, three-position switch provides optional settings of Flat (Left), 80 Hz (center) and 100 Hz (right) with an 18-dB per octave rolloff (see Figure 5.4). The 80- and 100-Hz settings may be selected when the amplifier is being used to drive a bass program. The FLAT setting provides bypass of the low-pass filters, for use either when a crossover is provided elsewhere in the system, or when the signal is full-range.

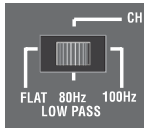


Figure 5.4
Low-Pass Filter Switch

5.3.2 Neutrik Speakon Wiring

The Neutrik Speakon NL4 connector is a four-pole type, which allows either one or two sets of speakers to be wired to one connector. Figure 5.5 shows the wiring pin assignments.

OUTPUT ASSIGNMENT			
PIN	CH	PIN	CH
1+	2	1+	1
1-	2	1-	1
2+		2+	2
2-		2-	2

CH-2	CH-1
------	------

Figure 5.5 Speakon Pin Assignments

5.4 Options

5.4.1 SST Modules

Crown's optional SST (System Solution Topologies) modules were specially designed to improve the fidelity and versatility of your audio system. They feature a variety of professional signal routing and filtering capabilities. Your amplifier may have come with an SST module already factory-installed, or your choice of SST modules can be easily added to the amplifier by any authorized Crown Service Center. For information on available SST modules, visit the Crown website at www.crownaudio.com.

5.4.2 Output Connectors

For added system flexibility, Crown offers optional output connector configurations for your amplifier. If you prefer, you can choose to have dual Neutrik Speakon® output connectors (model CE4E) or 5-way binding post plus barrier strip (model CE4C) connectors installed in your amplifier in place of the standard Neutrik Speakon® plus 5-way binding post outputs (model CE4D) at time of ordering. For information on adding optional output connector modules to an existing CE 4000 amplifier, please contact Crown Technical Support (see Section 8 for contact information).

6 Troubleshooting

— one or more channels —

POWER SIGNAL CLIP FAULT

— one or more channels —

POWER SIGNAL CLIP FAULT

CONDITION: Normal operation.
POSSIBLE REASON:

- This is normal operation for your amp.

— one or more channels —

POWER SIGNAL CLIP FAULT

CONDITION: No power to the amplifier.
POSSIBLE REASON:

- The amplifier's "Power" switch is off.
- The amplifier is not plugged into the power receptacle.
- The amplifier's high-voltage power supply fuse has blown. Return amp to Crown or an authorized Crown Service Center for servicing.

— one or more channels —

POWER SIGNAL CLIP FAULT

CONDITION: Distorted sound.
POSSIBLE REASON:

- Input signal level is too high. Turn down your amplifier level controls. NOTE: Your amplifier should never be operated at a level which causes the Clip LEDs to illuminate constantly.

— one or more channels —

POWER SIGNAL CLIP FAULT

— one or more channels —

POWER SIGNAL CLIP FAULT

— one or more channels —

POWER SIGNAL CLIP FAULT

CONDITION: No sound.
POSSIBLE REASON:

- The amplifier has just been turned on and is still in the 4-second turn-on delay.
- The amplifier is in "fault" mode. A Fault status can be triggered when one of the amplifier's protection circuits is activated. First disconnect your speakers from the affected channel(s) one by one to determine if one of the loads is shorted. If the indicators return to normal status, then try a different speaker or cable to determine where the short is occurring. If no short can be found, turn off the amp and allow the amp to cool. If indicators do not return to normal after restarting your amp, check the fuse and replace if necessary, or return amp to Crown or an authorized Crown Service Center for servicing.

— one or more channels —

POWER SIGNAL CLIP FAULT

- No input signal.
- Input signal level is very low.
- Level controls are turned down.

KEY



7 Specifications

Minimum Guaranteed Power (watts)

Dual Mode, both channels driven

1 kHz with 0.5% THD

2 ohm (per ch.), \geq 200-V line voltage	1,800
2 ohm (per ch.), $<$ 200-V line voltage	1,400
4 ohm (per ch.)	1,200
8 ohm (per ch.)	600

Bridge-Mono Mode

1 kHz with 0.5% THD

4 ohm, \geq 200-V line voltage	3,600
4 ohm, $<$ 200-V line voltage	2,800
8 ohm	2,400

Performance

Frequency Response (at 1 watt, 20Hz - 20kHz) \pm 0.25 dB (see Figure 7.1)

Phase Response (at 1 watt, 20Hz - 20kHz) \pm 15°

Signal to Noise Ratio (A-weighted)
below rated power > 100 dB

Total Harmonic Distortion (THD)
at rated power, from 20 Hz to 20 kHz \leq 0.5%

Intermodulation Distortion (IMD)
60 Hz and 7 kHz at 4:1, from rated power to -30 dB at 8 ohms < 0.5%

Damping Factor (8 ohm) 10Hz to 400Hz > 1000
Note: Measured using binding-post output connectors

Crosstalk (below rated power, 10 kHz) > 50 dB

Common Mode Rejection (CMR, 20 Hz to 1 kHz) > 70 dB

DC Output Offset (shorted input) \pm 10 millivolts

Input Impedance (nominal)
Balanced, unbalanced 20 k ohms, 10 k ohms

Load Impedance
Note: Safe with all types of loads.
Stereo 2-8 ohms
Bridge-Mono 4-8 ohms

Voltage Gain (at rated output)
0.775V sensitivity 39.0 dB
1.4V sensitivity 33.8 dB
3.6V sensitivity 26 dB

7 Specifications

Required AC Mains	50/60 Hz, 100-240VAC ($\pm 10\%$)
AC Line Current	
100 Volts	8.5 A
120 Volts	7.1 A
230-240 Volts	3.7 A
At Idle, amp draws no more than 120 watts	
Construction	
Ventilation	Flow-through ventilation from front to back.
Cooling	3-speed fan-on-demand.
Dimensions	
Width	EIA Standard 19-inch rack mount (EIA RS-310-B);
Height	5.25 inch (13.3 cm)
Depth (behind mounting surface)	16.25 inch (36.6 cm) with additional 1-inch (2.5 cm) rear rack ears
Weight	
Net Weight	33.3 pounds (15.1 kg)
Shipping Weight	39.3 pounds (17.8 kg)

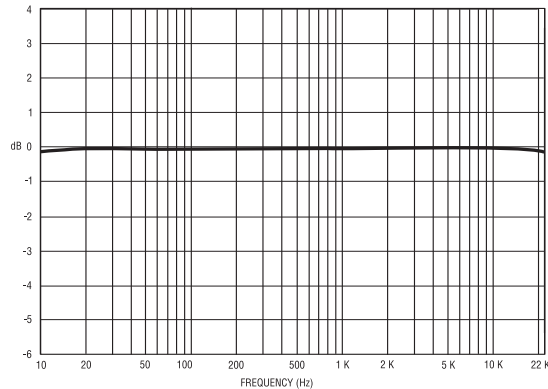


Figure 7.1 Frequency Response

8 Service

Crown amplifiers are quality units that rarely require servicing. Before returning your unit for service, please contact Crown Technical Support to verify the need for servicing.

This unit has very sophisticated circuitry which should only be serviced by a fully trained technician. This is one reason why each unit bears the following label:

CAUTION: To prevent electric shock, do not remove covers. No user serviceable parts inside. Refer servicing to a qualified technician.



Complete the Crown Audio Factory Service Information form, in the back of this manual, when returning a Crown product to the factory or authorized service center. The form must be included with your product inside the box or in a packing slip envelope securely attached to the outside of the shipping carton. Do not send this form separately.

8.1 International and Canada Service

Service may be obtained from an authorized service center. (Contact your local Crown/Amcron representative or our office for a list of authorized service centers.) To obtain service, simply present the bill of sale as proof of purchase along with the defective unit to an authorized service center. They will handle the necessary paperwork and repair.

Remember to transport your unit in the original factory pack.

8.2 US Service

Service may be obtained in one of two ways: from an authorized service center or from the factory. You may choose either. It is important that you have your copy of the bill of sale as your proof of purchase.

8.2.1 Service at a US Service Center

This method usually saves the most time and effort. Simply present your bill of sale along with the defective unit to an authorized service center to obtain service. They will handle the necessary paperwork and repair. Remember to transport the unit in the original factory pack. A list of authorized service centers in your area can be obtained from Crown Factory Service, or online from <http://www.crownaudio.com/support/servcent.htm>.

8.2.2 Factory Service

Crown accepts no responsibility for non-serviceable product that is sent to us for factory repair. It is the owner's responsibility to ensure that their product is serviceable prior to sending it to the factory. Serviceable product list is available at <http://crownweb.crownintl.com/crownrma/>. For more information, please contact us direct.

A Service Return Authorization (SRA) is required for product being sent to the factory for repair. An SRA can be completed online at www.crownaudio.com/support/factserv.htm. If you do not have access to the web, please call Crown's Customer Service at 574.294.8200 or 800.342.6939 extension 8205.

For warranty service, we will pay for ground shipping both ways in the United States. Contact Crown Customer Service to obtain prepaid shipping labels prior to sending the unit. Or, if you prefer, you may prepay the cost of shipping, and Crown will reimburse you. Send copies of the shipping receipts to Crown to receive reimbursement. Your repaired unit will be returned via UPS ground. Please contact us if other arrangements are required.

8.2.3 Factory Service Shipping Instructions:

1. Service Return Authorization (SRA) is required for product being sent to the factory for service. Please complete the SRA by going to www.crownaudio.com/support/factserv.htm. If you do not have access to our website, call 1.800.342.6939, extension 8205 and we'll create the SRA for you.
2. See packing instructions that follow.
3. Ship product to:
CROWN AUDIO FACTORY SERVICE
1718 W MISHAWKA RD.
ELKHART, IN 46517
4. Use a bold black marker and write the SRA number on three sides of the box.
5. Record the SRA number for future reference. The SRA number can be used to check the repair status.

8.2.4 Packing Instructions

Important: These instructions must be followed. If they are not followed, Crown Audio, Inc. assumes no responsibility for damaged goods and/or accessories that are sent with your unit.

1. Fill out and include the Crown Audio Factory Service Information sheet in the back of this manual.
2. Do not ship any accessories (manuals, cords, hardware, etc.) with your unit. These items are not needed to service your product. We will not be responsible for these items.
3. When shipping your Crown product, it is important that it has adequate protection. We recommend you use the original pack material when returning the product for repair. If you do not have the original box, please call Crown at 800.342.6939 or 574.294.8210 and order new pack material. See instructions for "foam-in-place" shipping pack. (Do not ship your unit in a wood or metal cabinet.)
4. If you provide your own shipping pack, the minimum recommended requirements for materials are as follows:
 - a. 275 P.S.I. burst test, Double-Wall carton that allows for 2-inch solid Styrofoam on all six sides of unit or 3 inches of plastic bubble wrap on all six sides of unit.
 - b. Securely seal the package with an adequate carton sealing tape.
 - c. Do not use light boxes or "peanuts". Damage caused by poor packaging will not be covered under warranty.

Using your 'foam-in-place' shipping pack

Note: The foam-in-place packing is molded so that there is only one correct position for your product.

1. Open carton and lift center cushion leaving both end-cushions in place.
2. Carefully place your product with the product's front panel facing the same direction as arrows indicate.

3. Reset center cushion down over top of product's chassis. The foam-in-place packing was molded to accommodate different chassis depth sizes. If your product's chassis does not completely fill the foam-in-place cavity, you may use a soft but solid packing material (such as paper or bubble wrap) behind the chassis.
4. Enclose the completed Crown Audio Factory Service Information form (or securely attach it to the outside of carton) and re-seal the shipping pack with a sturdy carton sealing tape.

8.2.5 Estimate Approval

Approval of estimate must be given within 90 days after being notified by Crown Audio Inc. Units still in the possession of Crown after 90 days of the estimate will become the property of Crown Audio Inc.

8.2.6 Payment of Non-Warranty Repairs

Payment on out-of-warranty repairs must be received within 90 days of the repair date. Units unclaimed after 90 days become the property of Crown Audio Inc.

If you have any questions, please contact Crown Factory Service.

Crown Factory Service

1718 W. Mishawaka Rd.,
Elkhart, Indiana 46517 U.S.A.

Telephone:

574.294.8200

800.342.6939 (North America,
Puerto Rico, and Virgin Islands only)

Facsimile:

574.294.8301 (Technical Support)
574.294.8124 (Factory Service)

Internet:

<http://www.crownaudio.com>

9 Warranty



SUMMARY OF WARRANTY

Crown International, 1718 West Mishawaka Road, Elkhart, Indiana 46517-4095 U.S.A. warrants to you, the ORIGINAL PURCHASER and ANY SUBSEQUENT OWNER of each NEW Crown product, for a period of three (3) years from the date of purchase by the original purchaser (the "warranty period") that the new Crown product is free of defects in materials and workmanship. We further warrant the new Crown product regardless of the reason for failure, except as excluded in this Warranty.

ITEMS EXCLUDED FROM THIS CROWN WARRANTY

This Crown Warranty is in effect only for failure of a new Crown product which occurred within the Warranty Period. It does not cover any product which has been damaged because of any intentional misuse, accident, negligence, or loss which is covered under any of your insurance contracts. This Crown Warranty also does not extend to the new Crown product if the serial number has been defaced, altered, or removed.

WHAT THE WARRANTOR WILL DO

We will remedy any defect, regardless of the reason for failure (except as excluded), by repair, replacement, or refund. We may not elect refund unless you agree, or unless we are unable to provide replacement, and repair is not practical or cannot be timely made. If a refund is elected, then you must make the defective or malfunctioning product available to us free and clear of all liens or other encum-

UNITED STATES & CANADA

brances. The refund will be equal to the actual purchase price, not including interest, insurance, closing costs, and other finance charges less a reasonable depreciation on the product from the date of original purchase. Warranty work can only be performed at our authorized service centers or at the factory. We will remedy the defect and ship the product from the service center or our factory within a reasonable time after receipt of the defective product at our authorized service center or our factory. All expenses in remedying the defect, including surface shipping costs in the United States, will be borne by us. (You must bear the expense of shipping the product between any foreign country and the port of entry in the United States including the return shipment, and all taxes, duties, and other customs fees for such foreign shipments.)

HOW TO OBTAIN WARRANTY SERVICE

You must notify us of your need for warranty service within the warranty period. All components must be shipped in a factory pack, which, if needed, may be obtained from us free of charge. Corrective action will be taken within a reasonable time of the date of receipt of the defective product by us or our authorized service center. If the repairs made by us or our authorized service center are not satisfactory, notify us or our authorized service center immediately.

DISCLAIMER OF CONSEQUENTIAL AND INCIDENTAL DAMAGES

YOU ARE NOT ENTITLED TO RECOVER FROM

US ANY INCIDENTAL DAMAGES RESULTING FROM ANY DEFECT IN THE NEW CROWN PRODUCT. THIS INCLUDES ANY DAMAGE TO ANOTHER PRODUCT OR PRODUCTS RESULTING FROM SUCH A DEFECT. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATIONS OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

WARRANTY ALTERATIONS

No person has the authority to enlarge, amend, or modify this Crown Warranty. This Crown Warranty is not extended by the length of time which you are deprived of the use of the new Crown product. Repairs and replacement parts provided under the terms of this Crown Warranty shall carry only the unexpired portion of this Crown Warranty.

DESIGN CHANGES

We reserve the right to change the design of any product from time to time without notice and with no obligation to make corresponding changes in products previously manufactured.

LEGAL REMEDIES OF PURCHASER

THIS CROWN WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE. No action to enforce this Crown Warranty shall be commenced after expiration of the warranty period.

THIS STATEMENT OF WARRANTY SUPERSEDES ANY OTHERS CONTAINED IN THIS MANUAL FOR CROWN PRODUCTS. 12/01

9 Warranty



WORLDWIDE EXCEPT USA & CANADA

SUMMARY OF WARRANTY

Crown International, 1718 West Mishawaka Road, Elkhart, Indiana 46517-4095 U.S.A. warrants to you, the ORIGINAL PURCHASER and ANY SUBSEQUENT OWNER of each NEW Crown¹ product, for a period of three (3) years from the date of purchase by the original purchaser (the "warranty period") that the new Crown product is free of defects in materials and workmanship, and we further warrant the new Crown product regardless of the reason for failure, except as excluded in this Warranty.

¹ **Note:** If your unit bears the name "Amcron," please substitute it for the name "Crown" in this warranty.

ITEMS EXCLUDED FROM THIS CROWN WARRANTY

This Crown Warranty is in effect only for failure of a new Crown product which occurred within the Warranty Period. It does not cover any product which has been damaged because of any intentional misuse, accident, negligence, or loss which is covered under any of your insurance contracts. This Crown Warranty also does not extend to the new Crown product if the serial number has been defaced, altered, or removed.

WHAT THE WARRANTOR WILL DO

We will remedy any defect, regardless of the reason for failure (except as excluded),

by repair, replacement, or refund. We may not elect refund unless you agree, or unless we are unable to provide replacement, and repair is not practical or cannot be timely made. If a refund is elected, then you must make the defective or malfunctioning product available to us free and clear of all liens or other encumbrances. The refund will be equal to the actual purchase price, not including interest, insurance, closing costs, and other finance charges less a reasonable depreciation on the product from the date of original purchase. Warranty work can only be performed at our authorized service centers. We will remedy the defect and ship the product from the service center within a reasonable time after receipt of the defective product at our authorized service center.

HOW TO OBTAIN WARRANTY SERVICE

You must notify your local Crown importer of your need for warranty service within the warranty period. All components must be shipped in the original box. Corrective action will be taken within a reasonable time of the date of receipt of the defective product by our authorized service center. If the repairs made by our authorized service center are not satisfactory, notify our authorized service center immediately.

DISCLAIMER OF CONSEQUENTIAL AND INCIDENTAL DAMAGES

YOU ARE NOT ENTITLED TO RECOVER FROM US ANY INCIDENTAL DAMAGES RESULTING FROM ANY DEFECT IN THE NEW CROWN PRODUCT. THIS INCLUDES ANY DAMAGE TO ANOTHER PRODUCT OR PRODUCTS RESULTING FROM SUCH A DEFECT.

WARRANTY ALTERATIONS

No person has the authority to enlarge, amend, or modify this Crown Warranty. This Crown Warranty is not extended by the length of time which you are deprived of the use of the new Crown product. Repairs and replacement parts provided under the terms of this Crown Warranty shall carry only the unexpired portion of this Crown Warranty.

DESIGN CHANGES

We reserve the right to change the design of any product from time to time without notice and with no obligation to make corresponding changes in products previously manufactured.

LEGAL REMEDIES OF PURCHASER

No action to enforce this Crown Warranty shall be commenced after expiration of the warranty period.

THIS STATEMENT OF WARRANTY SUPERSEDES ANY OTHERS CONTAINED IN THIS MANUAL FOR CROWN PRODUCTS. 7/01



Crown Audio Factory Service Information

Shipping Address: Crown Audio Factory Service, 1718 W. Mishawaka Rd., Elkhart, IN 46517

PLEASE PRINT CLEARLY

SRA #: _____ (If sending product to Crown factory service.) Model: _____ Serial Number: _____ Purchase Date: _____

PRODUCT RETURN INFORMATION

Individual or Business Name: _____

Phone #: _____ Fax #: _____ E-Mail: _____

Street Address (please, no P.O. Boxes): _____

City: _____ State/Prov: _____ Postal Code: _____ Country: _____

Nature of problem: _____

Other equipment in your system: _____

If warranty is expired, please provide method of payment. Proof of purchase may be required to validate warranty.

PAYMENT OPTIONS

I have open account payment terms. Purchase order required. PO#: _____ COD

Credit Card (Information below is required; however if you do not want to provide this information at this time, we will contact you when your unit is repaired for the information.)

Credit card information:

Type of credit card: MasterCard Visa American Express Discover

Type of credit card account: Personal/Consumer Business/Corporate

Card # _____ Exp. date: _____ * Card ID #: _____

* Card ID # is located on the back of the card following the credit card #, in the signature area. On American Express, it may be located on the front of the card. This number is required to process the charge to your account. If you do not want to provide it at this time, we will call you to obtain this number when the repair of your unit is complete.

Name on credit card: _____

Billing address of credit card: _____

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NOTES



H A Harman International Company