



## **Elite 1K8/2K5**

### **Professional Power Amplifiers**



# **User's Manual**

(BOM Ref.: 24-004-1793)

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## 1 Explanation Of Graphical Symbols

This manual does not include all of the details of design, production, or variations of the equipment. Nor does it cover every situation which may arise during installation, operation or maintenance. The information provided in this manual was deemed accurate as of the publication date.

### WATCH FOR THESE SYMBOLS:



The lightning flash triangle is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point triangle is intended to alert the user of the presence of important operation and maintenance (servicing) instructions in the literature accompanying the product.



**CAUTION:** To reduce the risk of electric shock, do not remove cover. No user-serviceable parts inside. Refer servicing to qualified service personnel.

**WARNING:** To prevent electrical shock or fire hazard, do not expose this appliance to rain or moisture. Before using this appliance, read the operation guide for further warnings.



### Magnetic Field

**CAUTION:** Do not locate sensitive high-gain equipment such as pre-amplifiers 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 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 pre-amplifier or other sensitive equipment at the top.



## 2 Important Safety Instruction

**WARNING:** When using electric products, basic caution should always be followed, including the following:

1. Read safety and operating instruction before using this product.
2. All safety and operating instruction before using product.
3. Obey all cautions in the operation instructions and on the back of the unit.
4. All operation instruction should be followed.
5. This product should not be used near water (i.e. bathtub, sink, swimming pool, wet basement, etc.)
6. This product should not be located so that its position does not interfere with its proper ventilation. It should not be placed flat against a wall or placed in a built-in enclosure that will impede the flow of cooling air.
7. This product should not be placed near a source of heat such as a stove, radiator, or another heat production amplifier.
8. Connect only to a power supply of the type marked on the unit adjacent to the power supply cord.
9. Never break off the ground pin on the power supply cord. For more information on grounding, write for our free booklet "Shock Hazard and Grounding."
10. Power supply cords should always be handled carefully. Never walk on or place equipment on power supply cords. Periodically check cords for cuts or signs of stress, especially at the plug and the point where the cord exits the unit.
11. The power supply cord should be unplugged when the unit is to be unused for long periods of time.
12. If this product is to be mounted in an equipment rack, rear support should be provided.
13. Metal part can be cleaned with a damp rag. The vinyl covering used on some units can be cleaned with a damp rag or an ammonia-based household cleaner if necessary. Disconnect unit from power supply before cleaning.
14. Care should be taken so that objects do not fall and liquids are not spilled into the unit through the ventilation holes or any other openings.



15. This unit should be checked by a qualified service technician if :

- a)The power supply cord or plug has been damaged.
- b)Anything has fallen or been spilled into the unit.
- C)The unit does not operate correctly.
- D)The unit has been dropped or the enclosure damaged.

16. The user should not attempt to service this equipment. All service work should be done by a qualified service technician.

17. This product should be used only with a cart or stand that is recommended by us.

18. Exposure to extremely high noise levels may cause a permanent hearing loss. Individuals vary considerably in susceptibility to noise induced hearing loss, but nearly everyone will lose some hearing if exposed to sufficiently intense noise for a sufficient time. The U.S. Government's Occupational Safety and Health Administration (OSHA) has specified the following permissible noise level exposures.

| Duration Per Day In Hours | Sound Level dBA, Slow Response |
|---------------------------|--------------------------------|
| 8                         | 90                             |
| 6                         | 92                             |
| 4                         | 95                             |
| 3                         | 97                             |
| 2                         | 100                            |
| 1½                        | 102                            |
| 1                         | 105                            |
| ½                         | 110                            |
| ¼ or less                 | 115                            |

According to OSHA, any exposure in excess of the above permissible limits could result in some hearing loss. Ear plugs or protectors for the ear canals or over the ears must be worn when operating this amplification system in order to prevent a permanent hearing loss if exposure is in excess of the limits as set forth above. To ensure against potentially dangerous exposure to high sound pressure levels, it is recommended that all persons exposed to equipment capable of producing high sound pressure levels such as amplification system be protected by hearing protectors while this unit is in operation.



### 3 Welcome

Congratulations on purchasing one of the ELITE Series professional stereo power amplifiers from WARRIOR. The ELITE Series of power amplifiers represent a new era in affordable, tried-and-true, quality power amplification. The Series comprises two models: the 1K8, and the 2K5. They are designed to provide enormous levels of pure, undistorted power in a rugged, robust chassis - making them the choice for pro sound reinforcement.

This manual provided you with the necessary information to safely and correctly set up and operate your amplifier. Please take the time to read all instructions, warning and cautions contained in this manual so that you can obtain the best possible service from your amplifier.

#### 3.1 Unpacking

Please unpack and inspect the amplifier for any damage that may occur during shipment. If any damage is found, notify your dealer immediately. Be sure to save the carton and all packing materials. Should you ever need to ship the unit back to one of our Distributors, one of its service centers, or the dealer, use only the original factory packing.

#### 3.2 Introduction

The ELITE amplifier features a 2-way crossover and sub-low (low-cut) filter for each channel. Crossover frequencies are fixed at 150Hz, allowing subwoofers to be driven at extremely high sound pressure levels, and the filters cut at 40Hz to prevent low-end rumble. Using proven technology gained through years of amplifier design, this unit takes advantage of rugged TO-3P output devices mounted on massive aluminum extrusions and dissipates heat via an extremely quiet and effective 2-speed fan. ELITE amplifiers employ mammoth toroidal power transformers and offer impressive specifications and features not found on similarly priced competitive units. This amplifier is designed to drive a 2-ohm load per channel, thus achieving awesome performance levels into 4 ohm in BRIDGE mode. ELITE amplifiers are ruggedly constructed, rack-mountable pieces of gear with superb patching capability, allow superior flexibility in application. Front panel features include calibrated, detented gain (dB) controls and LED indicators for power (PWR), signal presence (SIG), and soft clipping (Distortion indication) activation on each channel, as well as a rocker mains POWER switch. The back of panel contains an IEC connector for the mains power cord, a main circuit breaker with reset, and the critical cooling fan opening. This opening should have an adequate supply of cool air and should never be blocked.

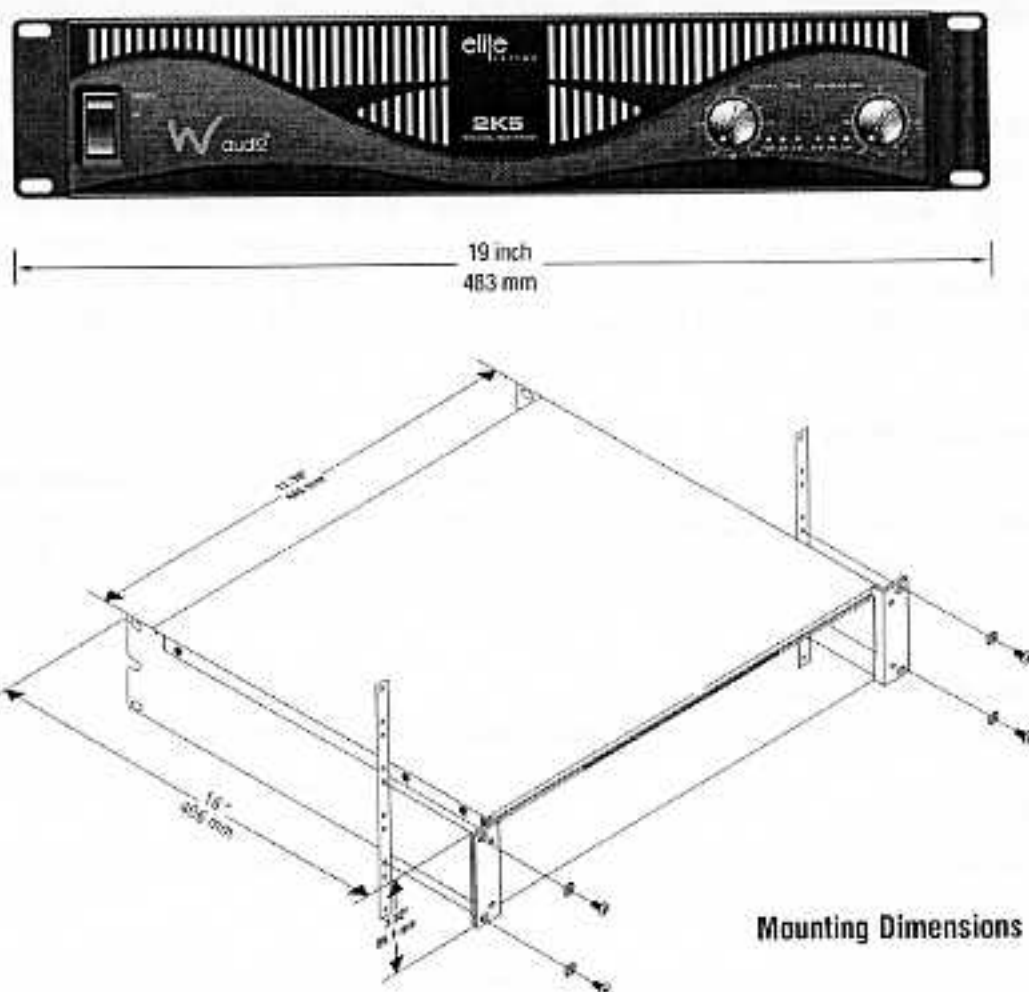
or restricted. Also on the back of panel is the input and output sections, including an input barrier strip for permanent installations. Each channel input section includes a XLR connector, THRU/LOW and HI PASS out 1/4" jacks, and the activation switches for the LOW BANDPASS filter and crossover (150Hz Xover). Channel output sections feature dual shock-proof binding posts and four-conductor Speakon connectors, as well as BRIDGE mode output.

## 4 Installation

### 4.1 Mounting

ELITE professional power amplifiers are designed for standard 19 inch (483 mm) rack mounting and stack mounting without a cabinet. They are two-rack-space units of 16" (406mm) depth designed to mount in a standard 19" rack. Rear mounting ears are provided for additional support. The minimum rack depth required from the mounting surface is 17" (432mm) to allow adequate connector clearance.

You may also stack amplifier without using a rack cabinet.



## 4.2 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, rear or side air vents. The side walls of the rack should be a minimum of two inches (5.1 mm) away from the amplifier sides, and the back of rack should be a minimum of four inches (10.2 mm) from the amplifier back panel.

## 5 Controls And Facilities

### 5.1 Front Panel Facilities



#### (1) GAIN CONTROLS(dB)

These controls are used to adjust the input gain of each channel. They determine how "loud" each channel of the power amplifier will sound for a given input signal level. Maximum input gain is achieved at the fully clockwise setting (+34dB, 50x), and this setting yields maximum mixer / system headroom. A setting of less than fully clockwise will yield lower system noise at the expense of mixer/ system headroom. Turning the control fully counterclockwise is the "off" setting (-x). It is always a good idea to power up any new installation at this setting to protect the system loudspeakers.

#### (2) POWER LEDS (PWR)

These indicators illuminate when the AC mains power is being supplied to the amp and both channels are operational. If either channel experiences fault conditions, exceeds safe operation temperature limits, or if the mains circuit breaker trips; both channel power LEDs will be off, indicating "shutdown". If the BRIDGE mode is selected, the PWR indicator on the channel 1 will be remained off as a positive indication of this mode selection.

#### (3) SIGNAL ACTIVITY LEDS (SIG)

These indicators illuminate when the associated channel output signal level exceeds 1V RMS.

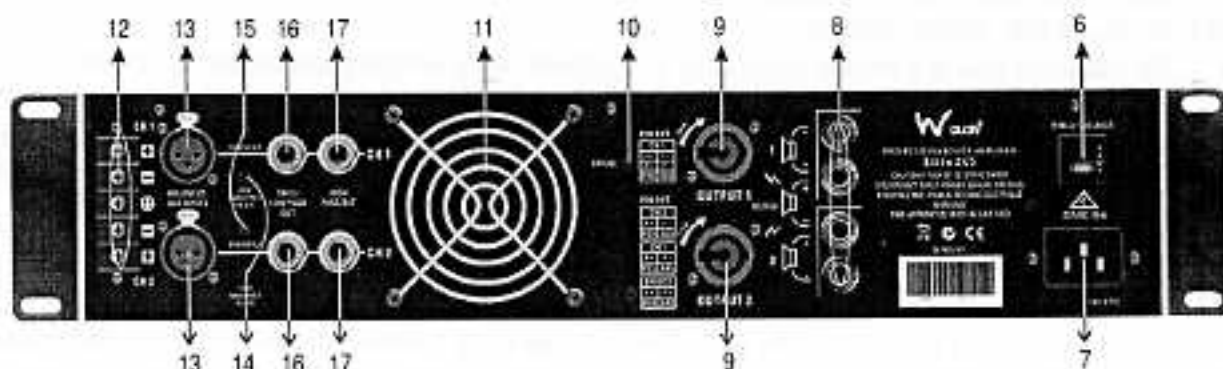
#### (4) CLIP LEDS

Two red indicators, one for each channel, illuminate when the channel's output signal is being overdriven.

#### (5) POWER SWITCH

This heavy-duty, rocker-type switch turns on the main power to the amplifier. When the mains power is applied, there is a 2 second delay in activation of the unit. This reduces/ eliminates the turn-on transients associated with the system equipment connected to the amplifier and protects loudspeakers.

## 5.2 Back Panel Facilities



### (6) CIRCUIT BREAKER

There is one circuit BREAKER on the ELITE amplifier. This breaker is provided to limit current to the associated power transformer, and protect it from overheating and possible destruction due to the fault conditions in the unit. The trip current values has been carefully chosen to allow reasonable continuous power output performance, while still protecting the power transformer. This breaker should not be tripped unless there is a fault in the amplifier circuitry that causes excessive mains current draw. However, abnormal conditions such as a short circuit on either or both channels, or continuous operation at overload or clipping (especially into 2-ohm loads per channel or 4-ohm bridge mode) can cause the breaker to trip. If this occurs, turn the POWER switch OFF and reset the breaker, after waiting a brief period of time to allow the unit to cool down. Efforts should be made to correct the cause of the overload if possible. When tripped, the button on the BREAKER will be outward approximately 1/4" and can be reset by pushing inward and upward. A normal reset button is relatively flat. If the breaker trips instantly each time you attempt to turn the unit on, it should be taken to a qualified Service Center from our Distributor for repair.

### (7) IEC MAINS CONNECTOR

This is a standard IEC power connector. An AC mains cord having the appropriate AC plug and ratings for the intended operating voltage is included in the carton.

#### U.S. Domestic AC Mains Cord.

The mains cord supplied with the unit is a heavy-duty, 3 conductor type with a conventional 120 VAC plug with ground pin. It should be connected to an independent circuit capable of continuously supporting at least 15 amps. This is particularly critical for sustained high-power applications. If the outlet used does not have a ground pin, a suitable grounding adapter should be used and the third wire grounded properly.

**Never break off the ground pin on any equipment. It is provided for your safety.**

The use of extension cords should be avoided but, if necessary, always use a 3-wire type with at least a #14 AWG wire size. The use of lighter wire will severely limit the power capability of this amplifier. Always use a qualified electrician to install any new electrical equipment. To prevent the risk of shock or fire hazard, always be sure that the amplifier and all associated equipment is properly grounded.

**NOTE: FOR UK ONLY**

If the colors of the wires in the mains lead of this unit do not correspond with the colored markings identifying the terminals in your plug, proceed as follows:

- The wire that is colored green and yellow must be connected to the terminal that is marked by the letter E, the earth symbol, colored green, or colored green and yellow.
- The wire that is colored blue must be connected to the terminal that is marked with the letter N or the color black.
- The wire that is colored brown must be connected to the terminal that is marked with the letter L or the color red.

**(8) BINDING POST OUTPUTS**

Shockproof binding post speaker outputs are provided on the ELITE amplifier. For each channel, the outputs are in parallel and the speaker connection cables can be terminated with banana plugs or stripped wire for use in the binding post terminals, or can be connected using Speakon outputs (9). For sustained high-power application, either outputs can be used; however, exercise care to assure the correct speaker phasing. The red binding posts are the signal outputs from each channel, and the black binding posts are chassis ground. The red binding post should be connected to the positive inputs of the associated loudspeakers. For BRIDGE mode operation, only the red binding posts are used and the associated loudspeaker load is connected between the two red posts.

**WARNING...** Regardless of what connections are used, the minimum parallel speaker load should always be limited to 2 ohms per channel or 4 ohms BRIDGE mode for any application. Operation at loads of 4 ohms per channel, or 8 ohms BRIDGE, is more desirable for sustained operation applications because the amplifier will run much cooler at this loading. Operation above 4 ohms per channel and even open-circuit conditions can always be considered safe, but sustained operation at the loads below 2 ohms could result in temporary amplifier shut down due to the thermal limit circuitry.

**(9) SPEAKON OUTPUTS**

There are two Neutrik NL4MD Speakon jacks on the rear panel. The Speakon connector is designed specially for high-power speaker connections. It locks in place, prevents shock hazard, and assures the correct polarity. The bottom Speakon jack has both Channel 1 and Channel 2 outputs, so it is especially useful for parallel, bi-amp, or bridged mono operation. The upper Speakon carries only the Channel 1 output.

**(10) MODE SWITCH**

This switch is used to select STEREO or BRIDGE mode operation. It is a conventional push-push type, requiring the use of a small pen tip. The "IN" position is BRIDGE mode; the "OUT" position is STEREO mode. Accidental selection of BRIDGE mode could damage loudspeakers, particularly in bi-amped systems.

**(11) FAN GRILL**

A 2-speed DC fan supplies cool air to the amplifier. **THIS INTAKE SHOULD NEVER BE BLOCKED!** The fan switches to high speed automatically when the unit requires additional cooling. At idle and cool, the fan should be in low speed. The fan should never stop unless the amplifier is switched off or the AC mains power source is interrupted.

## (12) INPUT BARRIER STRIP

A barrier strip is provided for input connections using bare wire or spade lug connections. ELITE amplifier employ FET low-noise, electronically balanced input circuitry. This circuitry offers a very wide dynamic range capable of handling virtually any input signal level, while providing excellent common mode rejection to minimize hum and reduce interference. This strip accepts balanced and unbalanced audio signals. The "+" and "-" terminals are the positive and negative inputs to the responsive channels. The GND terminal is the common ground to both channel inputs. For use with an unbalanced source, connect the "-" input terminal of the channel to ground with a jumper. If the "-" input is left floating, a 6 dB loss in channel gain will result and the floating input terminal may pick up outside noise to affect the unit's performance.

## (13) XLR INPUT CONNECTOR

The connector offers XLR balanced input for each channel. The XLR is wired with pin 1 as ground, pin 2 positive input and pin 3 negative input. It is very important to realize that the XLR and barrier strip are all in parallel; therefore, a balanced input to the associated channel can be accomplished using a male XLR or bare wires connected to the barrier strip.

## (14) LOW PASS FILTER SWITCH

This switch is used to activate the LOW PASS FILTER for the corresponding channel. It is again a push-push type switch, requiring a small pen tip to activate. The "PUSHED" position routes the input signals through the 40Hz LOW cut filter, while the "OUT" position bypasses the filter. This filter will cut extremely low frequencies, protecting speakers from the possibility of over-excitation. The filter low-frequency roll off is 12 dB per octave. **The LOW PASS FILTER** for each channel will function independently of the crossover function to be discussed next.

## (15) CROSSOVER SWITCH (150Hz XOVER)

This switch is used to activate the 150Hz crossover for the corresponding channel. It is also a push-push type switch and requires a small pen tip to activate. The ELITE series offer two independent 150Hz crossovers. These are specially designed features that enhance the response of most loudspeakers in a typical bi-amped application. Rather than just having a flat output curve, these crossovers use special filters to tailor the response provide a flat acoustical outputs. This type of crossover "sounds" more natural than conventional "state-variable" type crossovers.

With the switch "PUSHED", the input signals are routed through the crossover, and **the low frequencies are automatically sent to the corresponding channel**. At the same time, the high frequencies are sent to the **HIGH PASS OUT** (17) jack and **must** then be patched to INPUT of the other channel of this amplifier or to another amplifier input to complete the bi-amped system. Additionally, the low frequencies are sent to **THRU/LOW BANDPASS OUT** (16) jack, and can be patched to other amplifier inputs to permit even larger system. With the switch "OUT" the crossover is defeated, and the input signals is routed directly to the respective power amp channel. The crossover frequency is fixed at 150Hz and cannot be changed. The crossover configuration is a 4-pole Linkwitz-Riley approximation.

**(16) THRU/LOW PASS OUT JACK**

As per previous crossover discussion, the 1/4" jack supplies unbalance low-frequency out signal from activated crossover for patching to additional power amplifier input, providing added flexibility in the larger bi-amped systems. When the crossover function is not activated, this jack converts to a THRU function, where the output of the electronically balanced input circuitry is supplied to this jack. The THRU function provides the means to **patch a full range input signal to the other input of this amplifier (parallel mode)**, or to other amp inputs in the same rack. This function allows one balanced mixer feed to be connected to the amp via the desired balanced input connector (XLR or Barrier), and then further distributed locally. Regardless of the crossover switch position, this 1/4" jack provides an unbalanced (tip/sleeve) output to be patched with single conductor shielded cables.

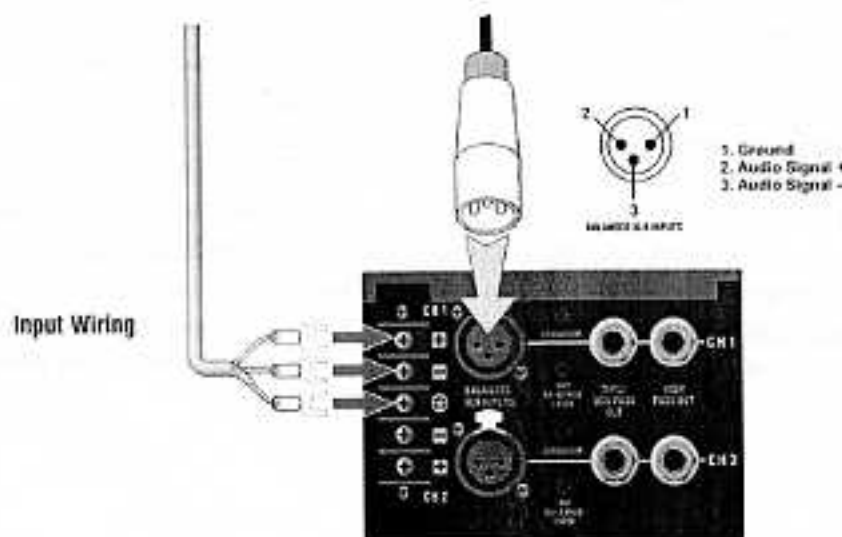
**(17) HIGH PASS OUT JACK**

Again, as per previous crossover discussion, this 1/4" jack supplies high frequency out signal from the activated crossover for patching to this amplifier and/or additional power amplifier inputs. Unlike the low-frequency crossover output, that is automatically routed to the associated channel, **the high-frequency output signal must be patched to some suitable input in order to complete the bi-amped system**. This 1/4" jack also provides an unbalanced (tip/sleeve) output to be patched with single-conductor shielded cables.

**6 Setup****6.1 Input Connection**

This ELITE amplifier provides both XLR jacks and a barrier strip for input connection. A barrier strip allows you to use bare wire or spade lugs for input wiring. We recommend using pre-built or professionally wired balanced line (two-conductor plus shield), 22-24 gauge cables. Regarding XLR connection, this unit accepts 3-pin male XLR connectors on the audio source end.

For two-channel(stereo) operation, use the inputs for both Channel 1 and Channel 2.  
For bridged mono operation, use the Channel 2 only.



## 6.2 Output Connection

This ELITE amplifier offers a choice of output connections, with two Neutrik NL4MD Speakon jacks and two pairs of shockproof binding posts.

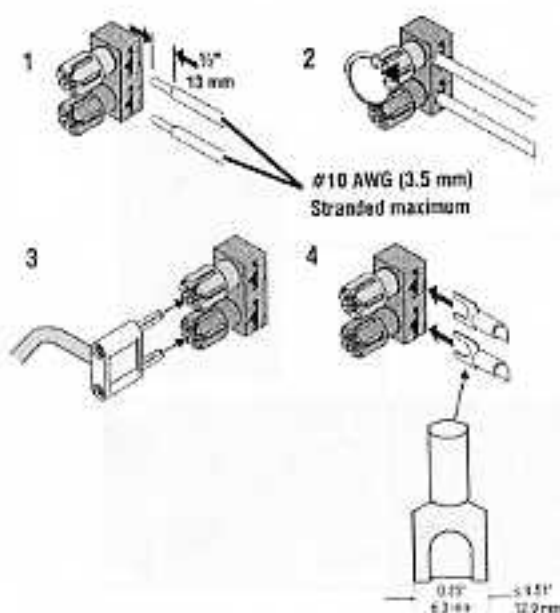
The Speakon connector is designed specially for high-power speaker connections. It locks in place, prevents shock hazard, and assures the correct polarity.



Left: One of the two Speakon output connectors on back panel

Right: Speakon cable connector

In the binding post terminals, the red binding posts are the signal outputs from each channel, and the black binding posts are the chassis ground. The red binding post should be connected to the positive inputs of the associated loudspeakers.



**WARNING:** To prevent electric shock, do not operate the amplifier with any of the conductor portion of the speaker wire exposed.

### 6.3 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 male connector on the amplifier, then plug the other end of the cordset to the AC mains. Make sure you connect the amplifier to the correct AC line voltage, which is indicated on the amplifier's back panel. Connecting to the wrong line voltage is dangerous and may damage the amplifier.

### 6.4 Stereo Mode Connection

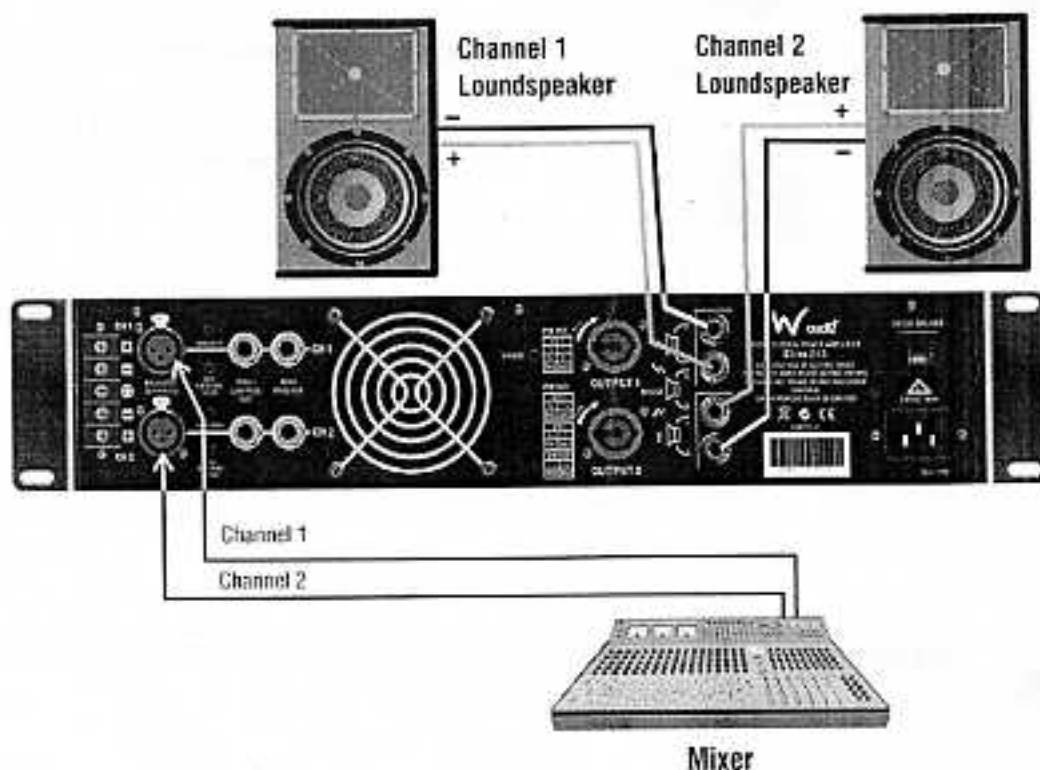
Set the back panel Stereo/Bridge Mode Switch to Stereo (Push the switch to "OUT" position).

**Inputs:** Connect input wiring to both channel 1 and channel 2.

**Outputs:** Observe correct loudspeaker polarity and be very careful to maintain proper polarity (+/-) on output connectors. Connect Channel 1 loudspeaker's positive(+) lead to Channel 1 positive terminal of amplifier; repeat for negative(-). Repeat Channel 2 wiring as for Channel 1.

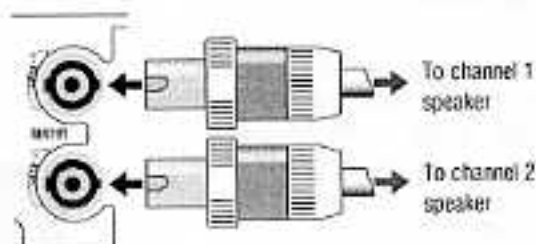
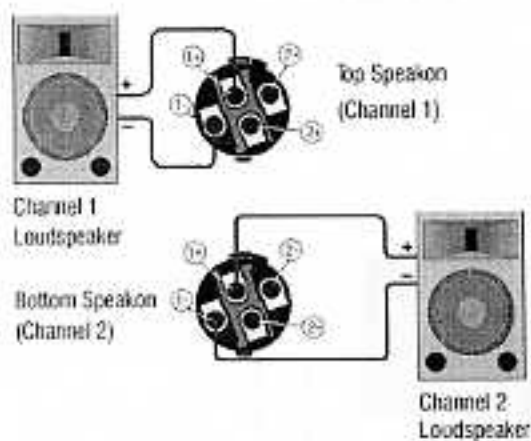
#### Stereo Wiring Method 1:

Wire stereo speakers (two channels) to two pairs of binding posts.

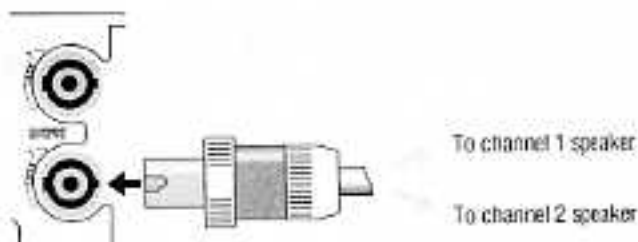
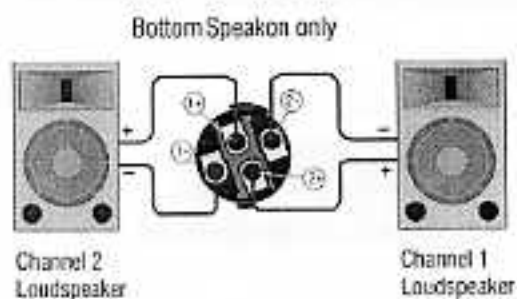


### Stereo Wiring Method 2:

A. Use two separate Speakon Connector to connect two speakers respectively.



B. Use only the bottom Speakon Connector to connect two speakers.



### 6.5 Bridge-Mono Mode Connection

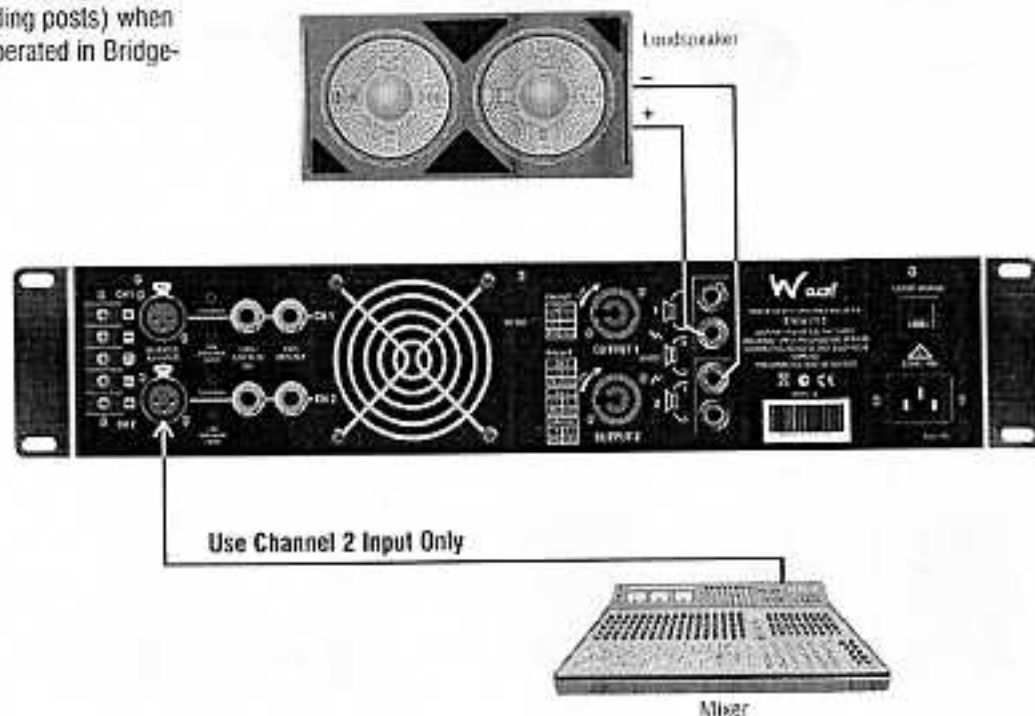
Set the back panel Stereo/Bridge Mode Switch to Bridge (Push the switch to "IN" position).

**Inputs:** Connect input wiring to CHANNEL 2 ONLY.

**Outputs:** There are two ways to wire the amplifier output connectors for Bridge-Mono Mode.

#### Wiring Method 1:

Wire the speaker across the positive terminal (red binding posts) of each channel. Do not use the negative terminal (black binding posts) when the amp is being operated in Bridge-Mono Mode.



#### Wiring Method 2:

Wire the speaker only to the bottom Speaker connector.



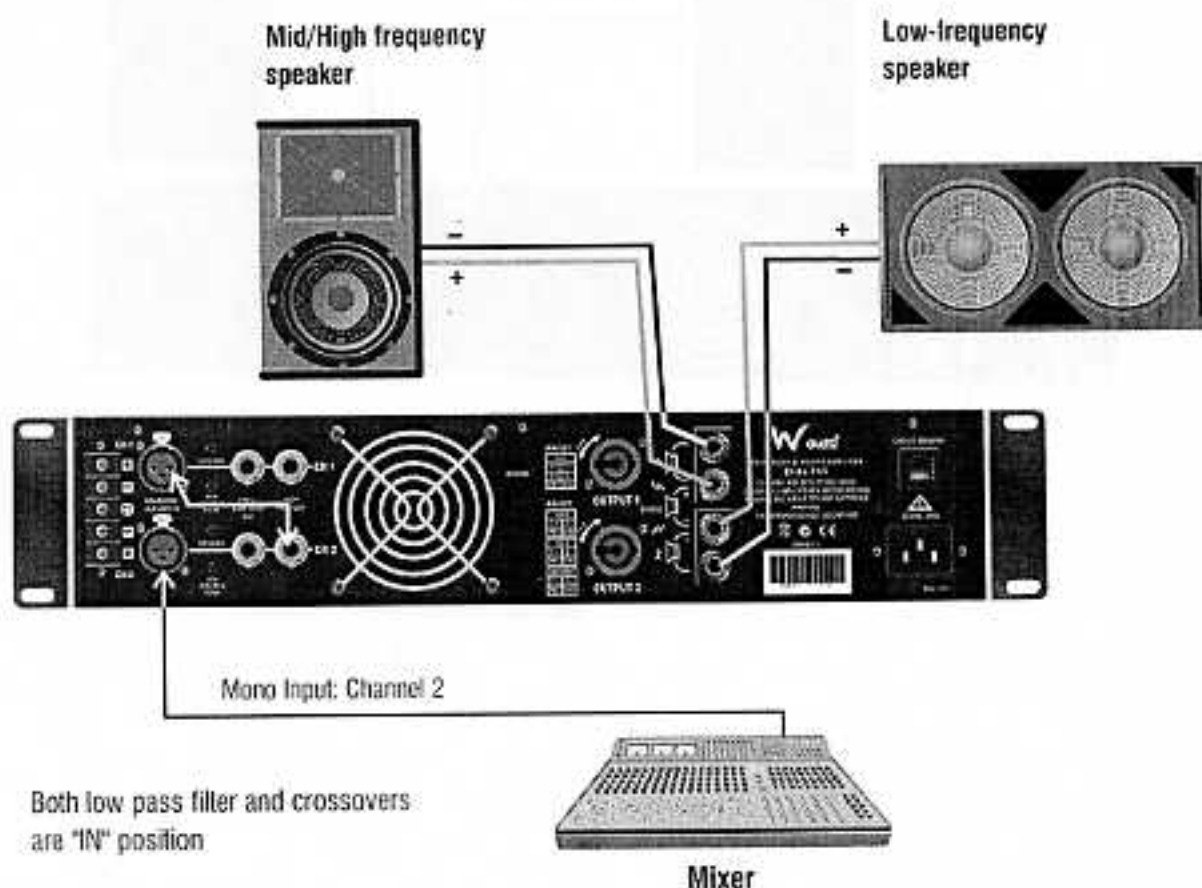
## 6.6 Mono Bi-Amped System Connection

The Mono Bi-Amped system requires the use of Crossover to handle low and mid/high frequency speakers separately with one mono input signal. As we all know, the crossover divides the full-range audio signal into two, three or four ranges to be delivered to separate speakers. In the case of a Mono Bi-Amped system, the role of the crossover is to divide a full-frequency audio signal into two signals (e.g. Low and high frequency). This amplifier is incorporated with two 150Hz Crossovers, giving easy access to complete a Bi-Amped system.

**Precautions:** With the power off, set this amplifier is in "Stereo" mode, and in the meanwhile, the channel 2 low pass filter switch (14) and crossover switch(15) should be "IN" position.

**Inputs:** Connect your input cable to CHANNEL 2 INPUT only. Meanwhile, use patch cable to short-circuit channel 2 high pass output with channel 1 input.

**Outputs:** Connect your low-frequency speaker to channel 2 output and mid/high frequency speaker to channel 1 output.



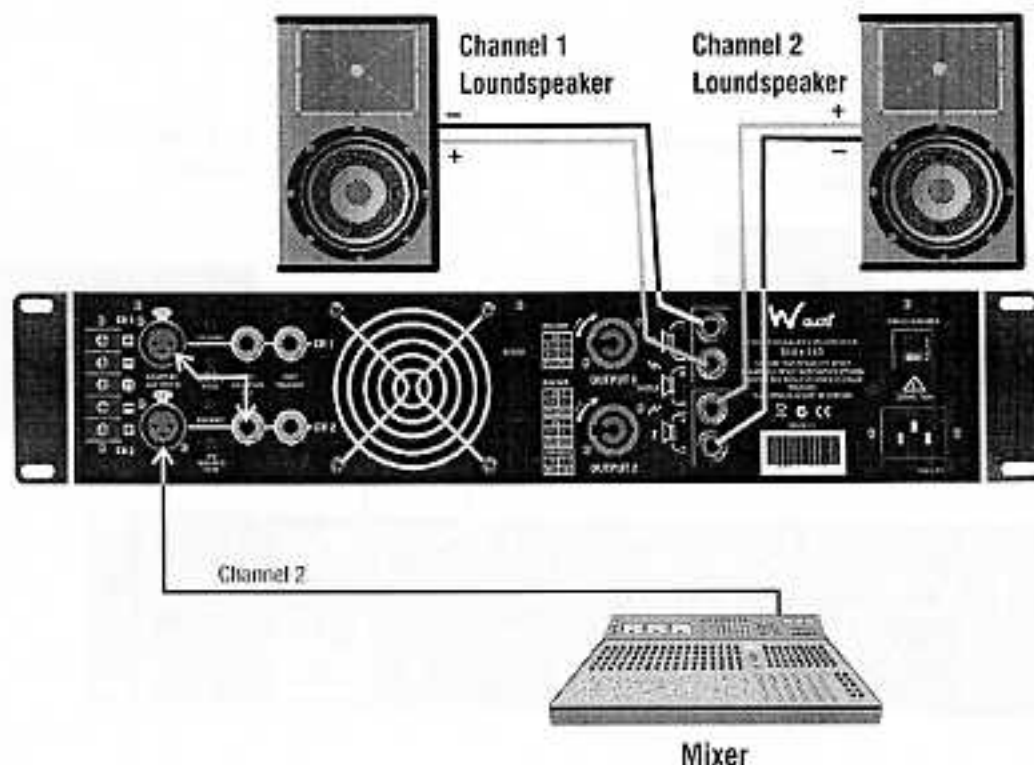
# 6.7 Parallel Mono Mode Connection

The Parallel Mono Mode allows you to drive two amplifier channel outputs with the same input signal. In Parallel Mono Mode, a signal into channel 2 input will drive both channel 1 and channel 2 outputs, and each channel output will drive its own speaker while keeping two separate gain controls.

**Precautions:** With the power off, set this amplifier is in "Stereo" mode.

**Inputs:** Connect your input cable to CHANNEL 2 INPUT only. Meanwhile, use patch cable to have channel 2 low pass output and channel 1 input short-circuited.

**Outputs:** Connect your loudspeaker to channel 1 and channel 2 outputs.



## 7 OPERATION

### 7.1 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.

### 8.2 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.
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. **WARNING:** 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 loudspeaker 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.

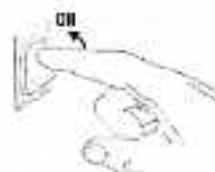
**Operating with a 2-ohm load is not recommended, as the amplifier might shut down.**

**Remember:** We are not liable for damage that results from overdriving other system components.

### 7.3 Power Switch

Before applying power, check all connections and turn down the gain controls.

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



## 7.4 Gain Controls

These two gain controls are used to adjust the input gain of each channel.

## 7.5 LED Indicators

The yellow signal LED (**SIG**) indicators flash dimly when a very low-level signal is present in the output. They flash brightly when a louder signal is present at the output.

The red clipping LED (**CLIP**) indicators flash during overload (clipping).

The green power LED (**PWR**) indicators light when the AC mains power is being supplied to the amp and both channels are operational.



## 7.6 Fan Cooling

The fan speed varies automatically to maintain safe internal temperatures. Keep the front and rear vents clear to allow full air flow.

Hot air exhausts out the front of the amp so it does not heat the interior of the rack. Make sure that plenty of cool air can enter the rack, especially if there are other units which exhaust hot air into it.

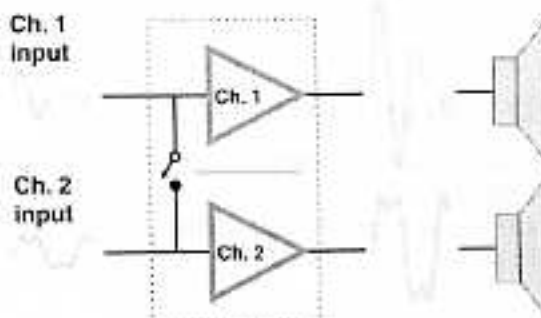
## 7.7 Safe Operating Levels

The amp's protective muting system guards against excessive internal temperatures. With normal ventilation and 4- to 8-ohm loads, the amplifier will handle any signal level including overdrive-but make sure that the speakers can handle the full power! However, lower load impedances and higher signal levels produce more internal heating. Into 2-ohm loads, frequent or prolonged clipping (indicated by constant flashing of the red CLIP LED) may trigger protective muting. Bridged mono mode doubles the output impedance of the amp; 4 ohms is the minimum load impedance. Heavy clipping may cause muting. If this happens, see Troubleshooting in this manual.

## 7.8 Stereo Mode Operation

This is the 'normal' way of using the amplifier, in which each channel is fully independent. This unit has two channels for stereo operation. Separate signals connect at the inputs, the gain knobs control their respective channels, and separate speakers connect to each output.

### Stereo Mode



## 7.9 Bridge Mono Mode Operation

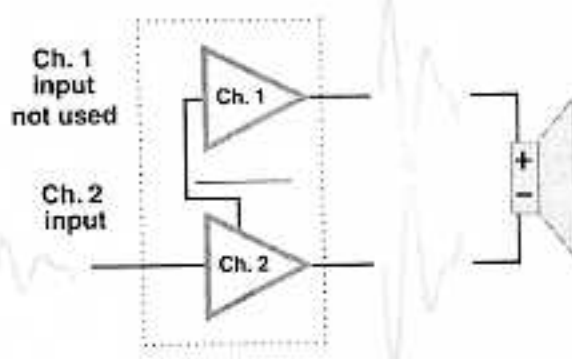
The Bridge mode on stereo amplifier is often misunderstood relating to actual operation and usage. In basic terms, when a 2-channel amplifier is operated in the BRIDGE mode, it is converted into a single-channel unit with a power rating equal to the sum of the power rating for each channel, at a load of twice that of the single-channel rating. For example, the 1K8 is rated at 750 watts RMS per channel into 2 ohms. The Bridge rating is 1500 watts RMS into 4 ohms (minimum load). Bridge mode operation is accomplished by placing the MODE switch in the BRIDGE position, using only the CHANNEL 2 Speakon or the red binding posts for the output, and using the CHANNEL 2 input. All CHANNEL 1 functions are deleted and serve no purpose now. Bridge mode operation can be used to drive sound distribution systems in very large public address applications. Another common use for the Bridge mode is in sub-woofer applications where very high power level are required to reproduce extremely low frequencies with adequate headroom. Such enclosures usually contain 2 or 4 loudspeakers to handle the power level involved. For Bridge mode usage, the enclosure impedance must be 4 or 8 ohms - **never** below 4 ohms.

This mode combines the full power capabilities of both channels into a single speaker system. The amplifier internally re-configures so that both channels operate as a unit. This delivers double the output voltage, resulting in four times the peak power and three times the sustained power into a single 8- or 4-ohm speaker load.

### Precautions:

1. Bridge Mono mode makes it possible to drive thousands of watts into a single speaker. AC current consumption will usually be higher. Avoid excessive signal level, and make sure the wiring and speaker can handle the power.
4. If the load is 4 ohms or less and prolonged overloads occur, the amplifier will probably mute for several seconds during peaks, and the circuit breaker may trip.
5. Do not use 2-ohm loads.

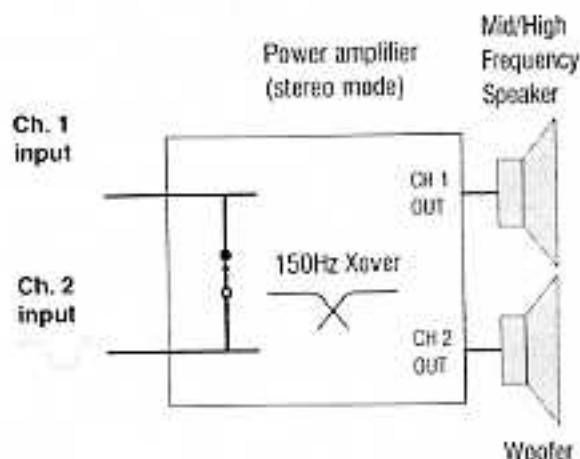
### Bridge Mono Mode



## 7.10 Mono Bi-Amped Mode Operation

As per previous crossover discussion, this amplifier is capable of divide a full-range audio signal into two signals to drive a 2-way speaker system to complete a Bi-Amped system. A 2-way speaker system consists of a tweeter and a woofer.

**Precautions:** With the power off, set this amplifier is in "Stereo" mode, and in the meanwhile, the channel 2 low pass filter switch (14) and crossover switch(15) should be "IN" position.

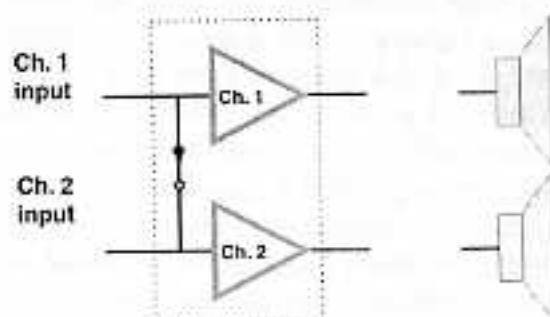


### 7.11 Parallel Mono Mode Operation

In Parallel Mono Mode, this amplifier allows you to use one input signal to feed both channel 1 and channel 2 outputs, then you can patch the input signal onto additional amplifiers by using the remaining input jacks.

In Parallel Mono Mode, each channel output is controlled by the corresponding gain control respectively.

**Precautions:** With the power off, set this amplifier is in "Stereo" mode, and set both gain controls to zero (fully counter-clockwise).



## 8 Troubleshooting

( = Lit   = Blinking   ● = Off )

### Problem: No Sound

#### ➤ Indication: Power Indicator Not Lit.



1. Check the AC plug. Also check the circuit breaker on the rear panel.
2. Confirm that the AC outlet works by plugging in another device. If too many amplifiers are used on one outlet, the building's circuit breaker may trip and shut off power.
3. An overload in bridged mono mode may cause the amplifier to click off for several seconds. Check the load impedance (4 ohms minimum), or reduce signal level.
4. An amplifier which keeps shutting off may have a serious internal fault. Turn it off, remove AC power, and have the amplifier serviced by a qualified technician.

#### ➤ Indication: Signal LED Responding To Signal Level.



1. If the yellow SIGNAL indicators are lighting normally, the fault is somewhere between the amp and the speaker. Check the speaker wiring for breaks. Try another speaker and cabin.

#### ➤ Indication: Clip LED Flashing.



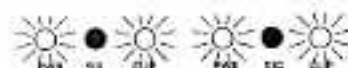
1. If the red CLIP indicator flashes when signal is applied, the amplifier output may be shorted. Check the speaker wiring for stray strands or breaks in the insulation.

#### ➤ Indication: Signal LED Not Lit.



1. If the green POWER indicator LED is lit and the fan is running, yet the signal LEDs indicate no signal, check the input. Make sure the signal source is operating and try another input cable. Connect the source to another channel or amplifier to confirm its operation.
2. Overheating will cause protective muting. The fan will be running at full speed and the chassis will be hot to the touch; sound should resume within a minute as the amplifier cools to a safe operating temperature. Check for proper ventilation. If the fan isn't running at all, the amplifier requires servicing.

#### ➤ Indication: Clip LEDs Bright And Steady.

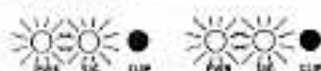


- The amplifier is in protective muting.
1. One second of muting is normal when the amp is turned on or off.
  2. Overheating will cause protective muting. The fan will be running at full speed and the chassis will be hot to the touch; sound should resume within a minute as the amplifier cools to a safe operating temperature. Check for proper ventilation. If the fan isn't running at all, the amplifier requires servicing.

## Troubleshooting(continued)

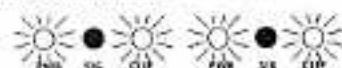
### Problem: Distorted Sound

#### ➤ INDICATION: CLIP LED FLASHING.



1. If the red CLIP indicator flashes before the signal indicator does, the load impedance is abnormally low or shorted. Unplug each speaker one-by-one at the amplifiers. If the CLIP LED goes out when you disconnect a cable, that cable or speaker is shorted. Try another cable and speaker to locate the fault.

#### ➤ Indication: Clip Indicator Not Flashing.



1. This could be caused by a faulty speaker or loose connection. Check the wiring and try another speaker.
2. The signal source may be clipping. Keep the amplifier gain controls at least halfway up so that the source does not have to be overdriven.



### Problem: No Channel Separation



1. Check the switch settings on the back of the amplifier. Make sure the "Parallel Input" and "Bridge Mode" switches are OFF in dual channel, bi-amp, or stereo use where different signals go to each channel.
2. Make sure other equipment in the signal path, such as mixers, preamps, etc., are set for stereo, not mono.



### Problem: Hum



1. Move cabling and signal sources to identify "hot spots" in the system. Cables with faulty shielding are a frequent entry point for hum.

### Problem: Hiss



1. Unplug the amplifier input to confirm that the hiss is coming from the source or a device upstream; erratic or popping noises indicate an electronic fault in the offending unit.
2. To keep the normal noise floor low, operate the primary signal source at full level, without clipping, and avoid boosting the signal further between the source and the amplifier.



### Problem: Squeals And Feedback



1. Microphone feedback should be controlled with mixer controls. If noise continues to build up with zero mic gain, there is a serious fault in the signal processors or cables. Working in succession from the signal source towards the amplifier, check each device in the signal path by reducing its gain or unplugging it.

**9 Technical specifications**

| <b>ITEM</b>                                                                                                                                                          | <b>1K8</b><br>230VAC ~ 50Hz                                                  | <b>2K5</b><br>230VAC ~ 50Hz                         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|-----------------------------------------------------|
| <b>Hum &amp; Noise</b><br>Stereo mode, below rated output power,<br>4 ohms                                                                                           | 100, unweighted                                                              | 100, unweighted                                     |
| <b>DISTORTION :</b><br>SMPTE-IM                                                                                                                                      | Less than 0.01%                                                              | Less than 0.01%                                     |
| <b>Input Sensitivity &amp; Impedance :</b><br>@ rated output power, 4 ohms<br>Balanced, XLR jack<br>Gain                                                             | 1.0VRMS (0dBV)<br>10K ohms per leg<br>34dB (50X)                             | 1.26VRMS(+2.0dBV)<br>10K ohms per leg<br>34dB (50X) |
| <b>DISTORTION : (THD, typical value)</b><br>Stereo mode, both channels driven, 4 ohms<br>20Hz to 20kHz, 10dB below rated power<br>20Hz to 20kHz, at full rated power | Less than 0.03%<br>Less than 0.03%                                           | Less than 0.03%<br>Less than 0.03%                  |
| <b>FREQUENCY RESPONSE :</b><br>Stereo mode, both channels driven<br>+0, -1dB @ 1W RMS, 4 ohms<br>+0, -3 dB @ 1W RMS, 4 ohms                                          | 20Hz to 20kHz<br>5Hz to 50kHz                                                | 20Hz to 20kHz<br>5Hz to 50kHz                       |
| <b>DAMPING FACTOR: (Typical value)</b><br>Stereo mode, both channels driven<br>8 ohms, 1kHz                                                                          | Greater than 300                                                             | Greater than 300                                    |
| <b>POWER CONSUMPTION :</b><br>Stereo mode, both channels driven<br>@ 1/8 rated output power, 4 ohms<br>@ 1/8 rated output power, 4 ohms                              | 7A @ 120VAC<br>4A @ 230VAC                                                   | 7A @ 120VAC<br>4A @ 230VAC                          |
| <b>TOPOLOGY :</b>                                                                                                                                                    | Class AB                                                                     | Class H                                             |
| <b>WEIGHT :</b>                                                                                                                                                      | 45 lbs. (20.5kg)                                                             | 49 lbs (22.3kg)                                     |
| <b>FEATURE SET :</b>                                                                                                                                                 |                                                                              |                                                     |
| <b>COOLING SYSTEM</b>                                                                                                                                                | 2-speed DC fan, air flow from back to front                                  |                                                     |
| <b>LOW PASS FILTER</b>                                                                                                                                               | -3dB @ 40Hz, 12 dB per octave                                                |                                                     |
| <b>CROSSOVER</b>                                                                                                                                                     | 150 Hz, 4-pole Linkwitz-Riley approximation                                  |                                                     |
| <b>INPUT</b>                                                                                                                                                         | Electronic balanced; Barrier Strip and XLR                                   |                                                     |
| <b>CROSSOVER OUTPUTS</b>                                                                                                                                             | Low/High and High, TS 1/4" (6.3 mm)                                          |                                                     |
| <b>AMPLIFIER OUTPUTS</b>                                                                                                                                             | Speakers for Channel 1, Channel 2 & Bridge; Binding Posts                    |                                                     |
| <b>LED INDICATORS</b>                                                                                                                                                | Green Led - Power; Yellow Led - Signal; Red Led - Clipping                   |                                                     |
| <b>AMPLIFIER PROTECTION</b>                                                                                                                                          | Full short circuit, open circuit, over-temperature; RF; stable into any load |                                                     |
| <b>LOAD PROTECTION</b>                                                                                                                                               | Turn on/off muting, DC (rail crowbar), low pass filter                       |                                                     |
| <b>MAINS VOLTAGES AVAILABLE</b>                                                                                                                                      | 100VAC, 120VAC, 230VAC and 240VAC 50-60 Hz                                   |                                                     |
| <b>DIMENSION</b>                                                                                                                                                     | Height: 3.5" (8.9 cm), Width: 19" (48.3 cm), Depth: 15.5" (39 cm)            |                                                     |

**Specifications Subject To Change Without Notice!**