

**MixPak Plus+**  
**Multi-Channel Powered Mixer**  
**Operation Manual**



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## INTRODUCTION

The Biamp **MixPak Plus+** is a flexible multi-channel mixer, a low distortion 300 Watt power amplifier, and a low noise 9-band graphic equalizer, all wrapped up in a single compact package. Every aspect of the MixPak, including the innovative road worthy case, has been designed to provide a level of performance that surpasses other equipment in its class. Biamp's tradition of innovation and value continues with the addition of the MixPak to the growing family of quality professional sound equipment.

The MixPak Plus+ features:

- Standard input channels that can be used as inputs for low or high impedance microphones, or instruments such as guitar, bass, or keyboards. Each channel provides controls for Monitor send level, High and Low frequency equalization, Main mix level, and Effects send level.
- Two additional Plus+ inputs, which have been specifically designed to meet the special demands of electronic instruments. These inputs use ultra low noise, high slew rate circuitry to ensure superb sound quality for digital electronic keyboards and electronic drums.
- A rugged 300 Watt power amplifier, which includes Biamp System Auto-Limit circuit. Auto-Limit is a fast attack, quick release peak limiter that provides full power output and at the same time prevents power amplifier clipping. An eight-segment, front panel LED display shows the amplifier output level and indicates when the Auto-Limit circuit is working.

- A low noise 9-band graphic equalizer with 1-octave spacing, that provides 15dB of cut and boost for total control of the system frequency response.
- A built-in quality multi-spring reverb. The Main and Monitor reverb levels can be controlled separately and, unlike other mixers, the reverb can be used along with external effects units.
- Separate Effects Return level controls for the Main bus, and the Monitor bus. Separate controls allow control of how much of the external effect will be added to the Main signal and how much will be added to the Monitor signal. When the time comes to expand the MixPak, more channels can be added to the system by plugging the output of another mixer into the MixPak's Effects Return jack. In this case, the separate controls allow assignment of the added channels to the Main bus, the Monitor bus, or both.
- Full patching capabilities. The MixPak's seven front panel patching jacks let you use the mixer, the graphic equalizer, and the power amplifier separately or along with other equipment. The patching jacks give almost unlimited flexibility to add more equipment, and expand the system to meet your needs.
- Optional rack-wings, nylon carrying bag, and autoformer for driving distributed speaker systems.
- Five-Year 'Gold Seal' Warranty.

The MixPak Plus+ is the heart of a self contained, high-power sound system with the flexibility to grow and expand. All you need for a complete system is microphones and speakers.

# SYSTEM DESCRIPTION

## Input Channels

Each of the Input Channels provides: a Main level control, High and Low EQ controls, a Monitor level control, and an Effects send control.

The low Z inputs are XLR type 3-conductor input jacks. They are designed for balanced low impedance microphones.

The high Z inputs are 1/4" 2-conductor unbalanced input jacks, and are used for high impedance microphones, piezo instrument pick-ups, wireless microphones, or other unbalanced low level inputs. These inputs have been designed to accept inputs directly from a guitar or bass instrument, eliminating the need for direct boxes or instrument pre-amps.

The Plus+ Inputs are 1/4" 2-conductor unbalanced input jacks. These inputs have been designed specifically for electronic keyboards and electronic drum machines.

The new generation of digital electronic instruments can generate very fast, complex waveforms, with a wide dynamic range. The Plus+ Input circuitry uses state-of-the-art ultra low noise, high speed circuitry to reproduce these difficult signals clearly and quickly, without distortion.

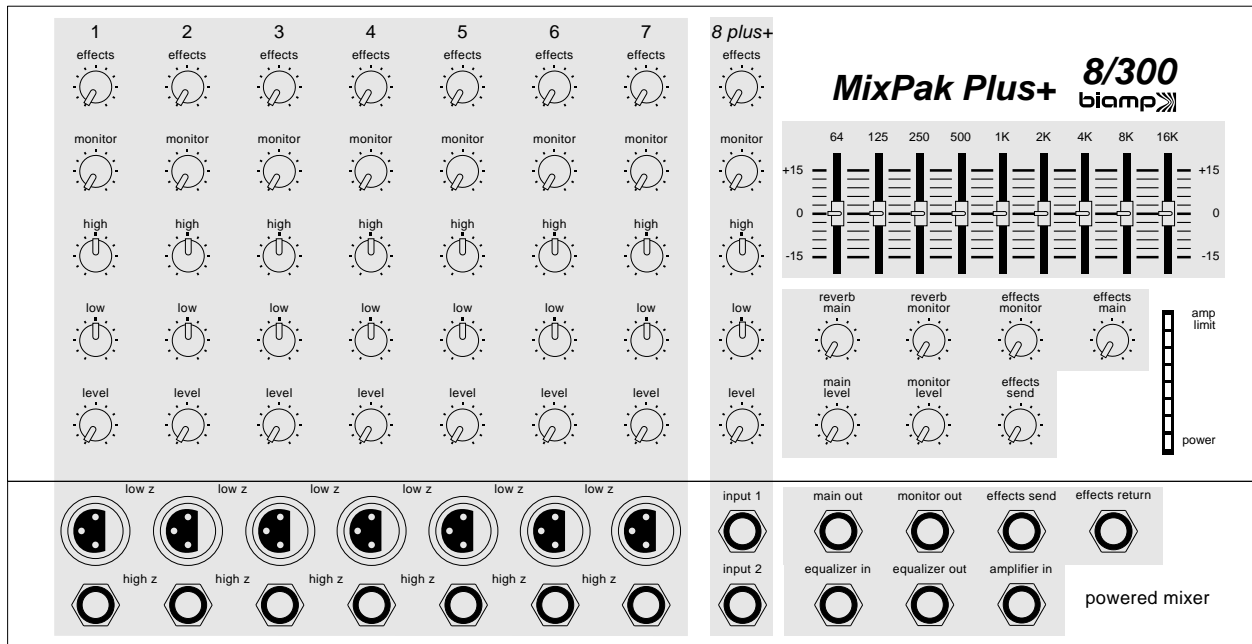
## Graphic Equalizer Section

The graphic equalizer divides the audio spectrum into 9 bands. Each band is one octave wide and is centered on ISO standard frequencies. Each control provides up to 15dB of cut and boost at its center frequency. Each mark above and below the center position changes the level by 3dB.

The equalizer is used to adjust the system frequency response, compensate for room acoustics, and can also be used to help reduce feedback.

The graphic equalizer is internally connected (normalled) between the mixer section and the power amplifier. When you want to use the graphic equalizer for other signals, for example the monitor signal, use the Equalizer In and Equalizer Out jacks on the front panel to make the connections.

The Equalizer In and Out jacks give you the flexibility to use the graphic equalizer separately, to add equipment, or to use it at another point in the system.



## Input & Output Patching

The system patch points are 2-conductor 1/4" unbalanced jacks that allow separate access to:

- the mixer Main Out
- the mixer Monitor Out
- the mixer Effects Send
- the graphic equalizer input & output
- the power amplifier input
- the mixer Effects Return for returning signals to the Main and Monitor, from effects, tape decks, or other mixers.

The input and output jacks allow almost unlimited flexibility to add equipment, or to expand and enlarge the system.

## System Level Controls

The system controls let you adjust:

- the level of the Main Out signal
- the level of the Monitor Out signal
- the level of the Effects Send signal
- the amount of reverb in the Main mix
- the amount of reverb in the Monitor mix
- the amount of Effects Return signal added to the Main mix
- the amount of Effects Return signal added to the Monitor mix

# INPUT CHANNELS & EQUALIZER IN/OUT

## High Z

This 1/4" 2-conductor unbalanced input jack is used as an input for instruments, such as a guitar or bass, piezo instrument pick-ups, wireless microphones, and high impedance microphones. This input has been designed so you can plug directly from a guitar or bass into the mixer.

## Low Z

This 3-conductor XLR input is used for low impedance balanced microphones. These connectors are wired with Pin 2 high (+), Pin 3 low (-), and Pin 1 shield (ground).

## Level

This control determines the level of the channel signal sent to the Main mix.

## Low EQ

This control adjusts the low frequency (bass) response of the input channel and provides up to 18dB of cut or boost at 50Hz. When the control is centered the frequency response is "flat".

## High EQ

This control adjusts the high frequency (treble) response of the input channel and provides up to 18dB of cut or boost at 18kHz. When the control is centered the frequency response is "flat".

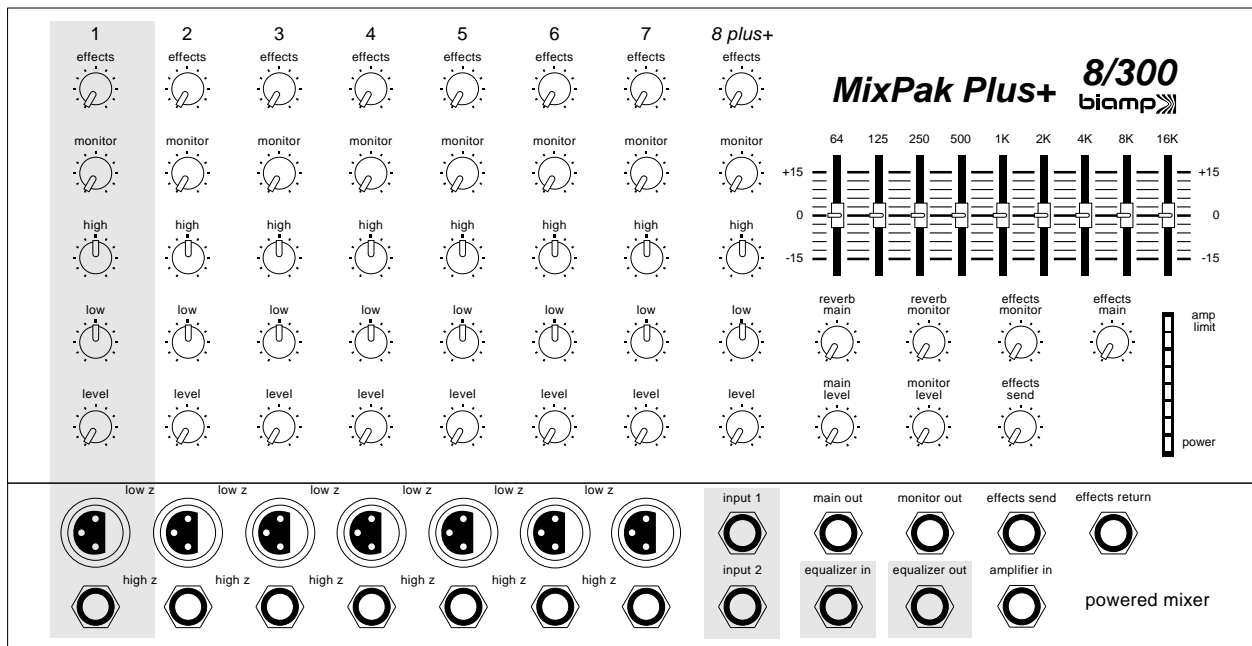
## Monitor

This control adjusts the level of the channel signal sent to the Monitor mix. This signal is taken before the Level control and before

the Low and High EQ controls (pre-fader and pre-EQ). Changing the Level, Low, and High controls will not affect the Monitor signal. The Monitor signals from all the channels are combined and applied to the Monitor Out jack.

## Effects

This control adjusts the level of the channel signal sent to the Effects Send mix. The Effects signal is taken after the Level control and after the Low and High EQ controls (post-fader and post-EQ). Changing the Level, Low, and High controls will also change the Effects signal. The Effects signals from all the channels are combined and are applied to the internal reverb unit and to the Effects Send jack.



## Plus+ Inputs

These 1/4" 2-conductor unbalanced jacks are high impedance inputs that have been specifically designed for electronic keyboards and drum machines.

When both Input 1 and Input 2 are used, the signals are combined into one. Set the balance between the two inputs by adjusting the output level controls on your keyboard or drum machine.

The controls on the Plus+ channel (Level, High & Low EQ, Monitor, and Effects) work the same way as the controls on the standard channels, and control both Plus+ inputs equally.

## Equalizer In

This 1/4" 2-conductor unbalanced jack gives you access to the graphic equalizer input. Normally the Main Out signal from the mixer travels through this jack to the graphic equalizer input.

When a plug is inserted into this jack the Main mixer signal is disconnected. The graphic equalizer will now get its input signal from the device plugged in here.

Use this jack when you want to use the graphic equalizer for the Monitor signal, the Effects signal, or when you want to use the equalizer with external equipment.

## Equalizer Out

This 1/4" 2-conductor unbalanced jack gives you an additional output from the graphic equalizer. Using this jack does not interrupt the internal connection between the graphic equalizer and the power amplifier. This jack is typically used when you need an additional equalized signal to feed an external power amplifier or another piece of equipment.

# MIXER OUTPUTS & CONTROLS

## Main Level

This is the main system volume control when the Equalizer In and Amplifier In patch jacks are not used. This control also adjusts the level of the signal at the Main Out jack. The Main signal is a combination of all the input channel main Level signals.

## Monitor Level

This control adjusts the level of the signal at the Monitor Out jack. The Monitor signal is a combination of all the input channel Monitor signals.

## Effects Send

This control adjusts the level of the signal at the Effects Send jack. The Effects signal is a combination of all the input channel Effects signals.

## Effects Main

This control adjusts the amount of Effects Return signal mixed with the Main signal.

## Effects Monitor

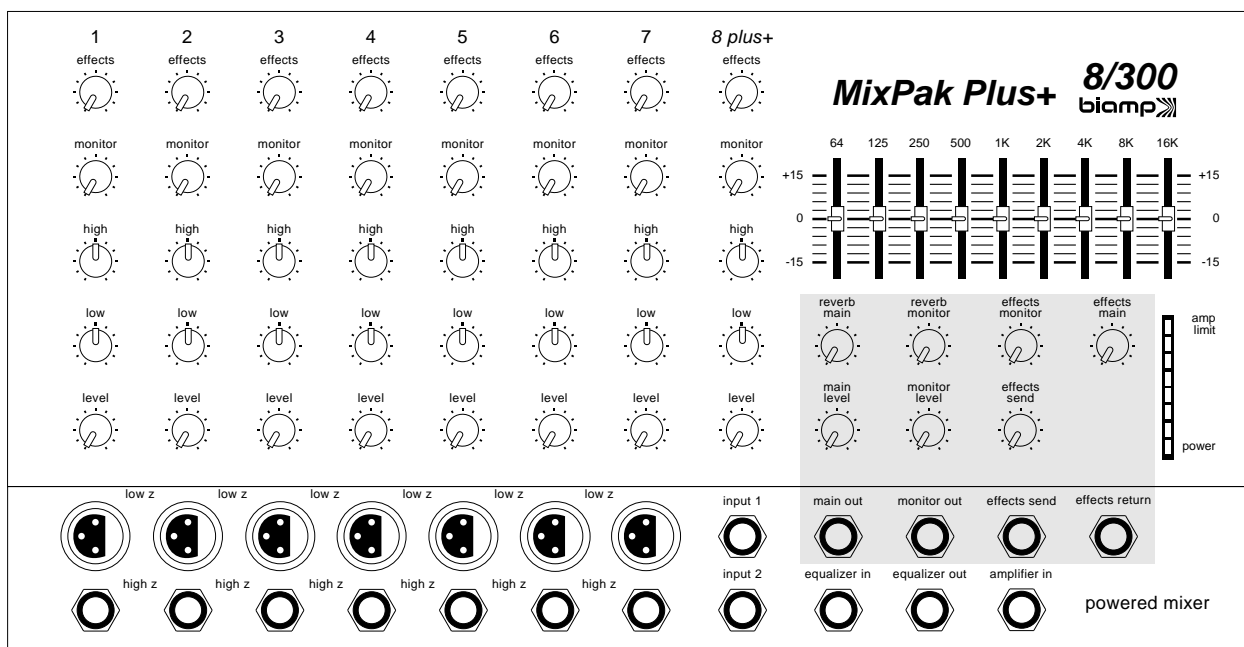
This control adjusts the amount of Effects Return signal mixed with the Monitor signal.

## Reverb Main

This control adjusts the amount of signal from the internal reverb mixed with the Main signal.

## Reverb Monitor

This control adjusts the amount of signal from the internal reverb mixed with the Monitor signal.



## Main Out

This output jack is used when you want to expand the system, for example, when an extra main out signal is needed to drive an external equalizer or amplifier. A typical example would be when you are using the MixPak's graphic equalizer and power amplifier for the monitor system and need a main out signal to drive an external amplifier for the mains.

This signal is taken before the graphic equalizer section and is controlled by the Main Level control. Using this jack does not affect the signal sent from the mixer section to the graphic equalizer and the power amplifier.

## Monitor Out

This output jack is used when you want to drive an amplifier for a monitor system. If you want to use the MixPak's amplifier for monitors, you can connect this jack to the Amplifier In jack. Or if you want to use the MixPak's graphic equalizer and power amplifier for the monitor system, you would connect this jack to the Equalizer In jack.

This signal is a combination of the Monitor signals from all the input channels. The level of this signal is controlled by the Monitor Level control.

## Effects Returns

This 1/4" 2-conductor unbalanced input to Main and Monitor is used for external effects signals and can also be used as an

input for tape playback. When you want to add more input channels to the MixPak, plug the output of another mixer into this jack.

The Effects Main control adjusts how much of this signal goes to the Main.

The Effects Monitor control adjusts how much of this signal goes to the Monitor.

## Effects Send

This 1/4" 2-conductor unbalanced output is used to send a signal to external effects units for processing. This signal is a combination of the Effects signals from all the input channels.

The Effects Send control adjusts the level of the signal at this jack.

# GRAPHIC EQUALIZER & AMPLIFIER

## Equalizer

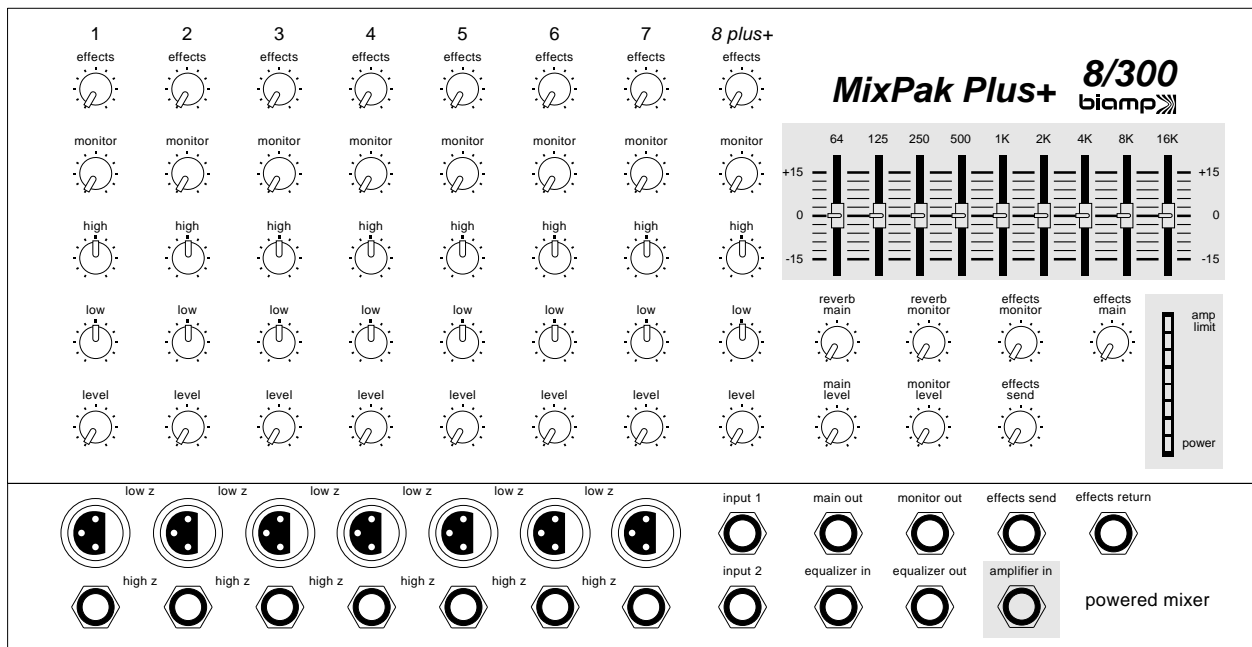
The MixPak graphic equalizer allows 15dB of boost or cut in each of the nine frequency bands, from 64Hz to 16kHz. The graphic equalizer is used to set the overall response of the system, boosting areas where more output is needed, or cutting areas where less output is needed. The settings of the equalizer will depend on the sound desired, the room acoustics, and the response of the microphones and speakers used with the MixPak.

With the control centered, the response is flat, no boost or cut. As you slide the control up, the response is boosted, while sliding the control down cuts the response. Each small mark changes the level by about 3dB.

The equalizer can also provide some help to reduce system feedback. Feedback in any sound system is caused by peaks in the frequency response. The peaks may be due to: microphones, speakers, speaker crossovers, or reflections from the surrounding surfaces. When the overall system response is smoothed out, feedback is less likely to happen.

When feedback does happen, use the graphic equalizer to reduce the response about 3dB at the feedback frequency. The volume of the system can usually be increased by 3dB to 6dB after carefully adjusting the graphic equalizer to reduce feedback problems.

The MixPak graphic equalizer is internally connected (normalled) between the output of the mixer and the input of the power amplifier. This internal connection allows the MixPak to be used as a self-contained system without extra cables. The Equalizer In and Equalizer Out jacks let you patch into or out of the equalizer when you want to add equipment or use the graphic equalizer for other signals.



## Amplifier In

This 1/4" 2-conductor unbalanced jack gives you access to the input of the MixPak's power amplifier. This input can be used when you need to add other equipment in front of the amplifier or when you want to use the amplifier to drive monitor speakers. Inserting a plug in this jack breaks the internal connection between the output of the graphic equalizer and the input of the power amplifier.

## Display

The 8-segment display serves three functions.

The first green segment at the bottom of the display indicates power to the unit is on.

The next five green segments show the relative power output of the amplifier. Each segment corresponds to an increase of approximately 4dB in output power. The segment next to the top is yellow to let you know that the amplifier is approaching full output power.

The top segment is red and indicates when the Auto-Limit circuit is working.

The Auto-Limit circuit constantly monitors the amplifier signals. When the output signal approaches its maximum value for either voltage or current, the Auto-Limit circuit instantly reduces the level of the input signal, thereby preventing the harsh sounding distortion caused by clipping. When the amplifier output signal drops, the Auto-Limit circuit quickly restores the input signal to its full level without any audible effects.

The design of the Auto-Limit circuit ensures maximum power output without clipping, regardless of the impedance of the speakers.

## REAR PANEL FEATURES

### AC Power Cord Receptacle

The Power Cord Receptacle accepts the detachable AC Power Cord. The AC Power Cord is for connection to three-prong grounded AC outlets.

**CAUTION:** Do not remove or defeat the ground prong on the AC Power Cord, as this constitutes a shock hazard.

### AC Fuse Clip

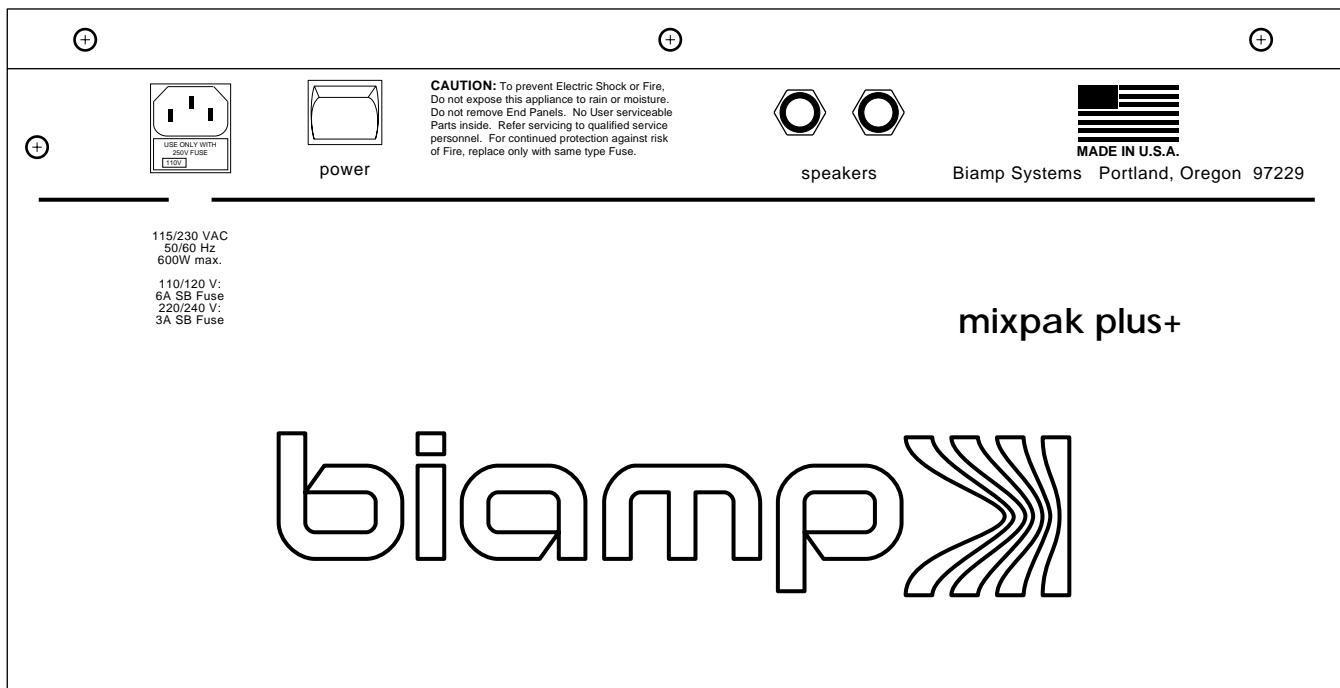
The Fuse Clip may be removed by first detaching the AC Power Cord, then prying the Fuse Clip out from the top, using a flat-blade screwdriver in the notch provided. The Fuse Clip contains both the standard fuse and an alternate fuse. The standard fuse is held in the clip. When the Fuse Clip is installed, this is the actual AC fuse. Replace the standard fuse only with the same value and type (6 A SB for "110" or 3 A SB for "220"). The alternate fuse, held in a drawer inside the Fuse Clip, is for use at the "220" setting.

### Voltage Selector

To change the operational voltage, slide the voltage selector out of the left side of the Fuse Clip, turn the voltage selector over, and slide it back into the Fuse Clip with the desired voltage visible through the window. Then change the fuse value before re-installing the Fuse Clip.

### Power Switch

This switch controls the AC power to all of the circuits in the MixPak. When the AC power cord is plugged in and this switch is in the "ON" position, the green indicator at the bottom of the front panel display should be lit.



### System Ventilation

The MixPak has been designed to provide the highest possible efficiency. However, all high power amplifiers generate heat during operation. To ensure a long, happy life and optimum performance, the MixPak uses a large "Turbulent Flow" heatsink assembly to remove excess heat. When you are setting up the MixPak, make sure the vents on the top and the bottom of the chassis are not blocked.

### Speaker Jacks

The speaker jacks are standard 1/4" 2-conductor unbalanced jacks. The jacks are wired in parallel and either or both jacks can be used to make connection to the speaker system. Speaker cables should be 18 gauge for short distances up to 25 feet. For longer distances, 16 gauge cable should be used.

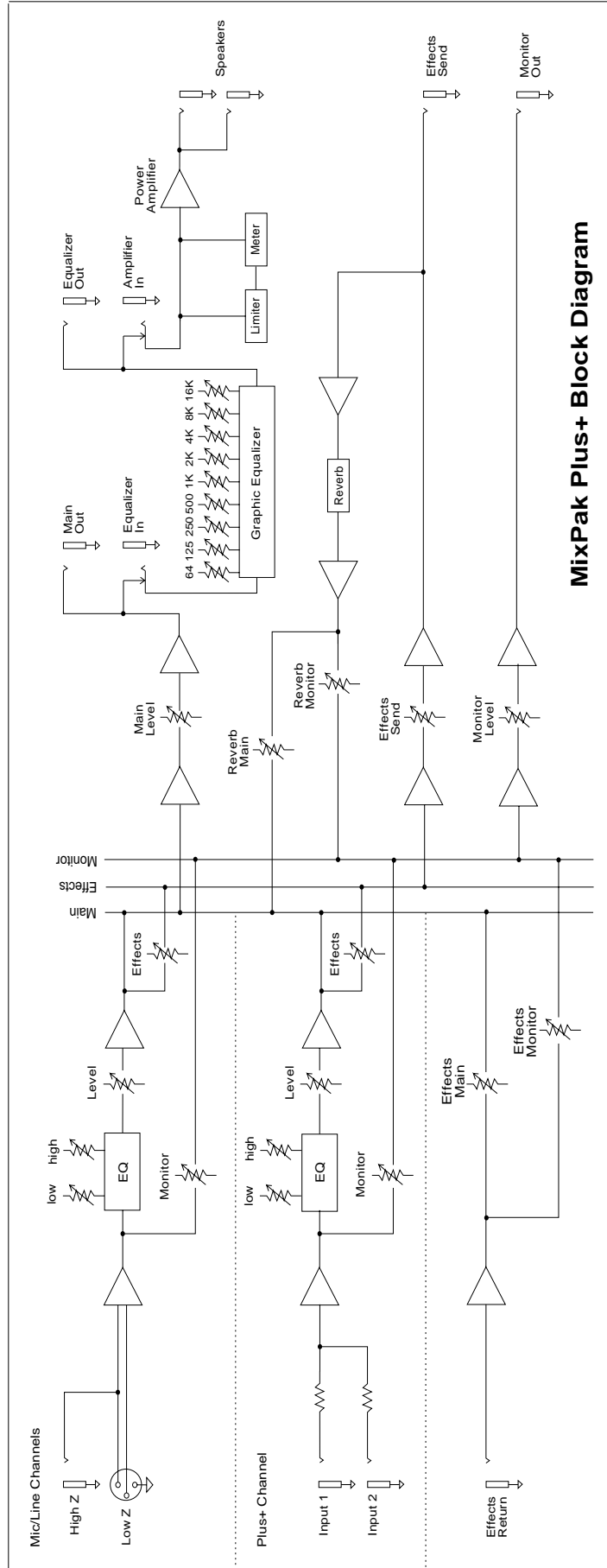
The MixPak has been designed to provide maximum power with loads that total 4 ohms or higher. Plugging an 8 ohm speaker into each of the Speaker jacks results in a combined load of 4 ohms. Since the jacks are wired in parallel, 8 ohms in parallel with 8 ohms equals a total load of 4 ohms.

Prolonged high power operation into loads less than 4 ohms may cause the MixPak's thermal protection circuit to activate and remove AC power from the unit. Power will return to the unit automatically after sufficient cooling has taken place.

## APPLICATIONS DIAGRAMS



# BLOCK DIAGRAM



**MixPak Plus+ Block Diagram**

# SPECIFICATIONS

## MIXER SECTION

Frequency Response (20Hz~20kHz, High Z input)	+0/-1dB
Total Harmonic Distortion (20Hz~20kHz)	< 0.02%
Intermodulation Distortion (SMPTE)	< 0.08%
Equivalent Input Noise (20Hz~20kHz, 150 $\Omega$ termination)	-110dB
Common Mode Rejection Ratio (60Hz)	55dB
Slew Rate (Plus+ channel)	> 9V/ $\mu$ Sec

## MAXIMUM INPUT LEVELS / INPUT IMPEDANCES

Low Z Inputs	-1dBu / 2k $\Omega$
High Z Inputs	+16dBu / 500k $\Omega$
Plus Inputs	+8dBu / 100k $\Omega$
Effects Return	+8dBu / 10k $\Omega$
Equalizer In	+5dBu / 47k $\Omega$
Amplifier In	+5dBu / 4.7k $\Omega$

## MAXIMUM OUTPUT LEVELS / OUTPUT IMPEDANCES

Main Out (into 600 $\Omega$ min.)	+18dBu / 200 $\Omega$
Monitor Out (into 600 $\Omega$ min.)	+18dBu / 200 $\Omega$
Effects Send (into 2k $\Omega$ min.)	+18dBu / 200 $\Omega$
Equalizer Out (into 600 $\Omega$ min.)	+18dBu / 200 $\Omega$

## EQUALIZATION

Channel High EQ	$\pm$ 18dB @ 50Hz
Channel Low EQ	$\pm$ 18dB @ 15kHz
9-band Graphic Equalizer	$\pm$ 15 @ 64Hz~16kHz

## AMPLIFIER SECTION

Frequency Response (20Hz~20kHz @ rated power)	+0/-0.5dB
Total Harmonic Distortion	
(20Hz~20kHz @ 150 Watts into 4 $\Omega$ )	< 0.1%
(2kHz @ rated power into 4 $\Omega$ )	< 0.04%
Intermodulation Distortion	
(SMPTE @ 150 Watts into 4 $\Omega$ )	< 0.1%
(SMPTE @ rated power into 4 $\Omega$ )	< 0.15%
Slew Rate (into 4 $\Omega$ )	17V/ $\mu$ Sec
Signal-to-Noise Ratio	
(A-Weighted)	109dB
(20Hz~20kHz @ rated power)	102dB
Rated Output Power	
(1kHz into 4 $\Omega$ )	300 Watts RMS
(1kHz into 8 $\Omega$ )	190 Watts RMS

## POWER REQUIREMENTS

115/230VAC 50/60Hz

## POWER CONSUMPTION

< 600 Watts

## DIMENSIONS (including end panels)

Height	12.75" (324mm)
Width	19.8" (493mm)
Depth	9.35" (238mm)

## WEIGHT

< 25 lbs. (< 11kg)

## WARRANTY

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### BIAMP IS PLEASED TO EXTEND THE FOLLOWING 5-YEAR LIMITED WARRANTY TO THE ORIGINAL PURCHASER OF THE PROFESSIONAL SOUND EQUIPMENT DESCRIBED IN THIS OWNER'S MANUAL.

BIAMP Systems expressly warrants this product to be free from defects in material and workmanship for a period of 5 YEARS from the date of purchase as a new product from an authorized BIAMP dealer under the following conditions.

1. The Purchaser is responsible for completing and mailing to BIAMP, within 10 days of purchase, the attached warranty application.
2. In the event the warranted BIAMP product requires service during the warranty period, BIAMP will repair or replace, at its option, defective materials, provided you have identified yourself as the original purchaser of the product to any authorized BIAMP Service Center. Transportation and insurance charges to and from an authorized Service Center or the BIAMP factory for warranted products or components thereof to obtain repairs shall be the responsibility of the Purchaser.
3. This warranty will be VOIDED if the serial number has been removed or defaced; or if the product has been subjected to accidental damage, abuse, rental usage, alterations, or attempted repair by any person not authorized by BIAMP to make repairs; or if the product has been installed contrary to BIAMP's instructions.
4. The normal wear and tear of appearance items such as paint, knobs, handles, and covers is not covered under this warranty.
5. BIAMP SHALL NOT IN ANY EVENT BE LIABLE FOR SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, INCLUDING LOST PROFITS, LOSS OF USE, PROPERTY DAMAGE, INJURY TO GOODWILL, OR OTHER ECONOMIC LOSS OF ANY SORT. EXCEPT AS EXPRESSLY PROVIDED HEREIN, BIAMP DISCLAIMS ALL OTHER LIABILITY TO PURCHASER OR ANY OTHER PERSONS ARISING OUT OF USE OR PERFORMANCE OF THE PRODUCT, INCLUDING LIABILITY FOR NEGLIGENCE OR STRICT LIABILITY IN TORT.
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7. No action for breach of this warranty may be commenced more than one year after the expiration of this warranty.

Thank you for purchasing BIAMP...  
AMERICAN SOUND CRAFTSMANSHIP

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