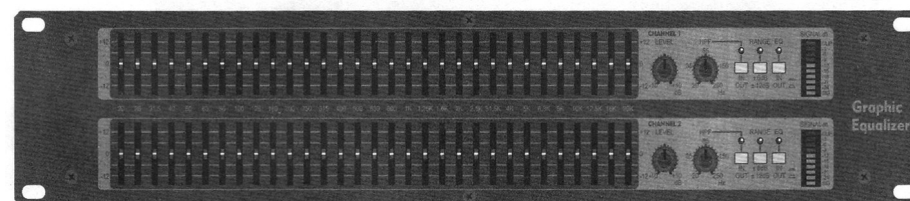
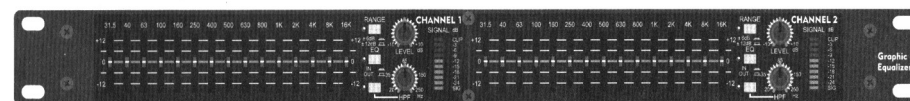




# 2-Series Graphic Equalizers



User Manual

Professional Audio Equipment

## Important Safety Instructions

### Consignes de sécurité à lire attentivement



The lightning flash with arrowhead symbol, within an equilateral 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 within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance instructions in the literature accompanying the device.

Le symbole de la foudre dans un triangle équilatéral symbolisant la foudre est prévu pour sensibiliser l'utilisateur à la présence de tension de voltage non isolée à l'intérieur de l'appareil. Elle pourrait constituer un danger de risque de décharge électrique pour les utilisateurs. Le point d'exclamation dans le triangle équilatéral alerte l'utilisateur de la présence de consignes qu'il doit d'abord consulter avant d'utiliser l'appareil.

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.
6. Do not use this apparatus near water.
7. Clean only with dry cloth.
8. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
9. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
10. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
11. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
12. Only use attachments/accessories specified by the manufacturer.
13. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
14. Unplug this apparatus during lightning storms or when unused for long periods of time.
15. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way such as power supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

1. Lisez ces instructions.
2. Conservez ces instructions.
3. Observez les avertissements.
4. Suivez ces instructions.
5. Pour réduire le risque de feu ou la décharge électrique, ne pas exposer cet appareil pour pleuvoir ou humidité.
6. Ne pas utiliser l'appareil près de l'eau.
7. Le nettoyer à l'aide d'un tissu sec.
8. Ne pas bloquer les ouvertures de ventilation, installer selon les consignes du fabricant.
9. Eloigner des sources de chaleur tel: radiateurs, fourneaux ou autres appareils qui produisent de la chaleur.
10. Ne pas modifier ou amputer le système de la mise à terre. Une prise avec mise à terre comprend deux lames dont une plus large ainsi qu'une mise à terre: ne pas la couper ou la modifier. Si la prise murale n'accepte pas la fiche, consulter un électricien pour qu'il remplace la prise défectueuse.
11. Protéger le cordon de secteur contre tous bris ou pincement qui pourraient l'endommager, soit à la fiche murale ou à l'appareil.
12. N'employer que les accessoires recommandés par le fabricant.
13. N'utiliser qu'avec les systèmes de fixation, chariots, trépied ou autres, approuvés par le fabricant ou vendus avec l'appareil.
14. Débrancher l'appareil lors des orages électriques ou si inutilisé pendant une longue période de temps.
15. Un entretien effectué par un centre de service accrédité est exigé si l'appareil a été endommagé de quelque façon: si il a été exposé à la pluie, l'humidité ou s'il ne fonctionne pas normalement ou qu'il a été échappé.

### FCC Compliance

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
2. This device must accept any interference received, including interference that may cause undesired operation

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 both a commercial and residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. 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.

action  
with the  
manual

## Introduction

Congratulations on your purchase of an Equalizer. Equalizers offer a wide range of professional features including:

- Silent In/Out Switching
- Signal Present and Clip LEDs
- Precision Wein Bridge Filters
- 20mm Faders
- Constant "Q" Design
- Switchable Low Cut Filter
- Selectable 12dB or 6dB Range
- Balanced XLR, 1/4" Inputs
- Servo-Balanced XLR, 1/4" Outputs

We are confident that you will be pleased with the high performance, superb sound quality, and reliability that equalizers is known for.

## Safety

In order to minimize the risk of injury, damage, or hearing loss, please read the entire owner's manual before connecting to a sound system.



The lightning flash with arrowhead symbol, within an equilateral 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 within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance instructions in the literature accompanying the device.

## Equalizers

Equalizers use "Q" enhanced Wein bridge filters and interleaved summing for constant "Q", low ripple, and minimum filter interaction. A servo-balanced output stage simulates a true transformer output to allow interfacing with virtually any type of load.

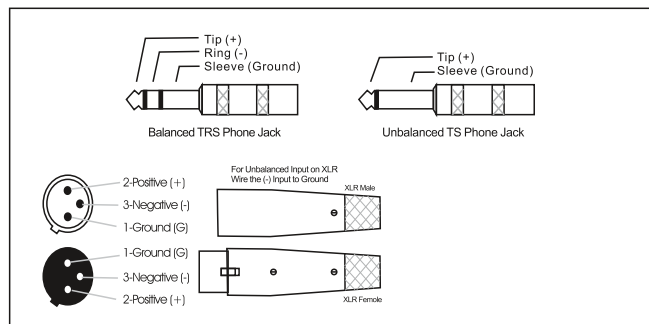
## Connectors & Cables

Your equalizer is provided with two different connector types:

1. 1/4 inch stereo phone jacks (TRS)
2. Three pin XLR type connectors

These connectors will allow interfacing to most professional audio products. Inputs as well as servo-balanced outputs can be used balanced or unbalanced. When possible, balanced connections are recommended between all components in

These connectors will allow interfacing to most professional audio products. Inputs as well as servo-balanced outputs can be used balanced or unbalanced. When possible, balanced connections are recommended between all components in your system, as this eliminates ground-loop induced hum and noise.

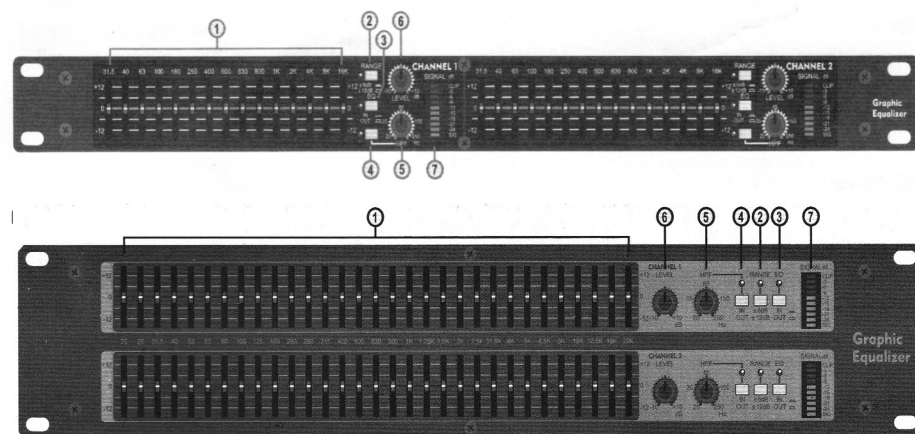


## Unbalanced Connections and Grounding

If you must use unbalanced connectors, the negative lead of the connector should be tied to the ground lead. Using unbalanced connections could result in chassis ground-loop noise. Altering the signal/chassis ground relationship in equipment connected to you may eliminate the noise.

## Physical Description

### Front Panel

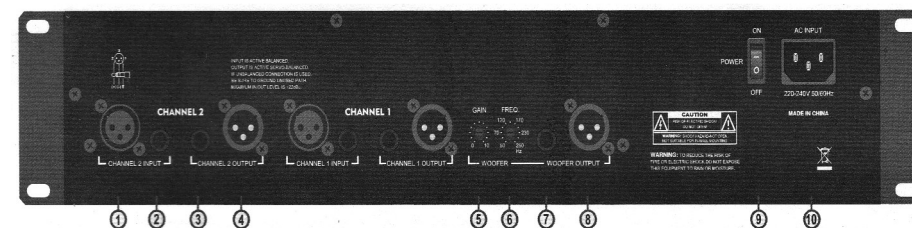


### Input Controls:

Front panel controls for channel 1 and channel 2 are identical.

- ① Equalization - Each channel has 10 frequency sliders, each with a range from -12 dB to +12 dB. By adjusting a combination of sliders, a desired frequency response can be achieved. The physical response of the sliders will give an approximate visual indication of this response.
- ② This switch selects the operating range for the input equalization faders between 12dB and 6dB. The 12dB setting is used for most applications. The 6dB setting allows finer resolution on the fader settings.
- ③ This switches the Graphic Equalization and gain adjustments, allowing the effect of any equalization to be compared.
- ④ The high-pass filter can be used to supplement the frequency response achieved by the bandpass filters. Its function is to eliminate subsonic interference like wind noise or floor rumble. The high-pass frequency is determined by the frequency selection control.
- ⑤ High-pass filter frequency selection control.
- ⑥ Input level control with range from -10 to +10 dB. The control is centre-detented at unity gain (0 dB).
- ⑦ LED peak meter with separate signal present and clip LEDs. The clip LED indicates that the signal level is within 1 dB of clipping.

### Rear Panel



Rear panel connections for channel 1 are described those for channel 2 are identical.

- ① Channel 1 balanced input - female XLR. For unbalanced inputs, the signal should be on the + connection and the - connection tied to ground.
- ② Channel 1 balanced input - 6.35 mm TRS jack. A mono 6.35 mm TRS jack used as an unbalanced connection will automatically be grounded.
- ③ Channel 1 balanced output - 6.35 mm TRS jack.
- ④ Channel 1 balanced output - male XLR. This output circuit is an active output which maintains a constant output level between the (+) and (-) output terminals, regardless of either terminal being connected to ground. This servo-balanced output provides an unchanged signal without regard to ground.
- ⑤ Adjust the woofer channel output level.
- ⑥ Woofer channel frequency selection control.
- ⑦ Woofer channel balanced output - 6.35 mm TRS jack.
- ⑧ Woofer channel balanced output - male XLR. This output circuit is an active output which maintains a constant output level between the (+) and (-) output terminals, regardless of either terminal being connected to ground. This servo-balanced output provides an unchanged signal without regard to ground.
- ⑨ A "POWER" switch of the rocker type applies power to the unit.
- ⑩ IEC receptacle for AC mains.



## Installation

Use four screws and washers when rack mounting the Equalizer. For mobile use, the unit should be further secured as

### General Requirements

Equalizers have specific physical, electrical and signal requirements for proper operation. These requirements will vary depending on your specific application, setup, and the settings on the Equalizer. When setting up and testing your system, please take special care to double check all connections and settings. Please refer to the specifications section of this manual for specific input, output and other figures.

### AC Power

Your equalizer should be connected to a standard 3-wire grounded electrical outlet supplying 220-240 Volts, 50-60 Hz. To reduce the risk of ground loop hum, connect all audio equipment to the same electrical power source. Do not remove the AC plug ground pin, as a potential shock hazard could result.

This unit will perform normally within the AC voltage range specified above. Voltages less than this, as found in “brown-out” conditions, may reduce performance. No user serviceable parts are inside the chassis. Refer all servicing to qualified service personnel. Overall power consumption is less than 15 watts.

**NOTE:** The power switch does NOT isolate the appliance from mains. Make sure the mains power socket or an alternative disconnect device is near by and easily accessible. When the product is connected to mains, the line-filter and the input of the fuse are energized.

## Typical Applications

The following information will help you make the most of your new equalizer:

### General Tone Control

The graphic equalizer is a very useful device for general tone shaping because it is intuitive and easy to adjust. The visual reference provided by the slider position gives an approximate idea of the frequency response generated, with the lower frequencies on the left and higher frequencies on the right. To use the power of an equalizer effectively, you need to translate your idea of the tone you want to produce into a range of numerical frequencies. This is simple after a little practice. Here are a few references which are useful for starting points:

- Very low bass (the “wind” in a kick drum, almost felt as much as heard) -40Hz-80Hz.
- The low register of a male voice - 200Hz
- The low register of a female voice - 350Hz
- Lower midrange (“warmth” frequencies) - 400Hz-1KHz
- Upper midrange (“harshness”, snare drum “bite”, “hot” sound) -2.5KHz-4KHz.
- Sibilance (“sss” sounds, cymbal “sizzle”) - 8KHz-15KHz.

Try using these starting points as a guide when you want more or less of these types of sounds. Adjust by ear from there. It is always a good idea to remember that a little equalization usually works out much better than a lot, and that there are many audio problems which can not be solved with equalization alone.

### Feedback Control

A graphic equalizer can be used to provide some control over moderate feedback problems, but does not have enough flexibility or resolution to handle severe situations. You will achieve the best results when you can eliminate one or two feedback points by setting one or two sliders for no more than a 6dB cut. Often you can find a feedback point by boosting sliders in succession to determine which frequency ranges contain the feedback modes, and then cutting those ranges. Be very careful in this process to avoid explosive feedback and possible system and hearing damage. If you find feedback points with many equalizer bands, cutting every band may not help (all you will do is reduce system gain). The combination of a graphic equalizer for tone control and a parametric equalizer for feedback control is highly recommended.

## Console Channel Equalization

Many mixing consoles provide only simple equalization for individual channels. If your console has channel inserts, you can patch your graphic equalizer into a channel requiring more precise equalization.

### Large Room Equalization

Large rooms tend to suffer from multiple reflections with long time delays, long reverberation times, and “ringmodes”, all of which lead to reduced intelligibility and a generally “muddy” sound. As sound travels long distances through the air, high frequencies are attenuated more than low frequencies. In general, large rooms benefit from some low frequency roll-off, high frequency boost, and attenuation of ring mode frequencies. As in the case of feedback control, a graphic equalizer can help reduce an isolated ring-mode or two, but a tunable narrow-band equalizer such as a parametric is more effective here.

## Specifications

Specification	
Type	Active Balanced
Impedance	20K $\Omega$
Max Level	+23dBu
Connectors	1/4" Phone Jack (TRS), XLR
Output	
Type	Same-Balanced
Source Impedance	100 $\Omega$
Min Load Impedance	200 $\Omega$
Max Level	+23 dBu
Connectors	1/4" Phone Jack (TRS), XLR
Overall	
Frequency Response	31.5Hz-16kHz $\pm 0.25$ dB
THD	< 0.1% @ +20dBu
IMD Distortion (SMPTE)	< 0.1% @ +20dBu
Output Hum & Noise (unweighted)	94dBu
Channel Separation	> 85dB @ 1kHz
Gain Control	-10 to +10dB
Filters	
Type	Constant Q/Wein Bridge
Number	15
Bandwidth	1/3 Octave
Tolerance	$\pm 3\%$
Range	$\pm 6$ dB, $\pm 12$ dB (switchable)
Subsonic Filter	18dB/Octave @ 20-250Hz
Power Requirements	
Nominal Voltage	220-240 VAC(50-60Hz)
Minimal Voltage	200 VAC
Power	15W