



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 a circle and triangle is intended to alert the user to the presence of an unshielded "live" or "energized" area within the product's enclosure that may be of sufficient magnitude to cause a risk of electric shock or burns. The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operational, maintenance, or safety instructions in the literature accompanying the device.

La parola di oggi è **disagio** (o **disagio**), che significa disagio, spiacere, ma anche un disagio economico, il malcontento o il malumore dei lavoratori del settore che non hanno un lavoro sicuro. Il disagio, infatti, può anche essere un disagio del tipo di disagio economico per le aziende. La parola di oggi, insomma, è **disagio**, che significa disagio, ma anche un disagio economico, il malcontento o il malumore dei lavoratori del settore che non hanno un lavoro sicuro. La parola di oggi, insomma, è **disagio**, che significa disagio, ma anche un disagio economico, il malcontento o il malumore dei lavoratori del settore che non hanno un lavoro sicuro.

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 obstruct 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 polarization on grounding-type plug. A polarized plug fits into the outlets with one of the two flat blades in the correct orientation. A nonpolarized plug fits into the outlets in either orientation. Grounding-type plugs have the third blade that is longer than the other two blades. This design is for your safety. If the provided plug does not fit into your outlet, consult a qualified 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 the cord exits from the apparatus.
12. Only use attachments/accessories specified by the manufacturer.
13. Unplug from the outlet stand by trip breaker, outlet specified by the manufacturer, consult with the apparatus. When a cord is used, use caution when moving the cord/appliances to avoid injury from the cord.
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 the power supply cord or plug is disconnected, objects have fallen inside the apparatus, liquid has been spilled into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been damaged.

1. Lisez les instructions.
2. Consolidez les instructions.
3. Consolidez les vérifications.
4. Soyez sûr de vous-même.
5. Pour vérifier le statut de la ou des tâches à évaluer, ne vous appuyez pas spécialement pour prouver ou flatter.
6. Vérifiez les tâches spécialement pour vous.
7. Le travail est la base d'un bon travail.
8. Ne pas oublier les avantages de vos tâches, surtout avant de commencer à travailler.
9. Écrivez des notes de tâches et des tâches, pour vous aider à vous souvenir de la tâche.
10. Ne pas modifier ou copier le système de la tâche à l'école. Une tâche peut être à l'école, mais on ne peut pas la copier et la modifier. Si la tâche n'est pas à l'école, on ne peut pas la modifier, car on ne peut pas la copier et la modifier.
11. Préparez le contenu de la tâche, car on ne peut pas la modifier et la copier, car on ne peut pas la modifier et la copier.
12. Ne pas oublier les tâches recommandées par le système.
13. Ne pas oublier les tâches recommandées par le système.
14. Ne pas oublier les tâches recommandées par le système.
15. Ne pas oublier les tâches recommandées par le système.
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19. Ne pas oublier les tâches recommandées par le système.
20. Ne pas oublier les tâches recommandées par le système.

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 the equipment does cause 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.

Introduction

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

- Silent In-Circuit Switching
- Signal Present and Chip LEDs
- Precision Wide-Band Filters
- Offset Free
- Constant "Q" Design
- Switchable Low-Cut Filter
- Selectable 12dB to 60dB Range
- Balanced XLR, 3" Inputs
- Stereo-Balanced XLR, 5" 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 unisolated "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 are "Q" enhanced Wein bridge filters and interleaved summing for constant "Q", low ripple, and minimum fiber interaction. A servo-balanced output stage simulates a true transformer output to allow interfacing with virtually any type of load.

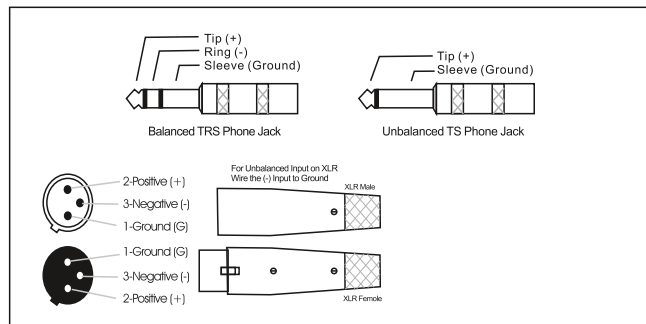
Connectors & Cables

Your analyzer is provided with two different connector types:

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

These connectors will allow interfacing to most professional audio products. Inputs as well as stereo-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.

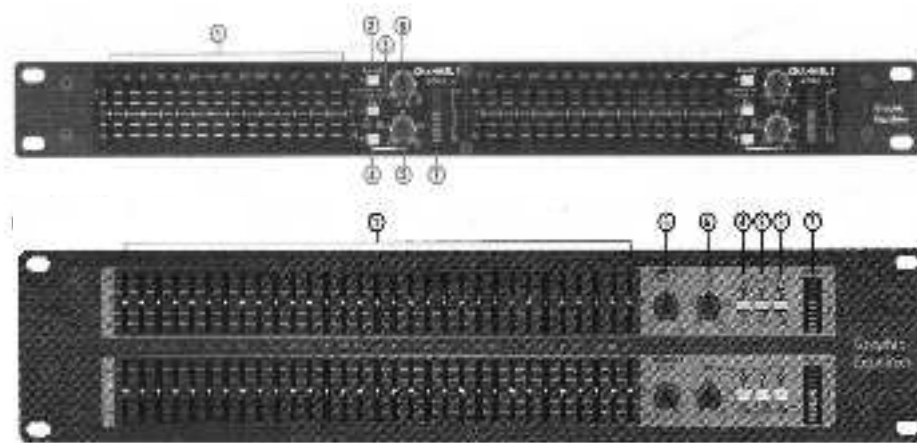


Unbalanced Connections and Grounding

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 your may eliminate the noise.

Physical Description

Front Panel

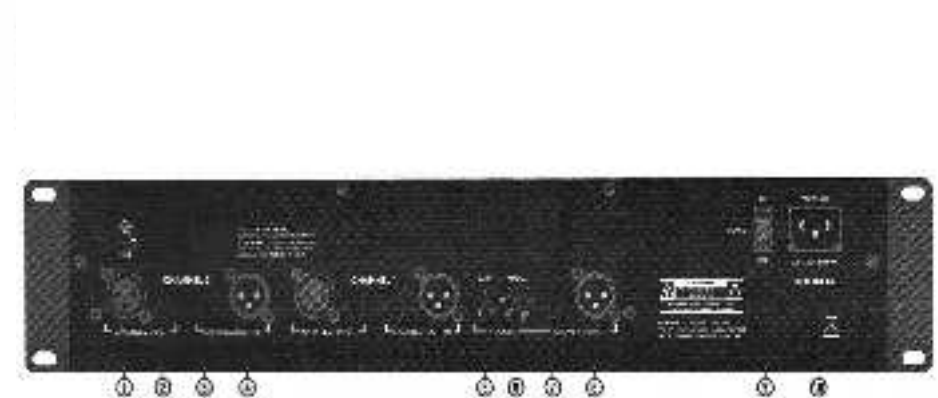


Input Controls:

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

- ① Equalization - The two channel equalization controls adjust the high and low end of the frequency response. There are 18 dB of boost/cut per channel. By adjusting a combination of the two, a flat response may be achieved. The response of the two channels will give an approximate visual indication of the response.
- ② This switch selects the operating range of the two channel equalization faders between 12dB and 6dB. The 12dB 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 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, ratchet felt as much as heard) - 40Hz-50Hz.
- The low register of a male voice - 200Hz.
- The low register of a female voice - 350Hz.
- Lower midrange ("warmth") frequencies - 400Hz-1KHz.
- Upper midrange ("hardness", 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 flexible narrow band equalizer such as a parametric is more effective here.

Specifications

Specification	
Type	Active Balanced
Impedance	20K Ω
Max Level	+23dBu
Connectors	1/4" Phone Jack (TRS), XLR
Output	
Type	Stereo-Balanced
Source Impedance	100 Ω
Min Load Impedance	200 Ω
Max Level	+23 dBu
Connectors	1/4" Phone Jack (TRS), XLR
Overall	
Frequency Response	31.5Hz-18kHz, ± 0.25 dB
THD	<0.1% @ +20dBu
IM 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	16
Bandwidth	1/3 Octave
Tolerance	$\pm 8\%$
Range	± 6 dB, ± 12 dB (switchable)
Subsonic Filter	18dB/Octave @ 20-250Hz
Power Requirements	
Nominal Voltage	220-240 VAC(50-60Hz)
Minimal Voltage	200VAC
Power	15W