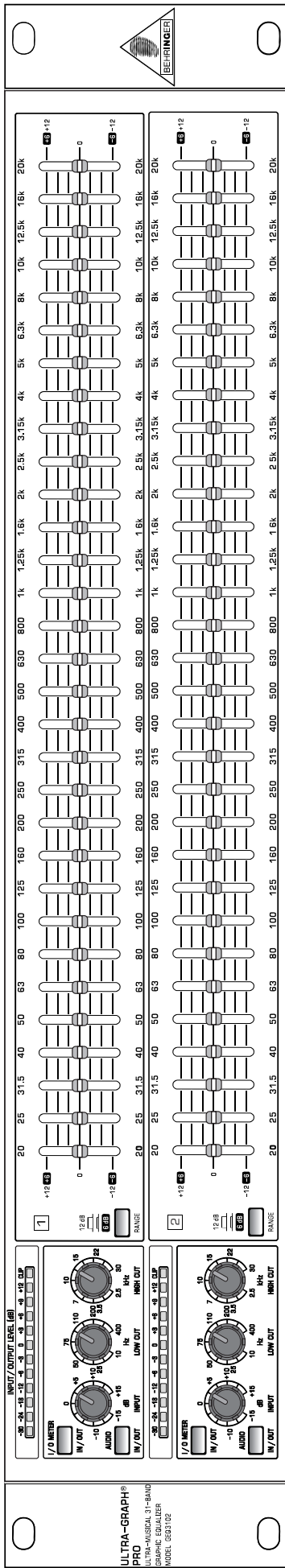


# ULTRA-GRAPH<sup>®</sup> PRO GEQ3102



## User's Manual

Version 1.1 July 2000

ENGLISH



## SAFETY INSTRUCTIONS

**CAUTION:** To reduce the risk of electric shock, do not remove the cover (or back). No user serviceable parts inside; refer servicing to qualified personnel.



**WARNING:** To reduce the risk of fire or electric shock, do not expose this appliance to rain or moisture.



This symbol, wherever it appears, alerts you to the presence of uninsulated dangerous voltage inside the enclosure - voltage that may be sufficient to constitute a risk of shock.



This symbol, wherever it appears, alerts you to important operating and maintenance instructions in the accompanying literature. Read the manual.

### DETAILED SAFETY INSTRUCTIONS:

All the safety and operation instructions should be read before the appliance is operated.

#### **Retain Instructions:**

The safety and operating instructions should be retained for future reference.

#### **Heed Warnings:**

All warnings on the appliance and in the operating instructions should be adhered to.

#### **Follow instructions:**

All operation and user instructions should be followed.

#### **Water and Moisture:**

The appliance should not be used near water (e.g. near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool etc.).

#### **Ventilation:**

The appliance should be situated so that its location or position does not interfere with its proper ventilation. For example, the appliance should not be situated on a bed, sofa rug, or similar surface that may block the ventilation openings: or placed in a built-in installation, such as a bookcase or cabinet that may impede the flow of air through the ventilation openings.

#### **Heat:**

The appliance should be situated away from heat sources such as radiators, heat registers, stoves, or other appliances (including amplifiers) that produce heat.

#### **Power Source:**

The appliance should be connected to a power supply only of the type described in the operating instructions or as marked on the appliance.

#### **Grounding or Polarization:**

Precautions should be taken so that the grounding or polarization means of an appliance is not defeated.

#### **Power-Cord Protection:**

Power supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords and plugs, convenience receptacles and the point where they exit from the appliance.

#### **Cleaning:**

The appliance should be cleaned only as recommended by the manufacturer.

#### **Non-use Periods:**

The power cord of the appliance should be unplugged from the outlet when left unused for a long period of time.

#### **Object and Liquid Entry:**

Care should be taken so that objects do not fall and liquids are not spilled into the enclosure through openings.

#### **Damage Requiring Service:**

The appliance should be serviced by qualified service personnel when:

- The power supply cord or the plug has been damaged; or
- Objects have fallen, or liquid has been spilled into the appliance; or
- The appliance has been exposed to rain; or
- The appliance does not appear to operate normally or exhibits a marked change in performance; or
- The appliance has been dropped, or the enclosure damaged.

#### **Servicing:**

The user should not attempt to service the appliance beyond that which is described in the Operating Instructions. All other servicing should be referred to qualified service personnel.

## FOREWORD

Dear Customer,

Welcome to the team of ULTRA-GRAPH PRO users and thank you very much for expressing your confidence in BEHRINGER products by purchasing the GEQ3102.

It is one of my most pleasant tasks to write this letter to you, because it is the culmination of many months of hard work delivered by our engineering team to reach a very ambitious goal: making an outstanding device that will become a standard tool used by studios and P.A. companies. The task to design the ULTRA-GRAPH PRO certainly meant a great deal of responsibility, which we assumed by focusing on you, the discerning user and musician. It also meant a lot of work and night shifts to accomplish this goal. But it was fun, too. Developing a product usually brings a lot of people together, and what a great feeling it is when everybody who participated in such a project can be proud of what we've achieved.

It is our philosophy to share our joy with you, because you are the most important member of the BEHRINGER family. With your highly competent suggestions for new products you've greatly contributed to shaping our company and making it successful. In return, we guarantee you uncompromising quality (manufactured under ISO9000 certified management system) as well as excellent technical and audio properties at an extremely favorable price. All of this will enable you to fully unfold your creativity without being hampered by budget constraints.

We are often asked how we can make it possible to produce such high-grade devices at such unbelievably low prices. The answer is quite simple: it's you, our customers! Many satisfied customers, mean large sales volumes enabling us to get better conditions of purchase for components, etc. Isn't it only fair to pass this benefit back to you? Because we know that your success is our success too!

I would like to thank all people whose help on "Project ULTRA-GRAPH PRO" has made it all possible. Everybody has made very personal contributions, starting from the designers of the unit via the many staff members in our company to you, the user of BEHRINGER products.

My friends, it's been worth the trouble!

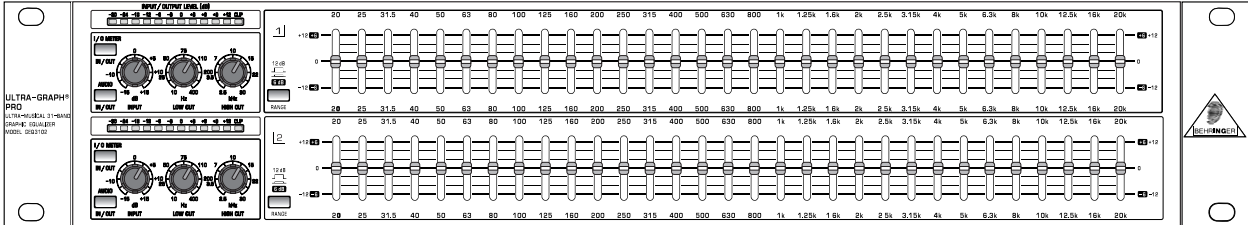
Thank you very much,

A handwritten signature in black ink, appearing to read 'U. Behringer', with a long horizontal flourish extending to the right.

Uli Behringer

# ULTRA-GRAPH PRO

## Ultra-musical 31-Band Stereo Graphic Equalizer




- ▲ Delivers outstanding equalization both in live applications and in the studio
- ▲ For gentle contouring and audio sweetening in audio post-production and recording studios
- ▲ Perfectly suited for room equalization and extreme corrective surgery e.g. notching out unwanted frequencies (feedback etc.)
- ▲ 2 x 31 ISO frequencies controllable via slide controls with boost/cut range switchable from 12 dB to 6 dB
- ▲ Additional sweepable High and Low Cut filters remove unwanted frequencies e.g. floor rumble and tape hiss etc.
- ▲ Servo-balanced inputs and outputs on gold-plated XLR and 1/4" jack connectors
- ▲ Relay-controlled hard-bypass with an auto-bypass function during power failure (failsafe relay)
- ▲ Ultra-low noise audio operational amplifiers offer outstanding sound performance
- ▲ High-precision illuminated ALPS faders
- ▲ Accurate 12-segment LED input/output metering for easy level setting
- ▲ High-quality detented potentiometers and illuminated switches
- ▲ High-grade toroidal transformer for a minimum of interference
- ▲ High-quality components and exceptionally rugged construction ensures long life
- ▲ Manufactured under ISO9000 certified management system

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## 1. INTRODUCTION

Thank you very much for expressing your confidence in BEHRINGER products by purchasing the ULTRA-GRAPH PRO GEQ3102. With the ULTRA-GRAPH PRO you have acquired an extremely musical and flexible 31-band Graphic Equalizer. This 2-channel high-end EQ is based on many years of experience and know-how gathered in filter technology. Our analog and digital equalizers are used throughout the world in renowned studios, sound reinforcement systems and broadcast/TV stations. The BEHRINGER ULTRA-GRAPH PRO was designed to meet the most stringent requirements in terms of operation, sound, specifications and workmanship.

 **This manual first describes the terminology used, so that you can fully understand the ULTRA-GRAPH PRO and its functions. Please read the manual carefully and keep it for future reference.**

### 1.1 The design concept

The philosophy behind BEHRINGER products guarantees a no-compromise circuit design and employs the best choice of components. The operational amplifiers which are used in the ULTRA-GRAPH PRO, are exceptional. They boast extreme linearity and very low distortion characteristics. To complement this design the choice of components includes high tolerance resistors and capacitors, detent potentiometers and several other stringently selected elements.

The ULTRA-GRAPH PRO uses SMD technology (Surface Mounted Device). These subminiature components adapted from aerospace technology allow for an extreme packing density to further improve the overall reliability. Additionally, the unit is manufactured in compliance with the ISO9000 certified management system.

Fail-safe relays have been incorporated into the design of the BEHRINGER ULTRA-GRAPH PRO. These automatically and silently bypass the unit in the event of power supply disconnection or failure. These relays are also active at power-on to isolate the unit from potentially damaging power-on thump.

### 1.2 Before you begin

Your BEHRINGER ULTRA-GRAPH PRO was carefully packed in the factory and the packaging is designed to protect the unit from rough handling. Nevertheless, we recommend that you carefully examine the packaging and its contents for any signs of physical damage, which may have occurred during transit.

 **If the unit is damaged, please do not return it to BEHRINGER, but notify your dealer and the shipping company immediately, otherwise claims for damage or replacement may not be granted. Shipping claims must be made by the consignee.**

The BEHRINGER ULTRA-GRAPH PRO fits into two standard 19" rack units of space. Please allow at least an additional 4" depth for the connectors on the back panel.

Be sure that there is enough space around the unit for cooling and please do not place the ULTRA-GRAPH PRO on high temperature devices such as power amplifiers etc. to avoid overheating.

 **Before you connect your ULTRA-GRAPH PRO to the mains, please make sure that your local voltage matches the voltage required by the unit!**

The mains connection of the ULTRA-GRAPH PRO is made by using the enclosed mains cable and a standard IEC receptacle. It meets all of the international safety certification requirements.

 **Please make sure that all units have a proper ground connection. For your own safety, never remove or disable the ground conductor of the unit or of the AC power cable.**

As standard, the BEHRINGER ULTRA-GRAPH PRO is installed with electronically servo-balanced inputs and outputs. The circuit design features automatic hum rejection for balanced signals, permitting trouble-free operation even at the highest operating levels. Externally induced power-line hum, etc. is thus suppressed effectively. The automatic servo function recognizes the presence of unbalanced connectors and adjusts the nominal level internally to avoid level differences between the input and output signals (6 dB correction).

You will find additional information in chapter 4 “INSTALLATION”.

### 1.3 Control elements

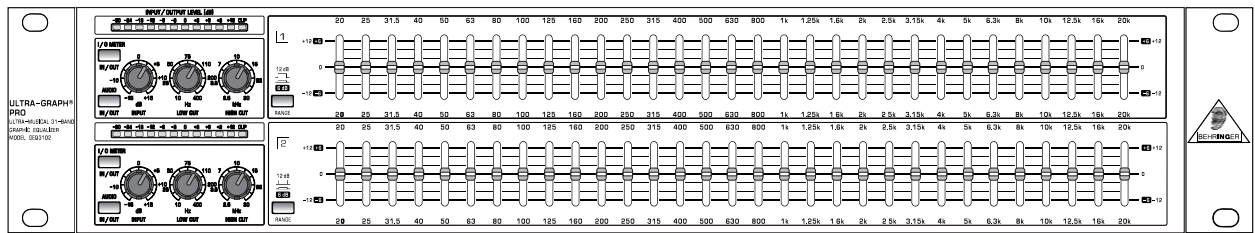


Fig. 1.1: The front panel of the ULTRA-GRAPH PRO

The front panel of the BEHRINGER ULTRA-GRAPH PRO features six controls, six switches and 2 x 31 slide controls. Additionally, the GEQ3102 is equipped with two 12-digit LED meters. As all control elements are the same on both channels, this chapter deals with one channel only.

#### 1.3.1 The front panel

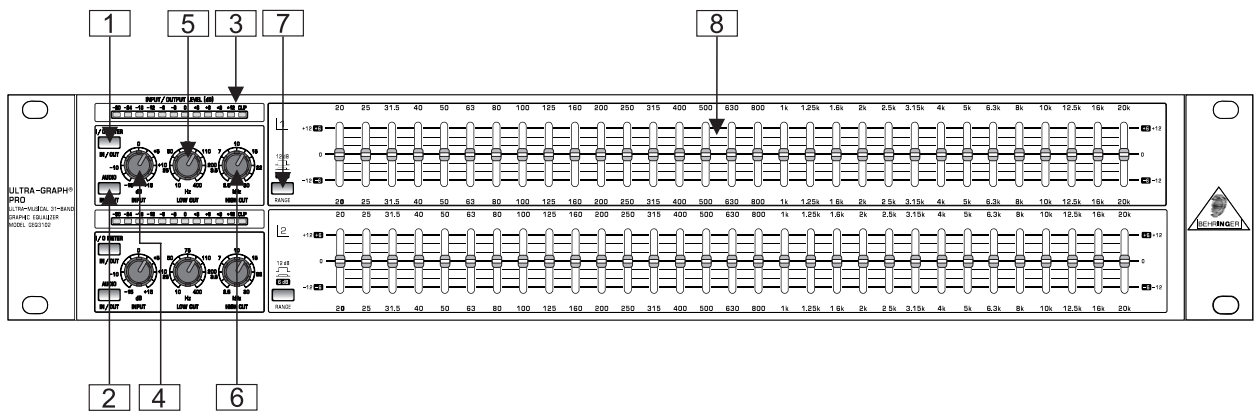



Fig. 1.2: The front panel control elements

- 1 Use the *I/O METER IN/OUT* switch to toggle the meter between input and output level. When the switch is pressed, the ULTRA-GRAPH PRO displays the output level.
  - 2 The *AUDIO IN/OUT* switch enables/disables the entire Equalizer section in the audio path. As this is a relay-controlled hard-bypass circuit, the inputs/outputs are directly connected as soon as the switch is released or the unit is switched off. Use the *AUDIO IN/OUT* switch to make *A/B* comparisons between direct and processed signals.
  - 3 The *LEVEL METER* monitors the signal level to warn you of distortion. Depending on the setting of the *I/O METER IN/OUT* switch, this meter reads the input or output level (switch pressed). The red *CLIP* LED lights up at about +18 dB, i.e. 3 dB below clipping.
-  **Please note that extreme frequency boost in combination with high input levels can lead to distortion. In this case, it will be necessary to reduce the input level with the INPUT control.**
- 4 The *INPUT* control adjusts the input level within a range from -15 to +15 dB.
  - 5 The *LOW CUT* control determines the lower cutoff frequency of the ULTRA-GRAPH PRO. The high pass filter (18 dB/oct.) can be set from 10 through 400 Hz, in position “10 Hz” the signal passes unaffected.
  - 6 The *HIGH CUT* control adjusts the upper cutoff frequency of the ULTRA-GRAPH PRO. The low pass filter (18 dB/oct.) can be set from 2.5 through 30 kHz, in position “30 kHz” the signal passes unaffected.

- ☞ Use the high and low cut filters as highly efficient tools to limit the frequency range to be processed.
- 7 The *RANGE* switch allows you to switch over between maximum boost/cut in each frequency band, from 12 dB to 6 dB (switch pressed).
- 8 These are the 31 *SLIDE CONTROLS* for each frequency band. If set to flat ("0"), there is no frequency response processing. To boost/cut a specific frequency move the corresponding slide control upwards or downwards respectively.

### 1.3.2 The rear panel

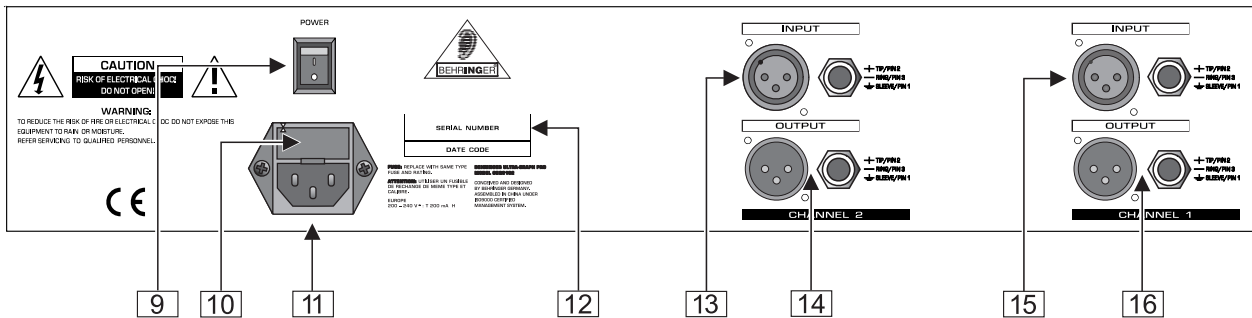


Fig. 1.3: The rear panel connectors

- 9 Use the *POWER* switch to turn on the ULTRA-GRAPH PRO.
- 10 *FUSE HOLDER / VOLTAGE SELECTOR*. Please make sure that your local voltage matches the voltage indicated on the unit, before you attempt to connect and operate the ULTRA-GRAPH PRO. Blown fuses may only be replaced by fuses of the same type and rating. Some models allow for inserting the fuse holder in two different positions, in order to switch over from 230 V to 115 V operation, and vice versa. Please note that for 115 V operation outside Europe, you need to use a fuse of a higher rating (see chapter 4 "INSTALLATION").
- 11 Use the enclosed power cord to connect the unit to the mains.
- 12 *SERIAL NUMBER*. Please take the time to have the warranty card filled out completely by your specialized dealer, and return it within 14 days after the date of purchase, so as to be entitled to benefit from our extended warranty. Or use our online registration option available on the Internet at [www.behringer.com](http://www.behringer.com).
- 13 *AUDIO IN - CHANNEL 2*. These are the ULTRA-GRAPH PRO's balanced 1/4" jack and XLR audio inputs.
- 14 *AUDIO OUT - CHANNEL 2*. These are the audio outputs of the ULTRA-GRAPH PRO. The jack and XLR plugs of each channel are wired in parallel.
- 15 *AUDIO IN - CHANNEL 1*. These are the ULTRA-GRAPH PRO's balanced 1/4" jack and XLR audio inputs.
- 16 *AUDIO OUT - CHANNEL 1*. These are the audio outputs of the ULTRA-GRAPH PRO. The jack and XLR plugs of each channel are wired in parallel.

## 2. APPLICATIONS

The flexible concept behind the BEHRINGER ULTRA-GRAPH PRO, with its great variety of audio processing features, opens up a whole new world of applications. We'd like to present you with a few examples in the following plus some typical settings.



## 2.1 Master equalizer in sound reinforcement systems

This is the ULTRA-GRAPH PRO's probably most common field of application.

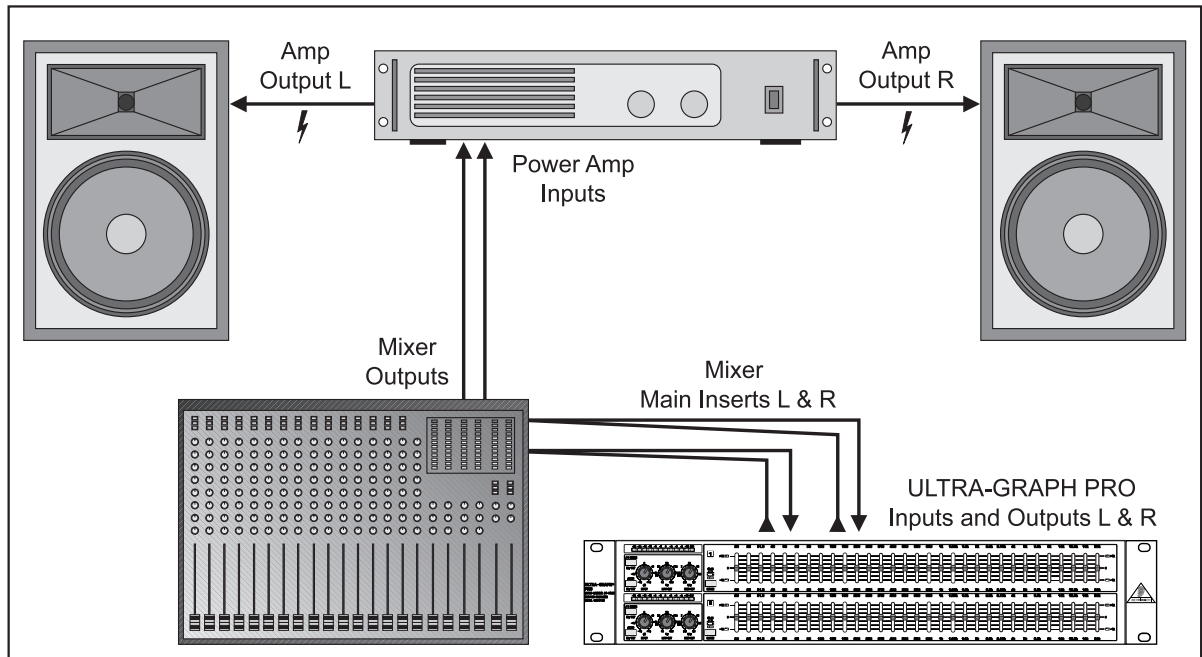


Fig. 2.1: The ULTRA-GRAPH PRO as a master equalizer

Please note the following points to achieve optimum results:

Practice has shown that it will be useful to listen to some “unprocessed” music and speech material before you start equalizing your sound reinforcement system. If any distortion can be heard, try to eliminate it within the system. Speaker placement is also of importance. No equalizer can improve a system sound that lacks transparency due to reflections from walls and ceiling. Often, drastic improvements can be achieved by modifying speaker placement and alignment.


If you are using an active multi-way system you should take some run-time and phase correction measures before you work with the ULTRA-GRAPH PRO (the crossover network BEHRINGER SUPER-X PRO CX3400 provides all the necessary tools with its variable split frequencies, phase reverse switches and electronic run-time correction facility). Interference such as mains hum and narrow-band resonance should be eliminated with the ULTRA-GRAPH PRO, before you start doing a sound check.

Once this basic setting has been made, you can continue to fine-tune the system by hand.


### Please remember:

A linear response curve is not desirable for all kinds of application. For example, intelligibility is more important in speech applications: here, you should apply a slight roll-off in the bass range, because below the frequency range of voices there are no wanted frequencies but only interference (rumble, etc.).

In general, extremely low and high frequencies are transmitted with much lower amplitudes. There is no sense in “forcing” a small full-range speaker to reproduce frequencies below 50 Hz; apart from a need for higher power reserves, speaker damage will be the most likely result.

 **You should always take the physical limits of your system into account, no matter which settings you choose.**

Once the system has been adjusted as precisely as possible to produce the desired response curve, you should walk around the room to get an impression of the sound produced in various places. Remember to make regular breaks during these listening tests and to play back various music and speech programs, so that you get a feel for the response characteristics of your system and of the room.

 **Good equalizer settings require time and patience! If you need to use extreme EQ settings to achieve an acceptable frequency response, the reason might be some serious misalignment of sound reinforcement system or room acoustics.**

Equalizers cannot make up for poor audio systems, but they are extremely useful and efficient tools for making musical fine-adjustments, as this often produces astounding improvements in terms of acoustic power and overall sound quality.

## 2.2 Equalizer in the monitor path

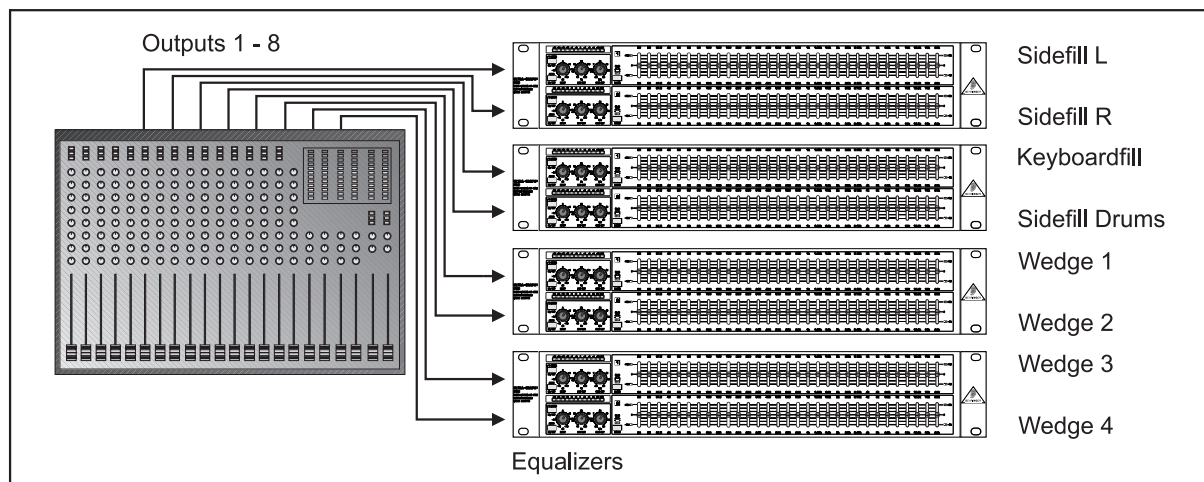
To use the ULTRA-GRAPH PRO in the monitor path, you should basically follow the same procedure as described in section 2.1.

On stage, you should keep volume levels as low as possible, because:

1. this will protect your ears,
2. avoid feedback problems, and
3. make it easier to create a well-balanced FOH sound.

Often, the volume of the monitors is raised during concerts. Use concert pauses to reduce the levels of all monitor paths by about 3 dB. The musicians on stage will hardly notice this reduction (or even not at all), because their hearing, too, can relax a bit during the break. This method will give you valuable headroom.

Extremely low frequencies are usually faded out completely, to avoid a stage sound that lacks transparency due to low frequency feedback. Apply the low cut filter until extremely low-end feedback frequencies are eliminated and the overall transparency of the monitors is improved.



*Fig. 2.2: Several ULTRA-GRAPH PRO's as part of a monitor system*

This illustration gives you an example of how to use several ULTRA-GRAPH PRO's in an 8-way monitor system.

### 2.2.1 "Tuning in" of a monitor system

"Tuning in" describes the process of detecting and suppressing feedback frequencies. Once all microphones and monitor speaker (plus power amps) have been set up and adjusted, you should turn up all Aux Send controls in those channels of your console that you will need for the monitor mix. Then, turn up the master Aux Send control until the first feedback occurs. Turn the control down a bit and leave it where there is no feedback. Now turn up the single slide controls on your ULTRA-GRAPH PRO, one after the other. Whenever feedback occurs, set the slide control of the respective frequency range to maximum cut. When there is no feedback, leave the control in mid-travel position. Finally, you can turn up the master Aux Send control without running the risk of audible feedback.

## 2.3 Using the ULTRA-GRAPH PRO in the studio

In the studio you can use your ULTRA-GRAPH PRO in a variety of further applications. Your imagination is the only limit. Here are just a few examples:

### Equalizing monitoring speakers:

You can graphically equalize your monitoring speakers. Additionally, narrow-band room resonance frequencies can be suppressed with the ULTRA-GRAPH PRO. An analyzer (for example, the one integrated in our digital Equalizer ULTRA-CURVE PRO DSP8024) helps you identify room resonance and produce a linear frequency response.

### General sound processing:

Equalizers can be used to process both single-channel and master signals. To process a single signal, you should use the channel insert point on your console to connect the ULTRA-GRAPH PRO. To control several signals, use either a Subgroup or Main Mix insert point. In particular, mastering studios frequently work with Equalizers to refine the sound of a finished mix. Often, the mix lacks balance, i.e. some frequencies are too loud or cannot be heard at all. With a Graphic Equalizer you can align the differing amplitudes of frequency ranges to create a homogenous sound image.

Chapter 3 ("THE SOUND TOOL") provides useful information on how to process typical frequency ranges of voices and instruments.

## 3. THE SOUND TOOL

In recording studios as well as stage or radio plays, the ULTRA-GRAPH PRO will be your valuable sound tool to modify the sound of voices (e.g. telephone voice) or to filter instruments so that they fit in an existing mix.

The tables on the following pages give you an idea of specific frequencies and their acoustic significance, and suggest some possible uses of your ULTRA-GRAPH PRO.

### 3.1 Effects of equalization on voice program

Center frequency (Hz) 1/3 octave	Effect on voice
40 to 125	Sense of power in some outstanding bass singers.
160 to 250	Voice fundamentals.
315 to 500	Important for voice quality.
630 to 1k	Important for voice naturalness. Too much boost in the 315 to 1 kHz range produces a telephone-like quality.
1.25k to 4k	Voice fricatives-accentuation of vocals. Important for speech intelligibility. Too much boost between 2 and 4 kHz can mask certain speech sounds e.g. "m", "b", and "v" can become indistinguishable. Too much boost anywhere between 1 and 4 kHz can produce "listening fatigue". Vocals can be highlighted by slightly boosting the vocal at 3 kHz and at the same time slightly dipping the instruments at the same frequency.
5k to 8k	Accentuation of voice. The range from 1.25 to 8 kHz governs the clarity of voice.
10k to 16k	Too much boost causes sibilance.

Tab. 3.1: Effects of equalization on voice reproduction

### 3.2 Effects of equalization on music program

Center frequency (Hz) 1/3 octave	Effects on music
31 to 63	Fundamentals of bass drum, tuba, double bass and organ. These frequencies give music a sense of power. If over-emphasised they make the music "muddy". The 50 or 60 Hz band is also used to reject AC mains hum.
80 to 125	Fundamentals of lower tympani. Too much boost produces excessive "boom". 100 or 125 Hz are also used for hum rejection.
160 to 250	Drum and lower bass. Too much boost produces excessive "boom". Also useful for 3rd harmonic mains hum rejection.
315 to 500	Fundamentals of strings and percussion.
630 to 1k	Fundamentals and harmonics of strings, keyboards and percussion. Boosting the 600 to 1 kHz range can make instruments sound horn-like.
1.25k to 4k	Drums, guitar, accentuation of vocals, strings and bass. Too much boost in the 1 to 2 kHz range can make instruments sound tinny. Too much boost anywhere between 1 to 4 kHz can produce "listening fatigue".
5k to 8k	Accentuation of percussion, cymbals and snare drum. Reduction at 5 kHz makes overall sound more distant and transparent. Reduction of tape hiss and system noise. The 1.25 to 8 kHz governs clarity and definition.
10k to 16k	Cymbals and overall brightness. Too much boost causes sibilance. Reduction of tape hiss and system noise.

Tab. 3.2: Effects of equalization on music reproduction

## 4. INSTALLATION

Your BEHRINGER ULTRA-GRAPH PRO was carefully packed in the factory and the packaging is designed to protect the unit from rough handling. Nevertheless, we recommend that you carefully examine the packaging and its contents for any signs of physical damage, which may have occurred during transit.

 **If the unit is damaged, please do not return it to BEHRINGER, but notify your dealer and the shipping company immediately, otherwise claims for damage or replacement may not be granted. Shipping claims must be made by the consignee.**

### 4.1 Rack mounting

The BEHRINGER ULTRA-GRAPH PRO fits into two standard 19" rack units of space. Please allow at least an additional 4" depth for the connectors on the back panel.

Be sure that there is enough space around the unit for cooling and please do not place the ULTRA-GRAPH PRO on high temperature devices such as power amplifiers etc. to avoid overheating.

## 4.2 Mains connection

**Please ensure that the ULTRA-GRAPH PRO is set to the correct supply voltage before connecting the unit to the AC power system!** Three triangular markings can be found on the fuse holder at the AC power connection socket. Two of these three triangles will be aligned with one another. The ULTRA-GRAPH PRO is set to the operating voltage shown next to these markings and can be switched over by twisting the fuse holder by 180°. **IMPORTANT: This does not apply to export models designed only for 115 V AC!**

The mains connection of the ULTRA-GRAPH PRO is made by using the enclosed mains cable and a standard IEC receptacle. It meets all of the international safety certification requirements.

 **Please make sure that all units have a proper ground connection. For your own safety, never remove or disable the ground conductor of the unit or of the AC power cable.**

## 4.3 Audio connections

As standard, the BEHRINGER ULTRA-GRAPH PRO is installed with electronically servo-balanced inputs and outputs. The circuit design features automatic hum rejection for balanced signals, permitting trouble-free operation even at the highest operating levels. Externally induced power-line hum, etc. is thus suppressed effectively. The automatic servo function recognizes the presence of unbalanced connectors and adjusts the nominal level internally to avoid level differences between the input and output signals (6 dB correction).

 **Please ensure that only qualified persons install and operate the ULTRA-GRAPH PRO. During installation and operation the user must have sufficient electrical contact to earth. Electrostatic charges might affect the operation of the ULTRA-GRAPH PRO!**

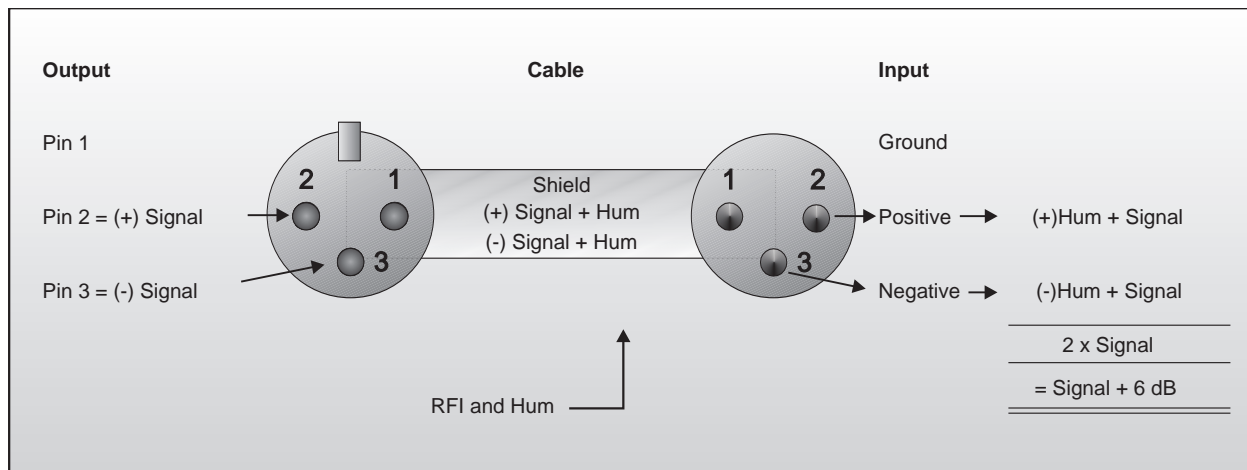


Fig. 4.1: Compensation of interference with balanced connections

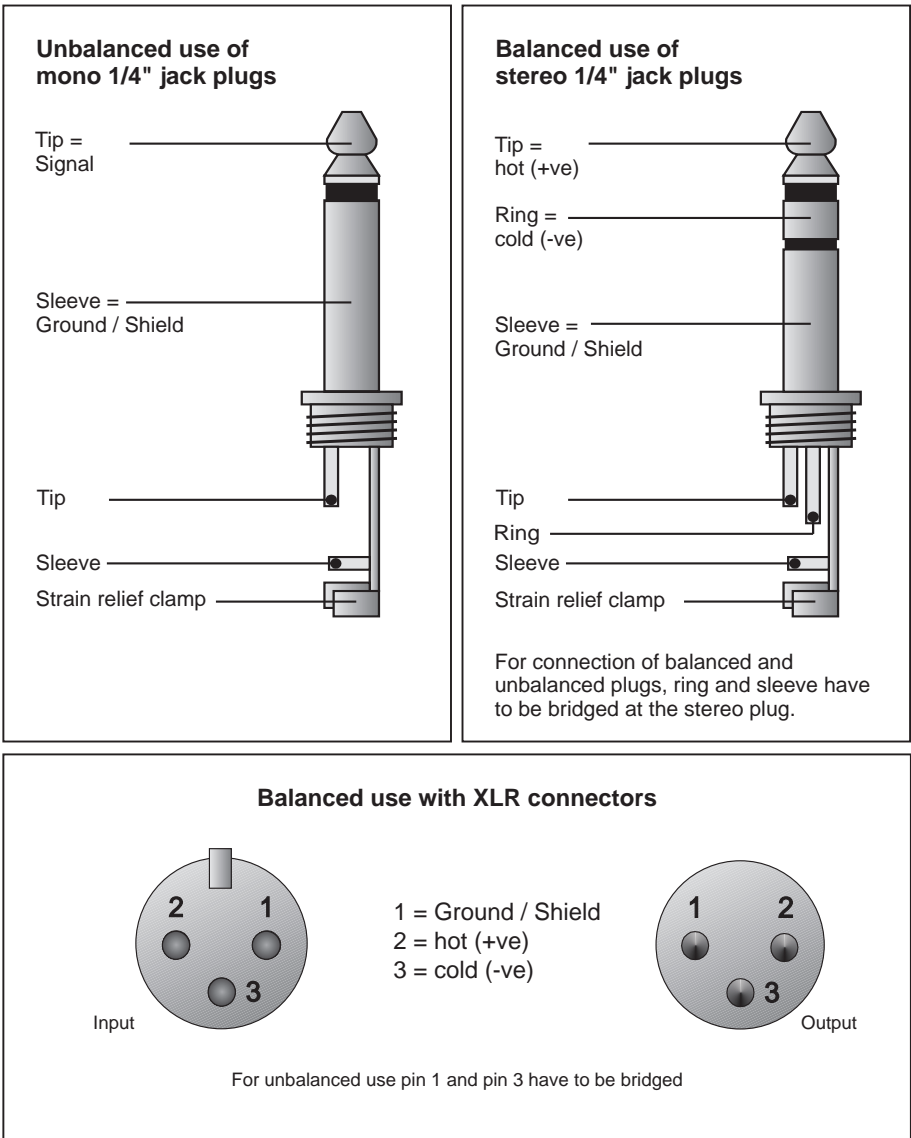


Fig. 4.2: Different plug types

## 5. SPECIFICATIONS

### AUDIO INPUT

Connectors	XLR and 1/4" jack
Type	RF filtered, servo-balanced input
Impedance	50 kOhm balanced, 25 kOhm unbalanced
Max. input level	+21 dBu balanced and unbalanced
CMRR	typ. 40 dB, > 53 dB @ 1 kHz

### AUDIO OUTPUT

Connectors	XLR and 1/4" jack
Type	electronically servo-balanced output stage
Impedance	60 Ohms balanced, 30 Ohms unbalanced
Max. output level	+21 dBu balanced and unbalanced

### SYSTEM SPECIFICATIONS

Frequency response	10 Hz to 35 kHz, +/- 3 dB
Noise	> 92.3 dBu, unweighted, 22 Hz to 22 kHz
THD	0.004 % typ. @ +4 dBu, 1 kHz, Gain 1
Crosstalk	< -85 dB, 22 Hz to 22 kHz

### ROLL-OFF FILTER SECTION

Type	12 dB/oct., butterworth
Input	variable (-15 dB to +15 dB)
Low cut	variable (10 Hz to 400 Hz)
High cut	variable (2.5 kHz to 30 kHz)

### GRAPHIC EQUALIZER

Type	analog 1/3-octave equalizer
Frequency range	20 Hz to 20 kHz in 31 1/3-octave bands (ISO frequencies)
Bandwidth	1/3 octave
Control range	+/- 6 dB or +/- 12 dB (switchable)

### FUNCTION SWITCHES

Audio in/out	switch to bypass the equalizer functions
I/O meter in/out	switches the meter display from input to output
Range	shift of the maximum cut/boost range for all 31 bands

### INDICATORS

Input/output level	12-segment LED display: -30/-24/-18/-12/-6/-3/0/+3/+6/+9/+12/+18 dB
Function switch	LED indicator for every switch

### POWER SUPPLY

Mains voltages	USA/Canada	120 V ~, 60 Hz
	U.K./Australia	240 V ~, 50 Hz
	Europe	230 V ~, 50 Hz
	General export model	100-120 V ~, 200-240 V ~, 50-60 Hz
Power consumption	approx. 20 Watts	
Fuse	100-120 V ~:	<b>T 400 mA H</b>
	200-240 V ~:	<b>T 200 mA H</b>
Mains connection	standard IEC receptacle	

### PHYSICAL

Dimension	approx. 3,5" (89 mm) * 19" (482.6 mm) * 5.3" (135 mm)
Weight	approx. 2.5 kg

## 6. WARRANTY

### § 1 WARRANTY CARD/ONLINE REGISTRATION

To be protected by the extended warranty, the buyer must complete and return the enclosed warranty card within 14 days of the date of purchase to BEHRINGER Spezielle Studiotechnik GmbH, in accordance with the conditions stipulated in § 3. Failure to return the card in due time (date as per postmark) will void any extended warranty claims.

Based on the conditions herein, the buyer may also choose to use the online registration option via the Internet ([www.behringer.com](http://www.behringer.com) or [www.behringer.de](http://www.behringer.de)).

### § 2 WARRANTY

1. BEHRINGER (BEHRINGER Spezielle Studiotechnik GmbH including all BEHRINGER subsidiaries listed on the enclosed page, except BEHRINGER Japan) warrants the mechanical and electronic components of this product to be free of defects in material and workmanship for a period of one (1) year from the original date of purchase, in accordance with the warranty regulations described below. If the product shows any defects within the specified warranty period that are not due to normal wear and tear and/or improper handling by the user, BEHRINGER shall, at its sole discretion, either repair or replace the product.

2. If the warranty claim proves to be justified, the product will be returned to the user freight prepaid.

3. Warranty claims other than those indicated above are expressly excluded.

### § 3 RETURN AUTHORIZATION NUMBER

1. To obtain warranty service, the buyer (or his authorized dealer) must call BEHRINGER (see enclosed list) during normal business hours **BEFORE** returning the product. All inquiries must be accompanied by a description of the problem. BEHRINGER will then issue a return authorization number.

2. Subsequently, the product must be returned in its original shipping carton, together with the return authorization number to the address indicated by BEHRINGER.

3. Shipments without freight prepaid will not be accepted.

### § 4 WARRANTY REGULATIONS

1. Warranty services will be furnished only if the product is accompanied by a copy of the original retail dealer's invoice. Any product deemed eligible for repair or replacement by BEHRINGER under the terms of this warranty will be repaired or replaced within 30 days of receipt of the product at BEHRINGER.

2. If the product needs to be modified or adapted in order to comply with applicable technical or safety standards on a national or local level, in any country which is not the country for which the product was originally developed and manufactured, this modification/adaptation shall not be considered a defect in materials or workmanship. The warranty does not cover any such modification/adaptation, irrespective of whether it was carried out properly or not. Under the terms of this warranty, BEHRINGER shall not be held responsible for any cost resulting from such a modification/adaptation.

3. Free inspections and maintenance/repair work are expressly excluded from this warranty, in particular, if caused by improper handling of the product by the user.

This also applies to defects caused by normal wear and tear, in particular, of faders, potentiometers, keys/buttons and similar parts.

4. Damages/defects caused by the following conditions are not covered by this warranty:

- ▲ misuse, neglect or failure to operate the unit in compliance with the instructions given in BEHRINGER user or service manuals.

- ▲ connection or operation of the unit in any way that does not comply with the technical or safety regulations applicable in the country where the product is used.

- ▲ damages/defects caused by force majeure or any other condition that is beyond the control of BEHRINGER.

5. Any repair or opening of the unit carried out by unauthorized personnel (user included) will void the warranty.

6. If an inspection of the product by BEHRINGER shows that the defect in question is not covered by the warranty, the inspection costs are payable by the customer.

7. Products which do not meet the terms of this warranty will be repaired exclusively at the buyer's expense. BEHRINGER will inform the buyer of any such circumstance. If the buyer fails to submit a written repair order within 6 weeks after notification, BEHRINGER will return the unit C.O.D. with a separate invoice for freight and packing. Such costs will also be invoiced separately when the buyer has sent in a written repair order.

### § 5 WARRANTY TRANSFERABILITY

This warranty is extended exclusively to the original buyer (customer of retail dealer) and is not transferable to anyone who may subsequently purchase this product. No other person (retail dealer, etc.) shall be entitled to give any warranty promise on behalf of BEHRINGER.

### § 6 CLAIM FOR DAMAGES

Failure of BEHRINGER to provide proper warranty service shall not entitle the buyer to claim (consequential) damages. In no event shall the liability of BEHRINGER exceed the invoiced value of the product.

### § 7 OTHER WARRANTY RIGHTS AND NATIONAL LAW

1. This warranty does not exclude or limit the buyer's statutory rights provided by national law, in particular, any such rights against the seller that arise from a legally effective purchase contract.

2. The warranty regulations mentioned herein are applicable unless they constitute an infringement of national warranty law.

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