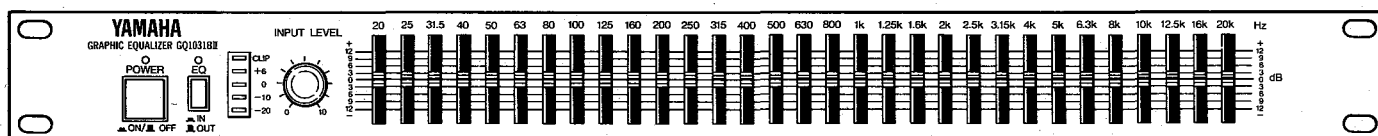


# YAMAHA

**31-Band Graphic Equalizer**  
**Égaliseur Graphique À 31 Bandes**  
**Graphic 31-Band-Equalizer**

# GQ1031BII

**Operating Manual**  
**Mode d'emploi**  
**Bedienungsanleitung**



Congratulations on your purchase of a Yamaha GQ1031BII 31-Band Graphic Equalizer!

Your GQ1031BII is a 1/3-octave graphic equalizer that will give you precise response control over virtually any audio signal for a wide variety of applications.

To ensure that your GQ1031BII gives you optimum performance, be sure to read this manual thoroughly before attempting to operate the unit.

## PRECAUTIONS

- Avoid placing the unit in locations exposed to direct sunlight or high temperatures, excessively high or low humidity, high dust concentration, or vibration.
- Be sure to connect to an AC power supply that meets the power supply specifications listed on the rear of the unit.
- If there is any danger of lightning occurring nearby, remove the power plug from the wall socket in advance.
- To avoid damaging your speakers and other playback equipment, turn off the power of all related equipment before making connections.
- Do not use excessive force in handling control switches and knobs.
- To avoid broken cords and short circuits, be sure to unplug all connectors by grasping the respective plugs—NOT the cords.
- Remove the power plug from the AC mains socket if the unit is not to be used for an extended period of time.
- Remove all plugs and connections if the unit is to be transported, to prevent damage to the cords and jacks.
- Do not use solvents such as benzene or paint thinner to clean the unit. Do not use insecticides or other pressurized spray products in proximity to the unit. Wipe off the exterior with soft cloth.
- The XLR (Cannon) type Input and Output connectors are wired in the following configuration: Pin 1: GROUND. Pin 2: HOT. Pin 3: COLD. Ensure that all equipment connected to the GQ1031BII matches this wiring.

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# GENERAL SPECIFICATIONS

<b>Frequency Response</b>	0 ± 1dB 20Hz ~ 20kHz @ +4dB (all Equalization Controls at flat)	<b>Power Requirements</b>	<b>U.S. &amp; Canadian model</b> 120V AC, 60Hz <b>General model</b> 110V/120V/220V/240V AC, 50/60Hz
<b>Total Harmonic Distortion</b>	Less than 0.05% @ +4dB 20Hz ~ 20kHz (all Equalization Controls at flat)	<b>Power Consumption</b>	<b>U.S. &amp; Canadian model</b> 13W <b>General model</b> 13W
<b>Hum &amp; Noise</b> ( $R_s = 150\Omega$ ) ( <b>INPUT LEVEL SW = +4dB</b> ) ( <b>OUTPUT LEVEL SW = +4dB</b> )	-98dB (12.7kHz 6dB/oct LPF Weighted, Average) -96dB (DIN AUDIO Weighted, Average) -100dB (IHF-A Weighted, Average) Output noise (Input Level Control at maximum & all Equalizer Controls at flat)	<b>Dimensions (W x H x D)</b>	480 mm x 44 mm x 222 mm (18-7/8" x 1-3/4" x 8-3/4")
<b>Maximum Voltage Gain</b>	+24dB: Input level sw at -20dB Output level sw at +4dB	<b>Weight</b>	3.0 kg (6.6 lbs.)
<b>Indicators</b>	Power "ON" . . . . RED GEQ "ON" . . . . RED Level Meter . . . . 5 Points LED METER Metering points: CLIP, +6, 0, -10, -20	<b>Finish</b>	Black semi-gross
<b>Controls</b>	GEQ 31 band (1/3 octave) ○ Center-frequencies 20 25 31.5 40 50 63 80 100 125 160 200 250 315 400 500 630 800 1k 1.25k 1.6k 2k 2.5k 3.15k 4k 5k 6.3k 8k 10k 12.5k 16k 20k Hz ○ Variable Range ±12dB ○ ON/OFF SW Input Level Controls Input Level SW +4/-20dB Output Level SW +4/-20dB	• 0dB is referenced to 0.775V RMS. • Specifications subject to change without notice.	

## INPUT SPECIFICATIONS

CONNECTION	INPUT LEVEL SW	ACTUAL LOAD IMPEDANCE	FOR USE WITH NOMINAL	SENSITIVITY** (AT MAX. GAIN)	INPUT LEVEL		CONNECTOR***
					NOMINAL	MAX. BEFORE CLIP	
INPUT	+4dB	15k ohms	600 ohm LINES	+4dB (1.23V)	+4dB (1.23V)	+20dB (7.75V)	XLR-3-31 type & PHONE JACK
	-20dB			-20dB (77.5mV)	-20dB (77.5mV)	-4dB (489mV)	

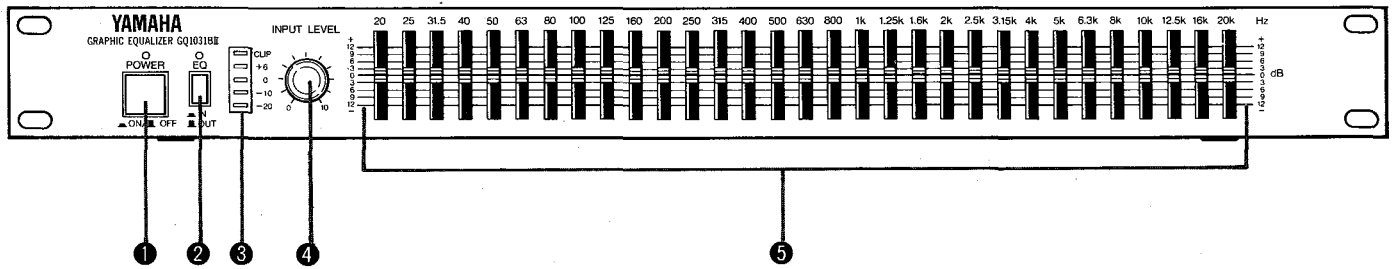
## OUTPUT SPECIFICATIONS

CONNECTION	OUTPUT LEVEL SW	ACTUAL SOURCE IMPEDANCE	FOR USE WITH NOMINAL	OUTPUT LEVEL		CONNECTOR***
				NOMINAL	MAX. BEFORE CLIP	
OUTPUT	+4dB (1.23V)	150 ohms	600 ohm Lines	+4dB (1.23V)	+20dB (7.75V)	XLR-3-32 type
		600 ohms	10k ohm Lines		+18dB (6.16V)	PHONE JACK
	-20dB (77.5mV)	150 ohms	600 ohm Lines	-20dB (77.5mV)	-4dB (489mV)	XLR-3-32 type
		600 ohms	10k ohm Lines		-6dB (388mV)	PHONE JACK

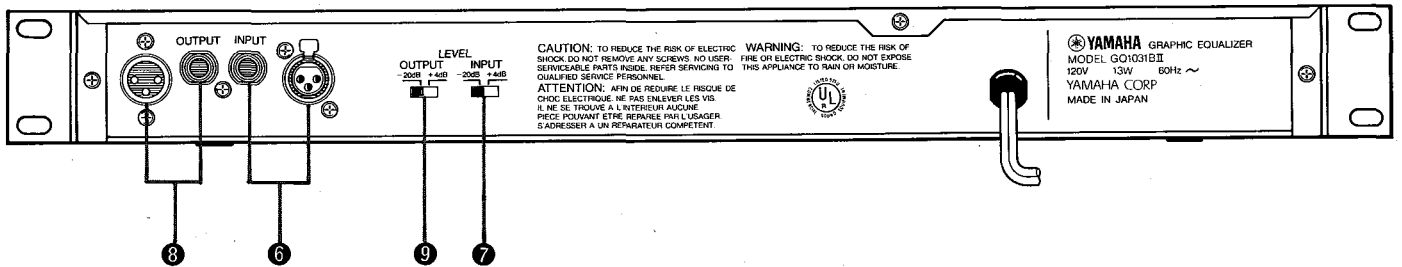
- \* : In these specifications, when dB represent a specific Voltage, 0dB is referenced to 0.775V.  
 \*\* : Sensitivity is the level required to produce an output of +4dB (1.23V).  
 \*\*\* : All XLR type connectors are balanced.  
 : Input Phone Jacks are balanced, Output Phone Jacks are unbalanced.

# CONTROLS & CONNECTIONS

## FRONT PANEL



## REAR PANEL



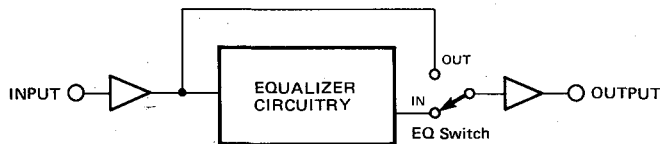
### 1 POWER Switch

Press this switch to turn AC power to the equalizer ON. The POWER indicator lamp located above the POWER switch will light to indicate that power is ON. Press a second time to turn power OFF.

Since the GQ1031BII inputs and 3-pin output are electronically balanced, no signal is delivered to the outputs when the power is OFF.

### 2 EQ Switch

This switch determines whether the equalizer circuitry is on or bypassed—that is, whether the input signal is routed through the EQ circuitry or directly to the output, “bypassing” the equalizer circuitry.



The EQ indicator LED above the EQ switch will light when the EQ circuitry is ON. This switch is useful for comparing the equalized and unequalized signal.

### 3 LEVEL METER

The output level meter consists of 5 LED segments. To obtain an optimum output level, adjust the INPUT LEVEL control so that CLIP does not light. The output level is +4 dB (1.23 V) when the segments up to the center “0” light.

### 4 INPUT LEVEL control

INPUT LEVEL control for graphic equalizer adjust the input signal for optimum input level. When the LEVEL control is turned fully clockwise, the input source signal level remains unchanged (+4 dB or -20 dB). As the LEVEL control is turned counterclockwise, the input level is reduced.

This control can be used restore the output level when the overall level has been changed during the equalization process. This, however, will also change the input level. Equalization methods which do not change the LEVEL control setting will yield a better signal-to noise ratio and wider dynamic range.

### 5 Equalization Controls

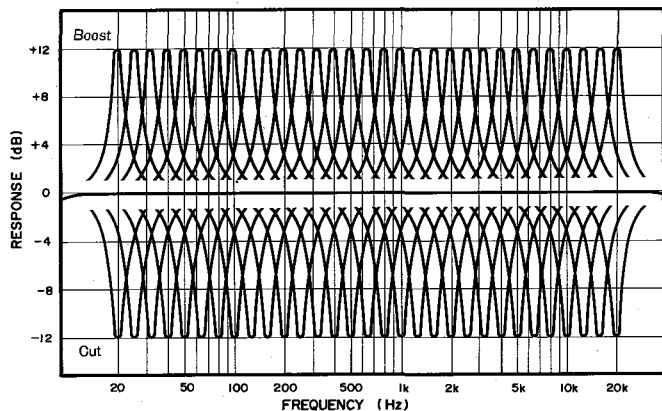
These are the actual equalization controls.

31 bands of equalization are provided at standard ISO 1/3-octave frequencies:

20, 25, 31.5, 40, 50, 63, 80, 100, 125, 160, 200, 250, 315, 400, 500, 630, 800, 1k, 1.25k, 1.6k, 2k, 2.5k, 3.15k, 4k, 5k, 6.3k, 8k, 10k, 12.5k, 16k, and 20 kHz. Each band can be boosted or cut by up to 12 dB.

"Boosting" a band by moving its control toward the "+" end of the scale increases the level of the selected frequency band, while "cutting" or "attenuating" a band by moving its control toward the "-" end of the scale decreases the level of the selected frequency band.

If the equalizing output level attains the clipping level, the "CLIP" segment of the level meter will light up. In such a case, reduce the output level of the input source applied to the unit, or turn the INPUT LEVEL control 4 counterclockwise to reduce the input level. For an equalization operation in the optimum range, be sure to refer to the level meter indication to prevent output distortion.



### 6 INPUT Connectors

The balanced (3-pin female XLR type connector) and balanced (1/4" TRS phone jack) input connectors are available. A 600 ohm line should be used for both. Use the INPUT LEVEL switch to set the rated input level to either +4 dB or -20 dB.

### 7 INPUT LEVEL Switch

Use this switch to set the rated nominal input level to correspond to the rated output level of the equipment to be connected. (-20 dB/+4 dB)

### 8 OUTPUT Connectors

The balanced (3-pin male XLR type connector) and unbalanced (1/4" phone jack) output connectors are available. A 600 ohm line should be used for the balanced XLR and a 10k ohm line for the unbalanced 1/4" phone jack. Use the OUTPUT LEVEL switch to set the rated nominal output level to either +4 or -20 dB.

### 9 OUTPUT LEVEL Switch

Use this switch to set the rated nominal output level to correspond to the rated input level of the equipment to be connected. (-20 dB/+4 dB)

# APPLICATIONS

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The GQ1031BII offers a full 31 bands of equalization, permitting extremely fine control over the frequency response of any audio signal. This capability is particularly useful in various applications.

A few of the possibilities are as follows:

## 1. Room Equalization

The sound of any playback system—be it a home stereo or a huge sound reinforcement system—will vary greatly when used in different “rooms”. Of course, the “room” could be a living room, recording studio, theater, concert hall or colosseum. This is because each room has its own characteristic acoustic properties which affect the sound. Some parts of the room will reflect sounds at certain frequencies, while others will absorb specific parts of the audio spectrum in varying degrees. The result is that even though the frequency response of your playback system may be quite flat, the sound that reaches the listener’s ears may not be. A graphic equalizer like the GQ1031BII can compensate for this problem, producing a flat acoustic response in any environment.

For really accurate response compensation in this type of application some measuring equipment will be necessary—a spectrum analyzer with a pink noise signal source, or sound level meter with a warble-tone signal source. If your equalization requirements are critical—as they would be in a recording studio control room—we recommend that you acquire the necessary equipment (such equipment can often be rented at a nominal charge). But for general sound reinforcement and many other situations, the equalization can be carried out by ear. The only requirement is that you have a familiar source—a record or tape—that can function as a reference. You know how your reference source should sound, and you adjust the equalizer until you achieve that sound. Listening with a pair of top-quality headphones can also be a useful guide to how the source should sound without the affects of room acoustics. This type of equalization requires some practice since you’ll need to be able to roughly evaluate response by ear.

## 2. Feedback Control

This is primarily a sound reinforcement application, since it is in this field that feedback problems generally occur. Feedback normally occurs when the sound from a speaker finds its way back into the amplification system via a microphone. The sound picked up by the mic is re-amplified and picked up by the mic again, causing the electro/acoustic “feedback” system to oscillate at its natural resonance frequency. A microphone too close to a stage monitor or house speaker can cause feedback, and the most effective solution is the relocate the microphone or speaker so that the feedback path is lengthened so that the signal picked up at the mic is too small to cause feedback. If relocation of the sound source and pickup does not solve the problem, however, graphic equalization can do the trick. Simply, if the gain of the system at the feedback frequency is reduced, the feedback can be stopped.

Start by applying maximum cut (attenuation) to the frequency bands at which the feedback is likely to be occurring—one band at a time. Eventually you’ll find the control that stops the feedback. Now, gradually increase the level of that band until the feedback starts again, then decrease the level to about 2 or 3 dB below the level at which the feedback stops—this is the optimum feedback control setting. You might find that feedback is occurring at two or more frequencies in a complex setup. In this case each frequency must be treated in the same way.

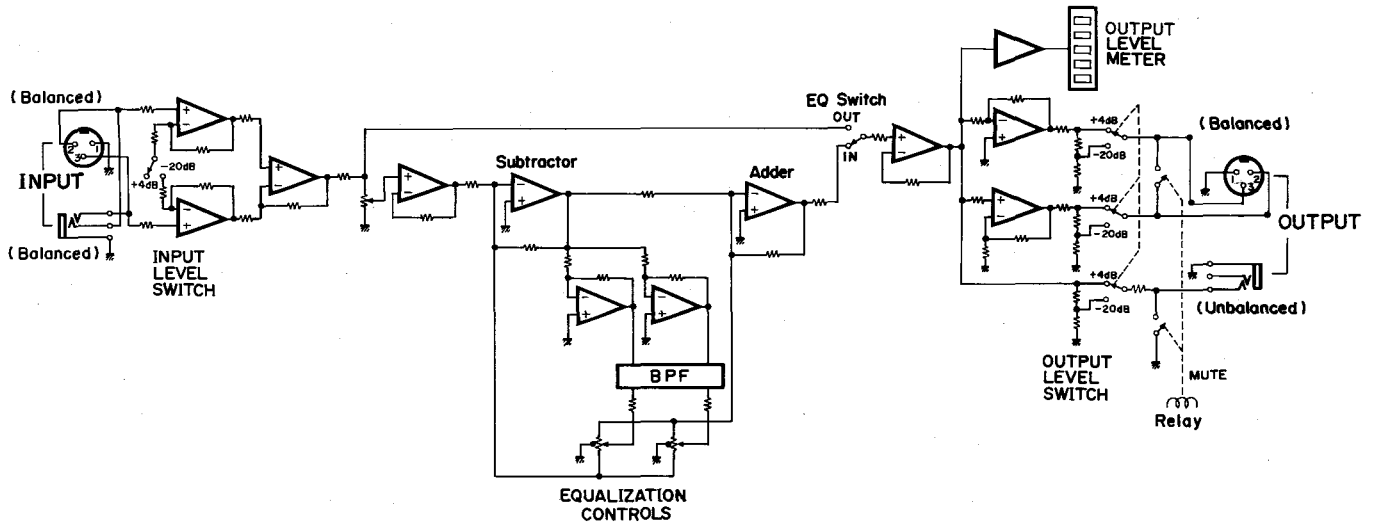
## 3. Sound Reinforcement Monitor Equalization

A GQ1031BII inserted between the line-level feed from each monitor output of a sound reinforcement mixer and the corresponding monitor amplifiers can be useful in providing the most effective monitor sound. Particularly when a lot of amplified instruments are being used on-stage, the monitor sound can become muddy and unintelligible. The equalizer can be used to tailor the monitor response so it cuts through all the on-stage noise. A vocalist is generally able to hear him- or herself better, for example, if the response above 3 kHz and below about 500 Hz is rolled off, leaving mainly the vocal frequency spectrum. The best EQ in this application, however, is generally arrived at by trial-and-error during the pre-performance sound check.

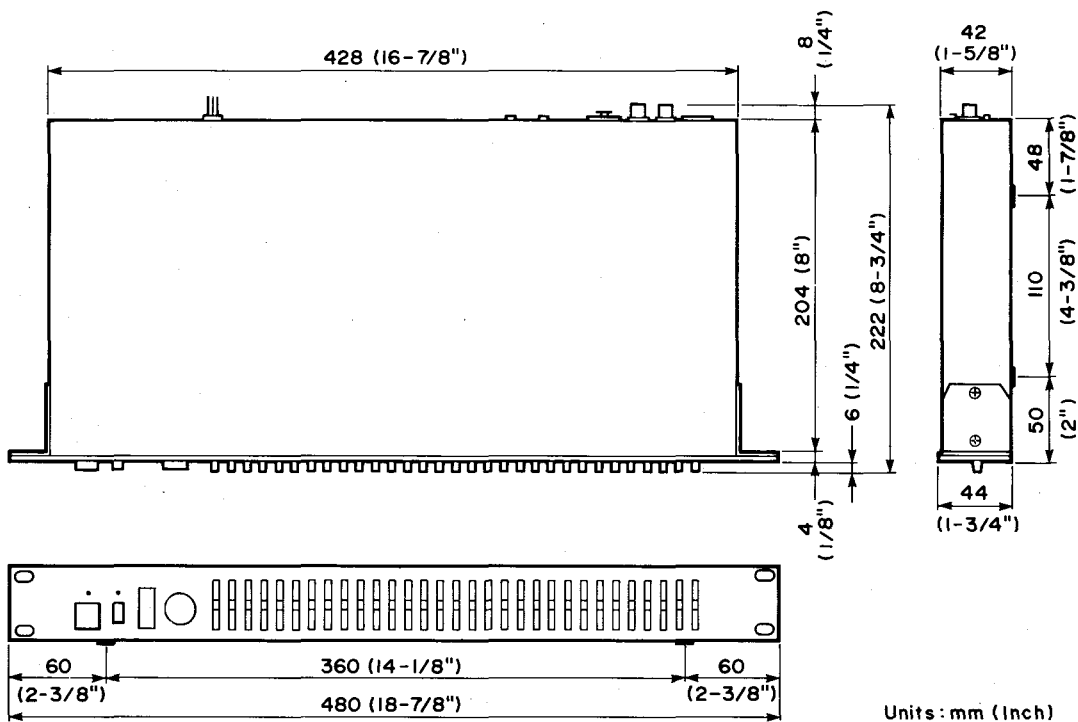
## 4. Creative Equalization

In this application the equalizer is actually used as a creative tool, rather than for compensation or control. The GQ1031BII can be used with musical instruments to emphasize certain tonal qualities they possess, or to create a totally new sound. The graphic equalizer is extremely versatile in recording situations, as well. Some careful equalization can make the sounds of different instruments blend together more smoothly, or create a number of different tonal “moods”. If this is you’re main application, you’ll find that the ways you can use a versatile equalizer like the GQ1031BII are virtually unlimited.

# BLOCK DIAGRAM



# DIMENSIONS



**IMPORTANT NOTICE FOR THE UNITED KINGDOM**

**Connecting the Plug and Cord**

**IMPORTANT.** The wires in this mains lead are coloured in accordance with the following code:

**BLUE : NEUTRAL**

**BROWN : LIVE**

*As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug proceed as follows:*

The wire which is coloured **BLUE** must be connected to the terminal which is marked with the letter **N** or coloured **BLACK**.

The wire which is coloured **BROWN** must be connected to the terminal which is marked with the letter **L** or coloured **RED**.



# YAMAHA

## SERVICE

The GQ1031BII are supported by Yamaha's worldwide network of factory trained and qualified dealer service personnel. In the event of a problem, contact your nearest Yamaha dealer.

## SERVICE APRÈS-VENTE

Le GQ1031BII est supporté par un réseau mondial de services après-vente Yamaha animés par un personnel de vente et des techniciens dépanneurs qualifiés et formés en usine. N'hésitez pas à vous en remettre au distributeur Yamaha le plus proche de votre domicile en cas de doute ou de panne.

## KUNDENDIENST

Für den GQ1031BII wie für alle anderen Produkte von Yamaha steht ein weltweites Netz von speziell ausgebildeten Kundendienst-technikern im Störfall bereit. Bitte wenden Sie sich an Ihren nächsten Yamaha-Fachhändler, sollte bei Ihrem Gerät eine Funktionsstörung auftreten.