User Manual

MINIFBQ FBQ800

Ultra-Compact 9-Band Graphic Equalizer with FBQ

EN

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EN Important Safety Instructions

CAUTION
RISK OF ELECTRIC SHOCK!
DO NOT OPEN!
ATTENTION
RISQUE D'ÉLECTROCUTION !
NE PAS OUVRIR !

Terminals marked with this symbol carry electrical current of sufficient magnitude to constitute risk of electric shock. Use only high-quality professional speaker cables with ¼" TS or twist-locking plugs pre-installed. All other installation or modification should be performed only by qualified personnel.

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. Please read the manual.

Caution
To reduce the risk of electric shock, do not remove the top cover (or the rear section). No user serviceable parts inside. Refer servicing to qualified personnel.

Caution
To reduce the risk of fire or electric shock, do not expose this appliance to rain and moisture. The apparatus shall not be exposed to dripping or splashing liquids and no objects filled with liquids, such as vases, shall be placed on the apparatus.

Caution
These service instructions are for use by qualified service personnel only. To reduce the risk of electric shock do not perform any servicing other than that contained in the operation instructions. Repairs have to be performed by qualified service personnel.

1. Read these instructions.

2. Keep these instructions.

3. Heed all warnings.

4. Follow all instructions.

5. Do not use this apparatus near water.

6. Clean only with dry cloth.

7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.

8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.

9. 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.

10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.

11. Use only attachments/accessories specified by the manufacturer.

12. 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.

13. Unplug this apparatus during lightning storms or when unused for long periods of time.

14. 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.

15. The apparatus shall be connected to a MAINS socket outlet with a protective earthing connection.

16. Where the MAINS plug or an appliance coupler is used as the disconnect device, the disconnect device shall remain readily operable.

1. Introduction

The MINIFBQ FBQ800 was designed with our experience and know-how in filter technology, which spans many years. Our analog and digital equalizers are used the world over in reputable radio and TV stations, studios, and PA systems. As with the rest of our product line, we put forth uncompromising demands in terms of quality for the controls, the sound, the technical data, and the fit and finish of the MINIFBQ FBQ800.

FBQ Feedback Detection System

The FBQ Feedback Detection System is one of the most outstanding characteristics of our graphic equalizers. In this ingenious circuitry, LEDs on the frequency band faders identify high energy levels, which indicate the likelihood of feedback. What was once a labor-intensive search for feedback is now an activity that even a child could master. In addition, the MINIFBQ FBQ800 can replace an audio analyzer in your audio setups.

◊ **Please read the manual carefully and keep it around for future reference.**

1.1 Before you begin

1.1.1 Shipment

Your MINIFBQ FBQ800 was carefully packed at the factory, and the packaging was 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 that may have occurred during transit.

◊ **If the unit is damaged, please do NOT return it to BEHRINGER. Instead, notify your dealer and the shipping company immediately. Otherwise, claims for damage or replacement may not be honored.**

◊ **Always use the original packing carton to prevent damage during storage or transport.**

◊ **Make sure that no children are left unsupervised with the FBQ800 or its packaging.**

◊ **Please ensure proper disposal of all packing materials.**

1.1.2 Initial operation

Please make sure the unit is provided with sufficient ventilation, and never place the FBQ800 on top of an amplifier or in the vicinity of a heater to avoid the risk of overheating. To power the FBQ800, use only the power supply unit that is delivered with your equipment.

1.1.3 Online registration

Please register your new BEHRINGER equipment right after your purchase by visiting http://behringer.com and read the terms and conditions of our warranty carefully.

Should your BEHRINGER product malfunction, it is our intention to have it repaired as quickly as possible. To arrange for warranty service, please contact the BEHRINGER retailer from whom the equipment was purchased. Should your BEHRINGER dealer not be located in your vicinity, you may directly contact one of our subsidiaries. Corresponding contact information is included in the original equipment packaging (Global Contact Information/European Contact Information). Should your country not be listed, please contact the distributor nearest you. A list of distributors can be found in the support area of our website (http://behringer.com).

Registering your purchase and equipment with us helps us process your repair claims more quickly and efficiently.

Thank you for your cooperation!

2. Control Elements

This chapter introduces the FBQ800 and provides what you need to know about:

• using the FBQ800 (section 2.2 Front panel)

• setting up the FBQ800 (section 2.3 Rear panel)

◊ **Ensure that only qualified personnel set up and operate the FBQ800.**

2.1 About the FBQ800

The FBQ800 is a graphic equalizer that you use to modify the strength and quality of audio signals.

More specifically, you can use the FBQ800 to:

• homogenize audio signals

• correct audio signals

• filter low-frequency audio signals (feedback, floor rumble, room resonance, and mains hum)

Input sources

The FBQ800 can receive signals from studio or Hi-Fi units. Some examples of these units include mixers, soundcards, CD-players, and signal processors.

In this documentation, the signals that the FBQ800 receives are referred to as **input signals**. Audio units that send input signals to the FBQ800 are referred to as **input sources**.

Output targets

The FBQ800 can send signals to studio or Hi-Fi units. Some examples of these units include mixers, soundcards, and power amplifiers.

In this documentation, the signals that the FBQ800 sends are referred to as **output signals**. Audio units that receive output signals from the FBQ800 are referred to as **output targets**.

2.2 Front panel

This section describes how to use the front panel of the FBQ800, illustrated as follows:
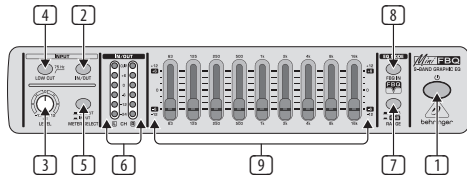

Fig. 2.1: FBQ800 front panel

In the previous illustration, each control element is associated with a callout, for example . To identify details about each control element in this documentation, use these callouts. The numeric order of these callouts identifies the FBQ800 signal path.

◊ **Before you turn on the FBQ800, turn the LEVEL control to -12 (minimum setting).**

① ⏻ (**POWER**) button: To turn the FBQ800 on and off, use this button, which can appear:

- pushed in and illuminated: The FBQ800 is on.
- not pushed in and not illuminated: The FBQ800 is off.

◊ **When you finish using the FBQ800, unplug the power supply unit from the power source. As long as the power supply unit is connected to a power source, the power supply unit consumes energy.**

② **IN/OUT** button: To activate or, alternatively deactivate control elements, use this button, which can appear:

- pushed in and illuminated: The FBQ800 activates all control elements.
- not pushed in and not illuminated: The FBQ800 deactivates most control elements. However, you can use the METER SELECT button ⑤ and the IN/OUT meter ⑥.

If you activated all control elements ②, you can use control elements ③ and ④ to prepare the input signal for EQing, as follows:

③ **LEVEL CONTROL**: To adjust the level of the input signal, turn this control toward **-12 dB** (minimum setting) or, alternatively **+12 dB** (maximum setting). Some signals have high levels that can deteriorate sound and equipment.

For details about managing the signal level, see ⑥ **How to manage the signal level**.

④ **LOW CUT** button: To manage the low-cut filter, use this button, which can appear:

- pushed in and illuminated: The low-cut filter eliminates sounds that are below 75 Hz (floor rumble, room resonance, and mains hum, for example).
- not pushed in and not illuminated: The low-cut filter does not eliminate any sounds.

To monitor the input signal or, alternatively the output signal, use control elements ⑤ and ⑥, as follows:

⑤ **METER SELECT** button: To select the type of signal you want to monitor, use this button, which can appear:

- pushed in and illuminated: Monitor the **input** signal as soon as this signal enters the FBQ800. The FBQ800 does not apply the LEVEL control or any other control elements to the input signal that you monitor.
- not pushed in and not illuminated: Monitor the **output** signal as soon as this signal leaves the FBQ800. The FBQ800 applies all control elements to the output signal that you monitor. However, if you deactivated most of the control elements ②, the input signal and the output signal are the same.

⑥ **IN/OUT METER**: To monitor the level of the signal that you selected with the METER SELECT button, use this stereo meter. Both the left (**L**) and right (**R**) sides of this meter share the same decibel scale (**-24 dB** to **+6 dB**). If the signal level is too high, the CLIP LED illuminates.

◊ **At 0 (zero) dB, the FBQ800 still has approximately 15 dB of headroom. How to manage the signal level**

Optimally, you want to maintain the signal level of the FBQ800 at 0 dB. When the signal level is:

- less than 0 dB, the signal is not full. If the difference between the level of the noise floor and the level of the signal is not sufficient, you lose signal quality.
- greater than 0 dB, the CLIP LED illuminates on the IN/OUT meter. The signal can overload the FBQ800. However, occasional clipping will not damage the sound quality.

Because sounds are not perfectly consistent, you cannot flawlessly maintain the signal level at 0 dB. However, you can consistently manage the signal level. This involves monitoring and adjusting the level of the input signal and the output signal, as follows:

1. To begin EQing in a neutral environment, set all frequency-band faders ⑨ to 0 dB.

2. To protect the FBQ800 against signals that are unexpectedly high, turn the LEVEL control ③ to -12 dB.

3. To monitor the input level, use the METER SELECT button ⑤ together with the IN/OUT meter ⑥, as described in this documentation. If the input level is higher or lower than 0 dB and you:

- can adjust the output level of the input source, adjust the **output level of the input source** until the **input level of the FBQ800** is 0 dB
- cannot adjust the output level of the input source, set the output level of the FBQ800 to 0 dB, as follows:

    A. To activate all control elements, use the IN/OUT button ②.

A.   B. To monitor the output level of the FBQ800, use the METER SELECT button ⑤ together with the IN/OUT meter ⑥, as described in this documentation.

B.   While you monitor the output level of the FBQ800, use the LEVEL knob ③ to adjust the output level of the FBQ800 to 0 dB.

4.   If the frequency-band faders and all other control elements are not already activated, use the IN/OUT button ② to activate them.

5.   To EQ the signal, use the EQ section ⑨, as described in this documentation.

6.   To monitor the output level, use the METER SELECT button ⑤ together with the IN/OUT meter ⑥, as described in this documentation. If the output level is higher or, alternatively lower than 0 dB, use the LEVEL control ③ to adjust the output level to 0 dB.

◊   **Most of the time, 0 dB is the optimal output level. However, the optimal level for some output targets can be greater or less than 0 dB.**

7.   Periodically monitor and, if necessary, adjust the input level and output level, as described previously in steps 3 and 6.

If you activated all control elements ②, you can use control elements through to EQ the input signal, as follows:

⑦   **RANGE** button: To select a range for the EQ faders, use this button, which can appear:

•   pushed in and illuminated: The fader range extends from **-6 dB** to **+6 dB**.

•   not pushed in and not illuminated: The fader range extends from **-12 dB** to **+12 dB**.

⑧   **FBQ IN** button: To manage the FBQ Feedback Detection System, use this button, which can appear:

•   pushed in and illuminated: The FBQ Feedback Detection System is activated. If the signal level is high in a frequency band, the relevant fader LED illuminates brightly. In addition, all other fader LEDs are dimmed. To reduce the potential for feedback, cut the signal in the relevant frequency band ⑨.

•   not pushed in and not illuminated: The FBQ Feedback Detection System is not activated. Fader LEDs illuminate with identical brightness. They do not identify possible feedback frequencies.

⑨   **EQ SECTION**: If you activated all control elements ②, the input signal travels to the EQ section. In this section, you EQ (EQualize) the input signal. This means that you emphasize and de-emphasize specific frequencies, many of which are associated with specific sounds. For details, see **About sounds and their frequency bands**, which follows.

About the frequency-band faders

The EQ section includes 9 frequency bands. For each of these frequency bands, the EQ section includes a single fader. The center frequency of each frequency band is displayed directly above the relevant fader, as follows:

• 63	• 500	• 4 k
• 125	• 1 k	• 8 k
• 250	• 2 k	• 16 k

These center frequencies are expressed in hertz. The letter k is the abbreviation for kilo (kilohertz). Notice that the center frequencies increase in one-octave steps. This means that equal intervals of pitch separate the frequency bands.

About sounds and their frequency bands

To help you EQ, the following table lists some typical sounds and identifies the frequency bands in which they occur. The table also describes what happens to some sounds when you overemphasize them:

Sounds	Frequencies (Hz)
AC mains hum; the fundamentals of instruments that add power to music, which include bass drums, tubas, double bass, and organs. Overemphasis sounds **muddy**.	31 – 63
the vocal power of bass singers	40 – 125
mains hum; the fundamentals of lower tympani. Overemphasis produces excessive boom.	80 – 125
third harmonic mains hum; voice fundamentals; drums and lower bass. Overemphasis produces excessive boom.	160 – 250
Vocal quality; the fundamentals of strings and percussion instruments	315 – 500
natural vocals; the fundamentals and harmonics of string, keyboard, and percussion instruments	630 – 1 k
voice fricatives; strings, drums, guitars, and bass. Overemphasis between 1 k and 4 k can cause fatigue. Overemphasis between 2 k and 4 k can mask some vocal sounds, for example m, b, and v.	1.25 k – 4 k
overall clarity and definition	1.25 k – 8 k
tape hiss and system noise; cymbals, snare drums, and percussion instruments; distant and transparent sounds	5 k – 8 k
tape hiss and system noise; cymbals and overall brightness. Overemphasis causes sibilance.	10 k – 16 k

How to emphasize and de-emphasize sounds

To emphasize or, alternatively to de-emphasize a sound, do the following:

1)   Identify the frequency band in which the sound occurs, and then identify the relevant fader.

2) If you want to:

- emphasize the sound, do one of the following:
  - Slide the relevant fader up. The FBQ800 boosts the signal level in the relevant frequency band.
  - Slide the faders for the surrounding frequency bands down. The FBQ800 cuts the signal level in the surrounding frequency bands.
- de-emphasize a sound, do one of the following:
  - Slide the relevant fader down. The FBQ800 cuts the signal level in the relevant frequency band.
  - Slide the faders for the surrounding frequency bands up. The FBQ800 boosts the signal level in the surrounding frequency bands.

◊ **When you choose to cut rather than boost the signal level, you protect audio equipment from high signal levels (clipping) and preserve valuable headroom.**

2.3 Rear panel

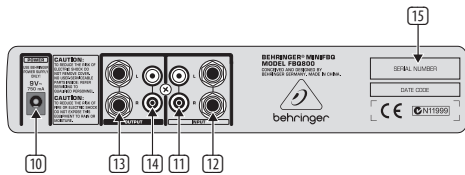This chapter describes what you need to know about setting up the FBQ800.

Fig. 2.2: FBQ800 rear panel

◊ **Before you plug the power supply unit in the FBQ800, turn off the ⏻ (power) button.**

⑩ **POWER** connector: To power the FBQ800, plug the power supply unit in this connector. The power supply unit is delivered with the FBQ800.

To send the **input signal** to the FBQ800, use one of the following inputs:

⑪ RCA **INPUT**, **L** (left) and **R** (right): for RCA plugs

⑫ ¼" TRS **INPUT**, **L** (left) and **R** (right): for TRS (balanced) or, alternatively TS (unbalanced) plugs

If you simultaneously use both RCA and TRS INPUTs, the FBQ800 receives the input signal only via the TRS INPUT ⑫. To work with:

- a stereo signal, use **both** the L and R connectors
- a mono signal, use **only** the L or, alternatively the R connector

To send the **output signal** from the FBQ800, you can use the following types of outputs:

⑬ ¼" TS **OUTPUT**, **L** (left) and **R** (right): for TS (unbalanced) plugs

⑭ RCA **OUTPUT**, **L** (left) and **R** (right): for RCA plugs

You can simultaneously use both TS and RCA OUTPUTs. Whether or not you use both the L and the R connectors depends on the type of input signal the FBQ800 receives. When the FBQ800 receives:

- a stereo signal, use **both L and R OUTPUT** connectors. The output signal is also a stereo signal.
- a mono signal via an L INPUT connector, use **only L OUTPUT** connectors. The output signal is also a mono signal.
- a mono signal via an **R** INPUT connector, use **only R OUTPUT** connectors. The output signal is also a mono signal.

⑮ **SERIAL NUMBER**: To register your FBQ800, use this unique serial number.

For details about audio plugs, see **4. Audio Connections**.

3. Setup Example

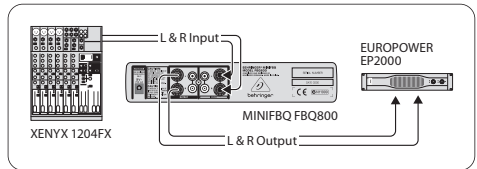The following graphically highlights the role of the FBQ800 in your audio setups:

Fig. 3.1: Setup example

Keep in mind that the previous illustration provides only a single example of how you can use the FBQ800. You can also set the FBQ800 up in the insertion paths of mixers.

About setting up with other MINI products

The FBQ800 belongs to the MINI suite of BEHRINGER products. You can set up the FBQ800 with these products, which is both convenient and attractive. For details, see 6. Other Mini Products.

4. Audio Connections

To connect audio units to the FBQ800, you can use patch cords that include the following types of plugs:

- RCA (unbalanced)
- ¼" TS (unbalanced)
- ¼" TRS (balanced)

Illustrations of these plugs follow:

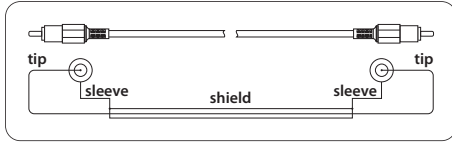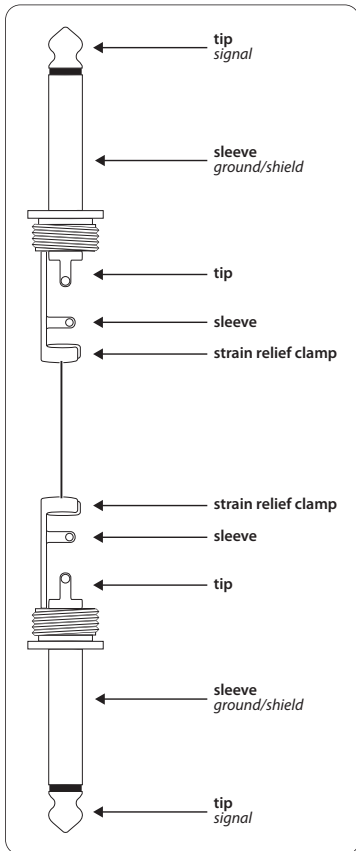
Fig. 4.1: Patch cord with RCA plugs
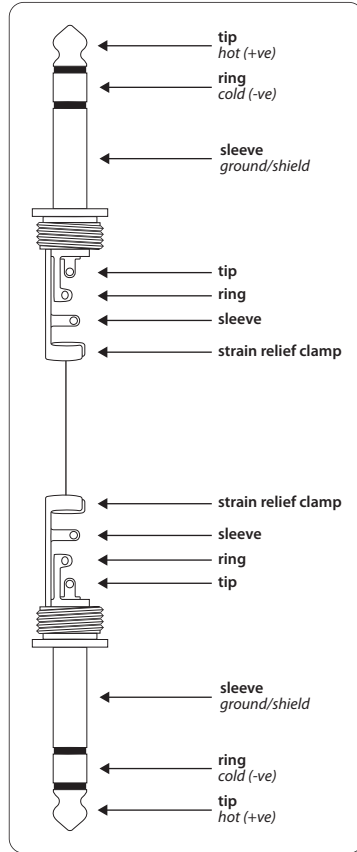

Fig. 4.2: Patch cord with ¼" TS plugs

Fig. 4.3: Patch cord with ¼" TRS plugs

For details about FBQ800 connectors, see 2.3 Rear panel.

5. Specifications

Input

Type	¼" TRS connectors (balanced) or RCA connectors (unbalanced)
Impedance	approx. 20 kΩ, balanced approx. 10 kΩ, unbalanced
CMRR	40 dB typ. @ 1 kHz
Max. input level	+15 dBu

Output

Type	¼" TS connecotrs (unbalanced) or RCA connectors (unbalanced)
Impedance	approx. 120 Ω
Max. output level	+15 dBu

System Specifications

Frequency response	10 Hz to 200 kHz, -3 dB
Dynamic range	110 dB, 10 Hz to 22 kHz
Distortion	0.003% typ. @ 0 dBu
Crosstalk	< 80 dBu @ 1 kHz
Signal-to-noise ratio	10 Hz - 22 kHz < 95 dB @ 0 dBu, a-weighted

Graphic Equalizer

Type	9 analog stereo bands
Control range	±6 dB or ±12 dB, switchable
Bandwidth	1 oct.

Other Features

Low-cut filter	75 Hz (12 dB/oct.)
Input level control	-12 dB to +12 dB

Power Supply

Mains connection	external power supply, 9 V~ / 750 mA

Mains Voltage

USA/Canada	120 V~, 60 Hz
U.K./Australia	240 V~, 50 Hz
China	220 V~, 50 Hz
Europe	230 V~, 50 Hz
Japan	100 V~, 50 - 60 Hz
Power consumption	approx. 7.0 W

Dimensions/Weight

Dimensions (H x W x D)	approx. 1 ⁸⁄₉ x 9 ⁵⁄₉ x 4 ⁵⁄₇" approx. 48 x 243 x 120 mm
Weight	approx. 0.86 lbs / 0.39 kg

BEHRINGER constantly strives to maintain the highest quality standards. Modifications may be made, if necessary, without prior notice. The specifications and appearance of the equipment may therefore differ from those listed or illustrated. from those listed or illustrated.

We Hear You

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