



## *BBE DI-100 USER MANUAL*



# IMPORTANT SAFEGUARDS

## WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.  
ATTENTION: RISQUE DE CHOC ELECTRIC-NE PAS OUVRIIR.

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated 'dangerous voltage' within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point, within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.



**For your protection, please read these safety instructions completely before operating the appliance, and keep this manual for future reference. Carefully observe all warnings, precautions and instructions on the appliance described in the operating instruction supplied with the appliance.**

## INSTALLATION

- Water and Moisture** - Do not install the appliance near water: for example, near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool.
- Heat** - Do not install the appliance near sources of heat such as radiators, heat registers, stoves, or other appliances that produce heat.
- Ventilation** - Situate the product so its location or position does not interfere with its proper ventilation. For example, you should not place the product on a bed, sofa, rug, or similar surface that might block the vent openings, or placed in a built-in installation, such as a bookcase or cabinet that might impede the flow of air through the ventilation openings.
- Wall or Ceiling Mounting** - If your appliance can be mounted to a wall or ceiling, mount it only as recommended.

## USE

- Power Source** - Connect the appliance to a power supply only of the type described in the operating instructions or as marked on the appliance.
- Power-Cord Protection** - Route the power cord so that it is not likely to be walked on or pinched by having objects placed on it, paying particular attention to the plugs, receptacles, and the point where the cord exits from the appliance.
- Grounding or Polarization** - Do not defeat the grounding or polarization feature of the AC power cord. If your AC receptacle will not accept the power cord plug, contact your electrician to install a proper AC receptacle.
- When not in use** - Unplug the power cord of the appliance from the outlet when left unused for a long period of time. To disconnect the cord, pull it out by grasping the plug. Never pull the plug out by the cord.
- AC Receptacle** - Check to make sure that the AC receptacle holds the power cord plug firmly and securely. If the power cord plug is loose, contact your electrician to replace the defective and unsafe AC
- Foreign Objects** - Be careful that foreign objects and liquids do not enter the enclosure through openings.

## SERVICE

- Unplug the appliance from the wall outlet and consult qualified service personnel when:
- the power cord or the plug has been damaged.
  - a solid object or liquid has fallen into the cabinet.
  - the appliance has been exposed to rain or moisture.
  - the appliance does not appear to operate normally or exhibits a marked change in performance.
  - the appliance has been dropped, or the enclosure damaged.

Do not attempt to service the appliance beyond that described in the operating instructions. For all other servicing, refer to qualified service personnel **only**.

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Congratulations on your purchase of the BBE DI-100 Active Direct Box with Sonic Maximizer, a two channel active direct box with signal processor that will benefit any sound reproduction system. You now own an active direct box with a very unique signal processing device with no equal in the world. You will find the BBE DI-100's rugged construction and careful electronic design a welcome addition to your arsenal.

The features that make up the BBE DI-100 are:

1. Built-in BBE Sonic Maximizer with independent PROCESS and LO CONTOUR controls.
2. A FUNCTION switch to allow for the comparison of the BBE processed signal to the unprocessed signal.
3. A FOOTSWITCH input mono jack for easy connection to any mono shorting footswitch.
4. 1/4" PHONE jack for signal insertion.
5. Input pad switch for instrument or line level input.
6. Ground lift switch to lift the unit's ground connection.
7. XLR and 1/4" phone jacks for balanced and unbalanced outputs.

8. Tri-mode powering for three different modes of powering:
  - a) internal 9V battery,
  - b) 9VDC external power source, and
  - c) 48V phantom power source through the XLR connector.NOTE: When using phantom powering, XLR ground lift must be off.
9. Tri-mode power scanning feature which scans the three power sources and uses only the highest source of power and shuts off the other power sources.

## **IMPORTANT**

Before you begin, please check the contents within this box to insure that included are:

1. The BBE DI-100 Active Direct Box with built-in Sonic Maximizer.
2. Four (4) Rubber Feet for "Table Mount" applications.
3. The BBE DI-100 User's Manual.
4. 9VDC External Power Source

If any of these items are found to be damaged or missing, immediately contact the BBE dealer from whom the unit was purchased.

This manual will help you to effectively utilize the BBE DI-100. Reviewing the information contained in this manual will answer most of the common questions that our service department receives. If you still have questions, please feel free to call (714) 897-6766.

## The BBE Process - 'What it is'

Loudspeakers have difficulty dealing with the electronic signals supplied by an amplifier. These difficulties cause such major phase and amplitude distortion that the sound reproduced by a speaker differs significantly from the sound produced by the original source.

In the past, these problems proved unsolvable and were thus delegated to a position of secondary importance in audio system design. However, phase and amplitude integrity is essential to accurate sound reproduction. Research shows that the information which the listener translates into the recognizable characteristics of a live performance are intimately tied into complex time and amplitude relationships between the fundamental and harmonic components of a given musical note or sound. These relationships define a sound's "sound".

When these complex relationships pass through a speaker, the proper order is lost. The higher frequencies are delayed. A lower frequency may reach the listener's ear first or perhaps simultaneously with that of a higher frequency. In some cases, the fundamental components may be so time-shifted that they reach the listener's ear ahead of some or all of the harmonic components.

This change in the phase and amplitude relationship on the harmonic and fundamental frequencies is technically called "envelope distortion." The listener perceives this loss of sound integrity in the reproduced sound as "muddy" and "smeared." In the extreme, it can become difficult to tell the difference between musical instruments, for example, an oboe and a clarinet.

BBE Sound, Inc. conducted extensive studies of numerous speaker systems over a ten year period. With this knowledge, it became possible to identify the characteristics of an ideal speaker and to distill the

corrections necessary to return the fundamental and harmonic frequency structures to their correct order. While there are differences among various speaker designs in the magnitude of their correction, the overall pattern of correction needed is remarkably consistent.

The BBE process is so unique that 42 patents have been awarded by the U.S. Patent Office.

## The BBE Process - 'How It Works'

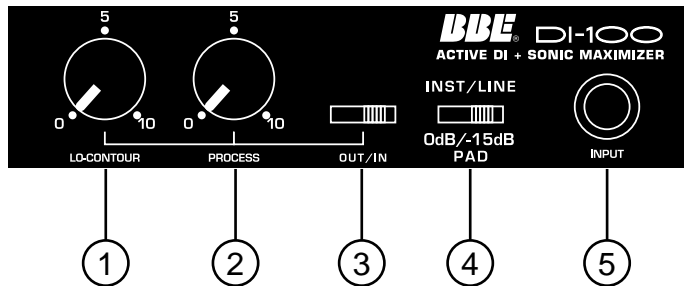
The BBE Process imparts a pre-determined phase correction to the high frequencies where most harmonic information exists. This is done by breaking the signal into three sub-bands or groups: a.) LOs (20Hz - 150Hz), b.) MIDs (150Hz - 1200Hz), and c.) HIGHs (1200Hz - 20kHz).

The low group is delayed about 2.5 ms (milliseconds) via a delay within the passive low pass filter. The front panel Lo CONTOUR control allows for either a flat response or a boost at 50Hz.

The mid-range group is delayed only about 0.5ms and passes through an active band-pass filter while the high frequency group is passed through a VCA (Voltage Controlled Amplifier). The high group is used as a point of reference to make dynamic amplitude corrections to the high frequencies.

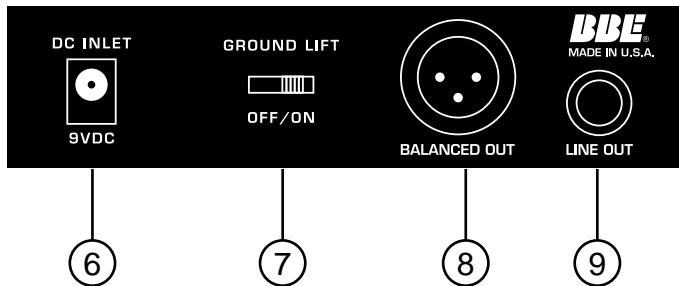
The RMS average loudness detectors continuously monitor both the mid-range and high frequencies to compare the relative harmonic content levels of the two bands and apply the appropriate amount of control voltage to the VCA, thereby determining the amount of high frequency harmonic content present at the final output of the BBE processor.

## FRONT PANEL CONTROLS



- 1. LO CONTOUR CONTROL:** This control adjusts the amount of phase corrected bass frequencies.
- 2. PROCESS CONTROL:** This control adjusts the amount of phase corrected treble frequencies.
- 3. BBE FUNCTION:** This switch allows for the quick comparison of the processed and unprocessed sound.
- 4. INPUT PAD:** This switch allows the user to select between an instrument input (input impedance = 1 MEG OHMs), or a line level input (input impedance = 12k OHMs).
- 5. INPUT JACK:** This is a 1/4" phone jack for signal insertion. Input signal can be from an instrument, or line level from a preamp. Connecting a 1/4" mono phono plug to this input activates the internal 9 volt battery and will power the DI-100 for approximately 100 hours.

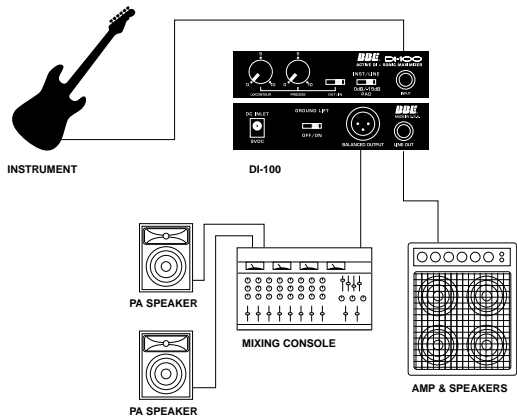
## REAR PANEL CONNECTIONS



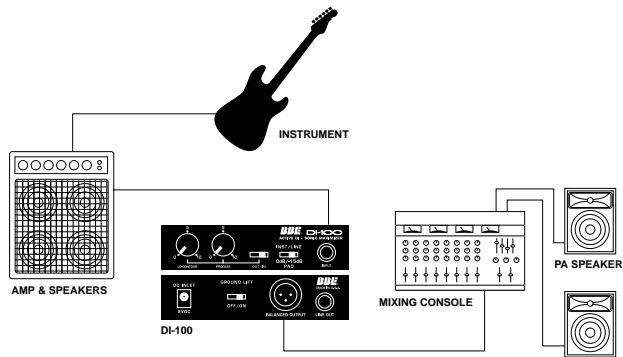
- 6. D.C. INLET:** This jack is for connecting the VDC power source. The 9 VDC power plug must be of the type where the positive voltage is on the outer ring.
  - 7. GROUND LIFT:** This switch is used to lift the units ground connection from pin 3 the XLR balanced output.
  - 8. BALANCED OUTPUT:** This XLR jack provides a mic level, balanced output. Pin 2 being the 'Hot' pin. The DI-100 can also be phantom-powered through this XLR jack.
  - 9. UNBALANCED OUTPUT:** This 1/4" phone jack provides an unbalanced line level output.
- NOTE:** This unit may be powered by three (3) different modes.
- Internal 9 volt battery.
  - 9 VDC external power source.
  - 48v phantom power source.
- NOTE:** When using phantom powering, XLR ground lift must be off.

Here are diagrams of typical setup applications for instrument level and line level.

Typical instrument level application.



Typical line level application.



## SERVICE

We recommend that if at all possible a BBE DI-100 “Active Direct Box with Sonic Maximizer” which requires service be sent to our facility in Huntington Beach, CA. We request that a “RETURN AUTHORIZATION” be issued by the dealer from whom you purchased the unit. If this is not possible, call BBE Sound, Inc. directly at (714) 897-6766, to obtain a “RETURN AUTHORIZATION”. Include a copy of the bill of sale with the unit when it is shipped to BBE Sound, Inc., so that the service process can be expedited.

As the repair turnaround time is minimal, we request that the unit be sent directly to BBE Sound, Inc. This helps us add reliability data to our files for use in designing future products.

## MAINTENANCE

Maintenance of the BBE DI-100 Active Direct Box with Sonic Maximizer is limited to proper cleaning of the unit with a mild household cleaner such as Formula 409™ or Windex™. The chassis and cover are steel finished with a durable polyurethane pain.

## WARRANTY

Warranty registration of the unit to BBE Sound Inc. is not necessary. However, it is strongly recommended that a copy of the bill of sale is retained for future reference.

**IT IS THE SOLE RESPONSIBILITY OF THE END USER TO PROVIDE THE BILL OF SALE OR OTHER MEANS OF PROOF OF PURCHASE TO VALIDATE THE WARRANTY IF WARRANTY SERVICE IS REQUIRED.**

The BBE DI-100 Sonic Maximizer is warranted against defects in material and workmanship for a period of five (5) years from date of purchase from BBE Sound, Inc. or from an authorized dealer.

During this period, we will repair units free of charge providing that they are shipped **prepaid** to BBE Sound, Inc., 5381 Production Drive, Huntington Beach, CA 92649. BBE Sound, Inc. will pay return UPS shipping charges within the USA. All charges related to non-U.S. shipping, including customs clearance, will be billed. The warranty will be honored for the longer of either 90 days from the date of any service or the remainder of the original 5 Year factory warranty.

The warranty will be considered null and void by BBE Sound, Inc. if any of the following is found:

1. The equipment has been physically damaged.
2. The equipment shows signs of abuse.
3. The equipment has been electrically damaged by improper connection or attempted repair by the customer or a third party.
4. The equipment has been modified without authorization.
5. The bill of sale indicates that the purchase date of the equipment is not within the warranty period.

All non-warranty repairs are warranted for a period of 90 days from the date of service.

BBE Sound, Inc. is NOT LIABLE FOR CONSEQUENTIAL DAMAGES. Should the unit fail to operate for any reason, our sole obligation is to repair the unit as described above.

## SPECIFICATIONS

### FREQUENCY RESPONSE

BYPASS ..... .5hz TO 30kHz  
PROCESS ..... PROGRAM CONTROLLED

SIGNAL TO NOISE RATIO (INST.) ..... 100dB PROCESS IN  
USING 9V BATTERY (INST.) ..... 110dB PROCESS OUT  
(LINE) ..... 115dB PROCESS IN  
(LINE) ..... 125dB PROCESS OUT

TOTAL HARMONIC DISTORTION ..... 0.05 % BBE ON (20hz - 20khz)

### INPUT CHARACTERISTICS

INPUT IMPEDANCE ..... 1 MEG OHMS (INST.)  
..... 12k OHMS (LINE)

### OUTPUT CHARACTERISTICS

OUTPUT IMPEDANCE ..... 600 OHMS (XLR)  
..... 1k OHMS (LINE OUTPUT)

### POWER REQUIREMENTS

PHANTOM ..... +48v (VIA XLR JACK)  
D.C. INLET ..... +9vdc MIN. OF 100ma  
BATTERY ..... +9vdc (LIFE OF 100hrs)

Due to continuing product improvement, specifications and design are subject to change without notice.



# **BBE<sup>®</sup>** **Sound Inc.**

5381 Production Drive, Huntington Beach, CA 92649

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Covered by U.S. Patent 4,482,866 and other U.S. and foreign patents pending.

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