

# **OPERATING INSTRUCTIONS**

## **RTD<sup>TM</sup> 31**

**1/3 OCTAVE**

**GRAPHIC EQUALIZER**





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.



Intended to alert the user of the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

**CAUTION:** Risk of electrical shock – DO NOT OPEN!

**CAUTION:** To reduce the risk of electric shock, do not remove cover. No user serviceable parts inside. Refer servicing to qualified service personnel.

**WARNING:** To prevent electrical shock or fire hazard, do not expose this appliance to rain or moisture. Before using this appliance, read the operating guide for further warnings.



Este símbolo tiene el propósito de alertar al usuario de la presencia de "(voltaje) peligroso" que no tiene aislamiento dentro de la caja del producto que puede tener una magnitud suficiente como para constituir riesgo de corrientazo.



Este símbolo tiene el propósito de alertar al usuario de la presencia de instrucciones importantes sobre la operación y mantenimiento en la literatura que viene con el producto.

**PRECAUCION:** Riesgo de corrientazo – No abra.

**PRECAUCION:** Para disminuir el riesgo de corrientazo, no abra la cubierta. No hay piezas adentro que el usuario pueda reparar. Deje todo mantenimiento a los técnicos calificados.

**ADVERTENCIA:** Para evitar corrientazos o peligro de incendio, no deje expuesto a la lluvia o humedad este aparato. Antes de usar este aparato, lea más advertencias en la guía de operación.



Ce symbole est utilisé pour indiquer à l'utilisateur la présence à l'intérieur de ce produit de tension non-isolée dangereuse pouvant être d'intensité suffisante pour constituer un risque de choc électrique.



Ce symbole est utilisé pour indiquer à l'utilisateur qu'il ou qu'elle trouvera d'importantes instructions sur l'utilisation et l'entretien (service) de l'appareil dans la littérature accompagnant le produit.

**ATTENTION:** Risques de choc électrique – NE PAS OUVRIR!

**ATTENTION:** Afin de réduire le risque de choc électrique, ne pas enlever le couvercle. Il ne se trouve à l'intérieur aucune pièce pouvant être réparée par l'utilisateur. Confier l'entretien à un personnel qualifié.

**AVERTISSEMENT:** Afin de prévenir les risques de décharge électrique ou de feu, n'exposez pas cet appareil à la pluie ou à l'humidité. Avant d'utiliser cet appareil, lisez les avertissements supplémentaires situés dans le guide.



Dieses Symbol soll den Anwender vor unisolierten gefährlichen Spannungen innerhalb des Gehäuses warnen, die von Ausreichender Stärke sind, um einen elektrischen Schlag verursachen zu können.



Dieses Symbol soll den Benutzer auf wichtige Instruktionen in der Bedienungsanleitung aufmerksam machen, die Handhabung und Wartung des Produkts betreffen.

**VORSICHT:** Risiko – Elektrischer Schlag! Nicht öffnen!

**VORSICHT:** Um das Risiko eines elektrischen Schlages zu vermeiden, nicht die Abdeckung entfernen. Es befinden sich keine Teile darin, die vom Anwender repariert werden könnten. Reparaturen nur von qualifiziertem Fachpersonal durchführen lassen.

**ACHTUNG:** Um einen elektrischen Schlag oder Feuergefahr zu vermeiden, sollte dieses Gerät nicht dem Regen oder Feuchtigkeit ausgesetzt werden. Vor Inbetriebnahme unbedingt die Bedienungsanleitung lesen.

**WARNING: TO PREVENT ELECTRICAL SHOCK OR FIRE HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE. BEFORE USING THIS APPLIANCE, READ THE OPERATING GUIDE FOR FURTHER WARNINGS.**

## INTRODUCTION

The RTD™ 31 features 31 bands of 1/3 octave filters with dual range capability. The filters are constant "Q" devices, located at standard ISO center frequencies. Effective equalization range is from 20 Hz to 20 kHz.

The compact size, occupying only a single rack space, packs all the right features which give the RTD 31 a clear advantage over the other equalizers in its range. Features such as EQ bypass and Low and High cut "Q" filters are all priceless functions for the business of accurate room equalization, but most important is "headroom"! The RTD 31 is capable of full +24 dBV output which minimizes the possibility of signal clipping (distortion) in the EQ stage of your sound system. With the RTD 31 you can be assured of not only the features and compact size, but also the headroom to keep your system clean.

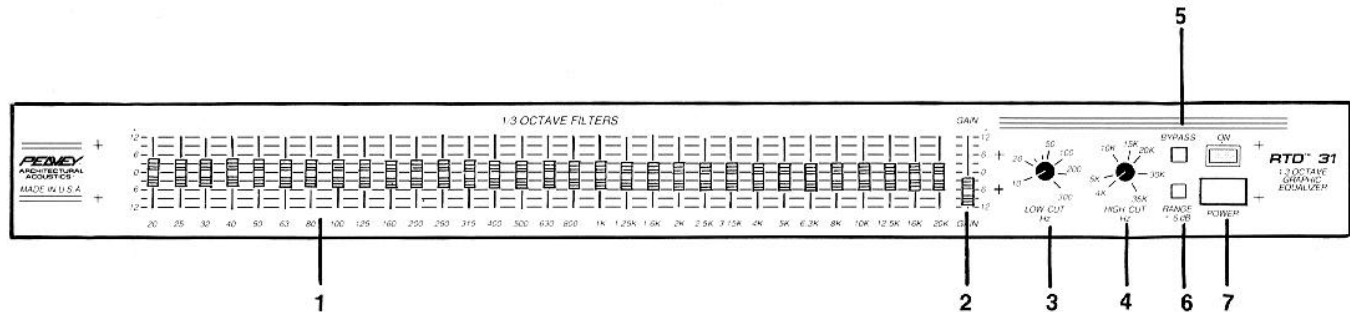
### Application

The RTD 31 has been designed to provide accurate room equalization, feedback control, and system tone control. **NOTE:** All other components in the sound system must be designed for the application and be of the highest quality to maximize results. No amount of equalization will correct an acoustically bad room/mic/speaker arrangement or completely correct the response curve of a poor loudspeaker.

### Equalization Process

The RTD 31 may be used in conjunction with 1/3 octave Real Time Analyzers, or as a "by ear" equalizer. It is highly recommended that an RTA be employed for room tuning,

## Front Panel



### EQUALIZER SECTION (1)

31 bands of 1/3 octave filters with dual range capability. The filters are constant "Q" devices, located at standard ISO center frequencies. Effective equalization range is from 20 Hz to 20 kHz. Normal operation is 12 dB cut or boost (see Range switch).

### GAIN (2)

Calibrated control for regulating overall gain of the equalizer section. Unity gain throughout the signal chain may be maintained by recovering lost signal at this point. **Example:** Assume the equalization process has introduced a signal loss of -6 dB by negative (-) adjustment of the EQ section. The gain should then be adjusted to +6 to maintain unity gain through the equalizer.

### LOW CUT (3)

A high pass filter, continuously variable from 10 Hz to 300 Hz. Low frequency roll off is at 12 dB per octave. Adjust this control to approximate low frequency cut-off of speaker system.

depending, of course, on the particular situation and knowledge of the sound engineer, technician, etc. Simple system tonality adjustments may be accomplished easily by ear at the hands of an experienced sound engineer.

Always begin the equalization process with all sliders in the "0" or "flat" position and avoid excessively cutting large segments of the audio passband, which would limit the system's dynamic range. **EXERCISE CAUTION WHEN ATTEMPTING TO BOOST EQUALIZATION BELOW CUT-OFF OF SPEAKER SYSTEM TRANSDUCERS.** Typical sound reinforcement enclosures are not designed for 20 Hz performance and transducer damage could result from "over-boosting" the low frequencies. Excessive boost at the very low frequencies could also greatly limit overall system headroom.

### OPERATION NOTE

This equalizer is designed to provide room equalization, feedback control, and system tone control. No amount of equalization will correct an acoustically bad room/mic/speaker arrangement or completely correct the response curve of a poor loudspeaker.

Always begin with all sliders in the "0" position and avoid excessively cutting large segments of the audio passband, which would limit the system's dynamic range.

Exercise caution when attempting to boost equalization below cut-off of speaker system. Typical sound reinforcement enclosures are not designed for 20 Hz performance and transducer damage could result.

### FEATURES

- 31 bands of equalization (ISO standard centers)
- Switch-selectable  $\pm 6$  and  $\pm 12$  dB ranges
- Broadband level control
- Quiet power-up and power-down modes
- +24 dBV input and output capability (headroom)
- Single 1 3/4" rack space package

### HIGH CUT (4)

A low pass filter, continuously variable from 4 kHz to 35 kHz. High frequency roll off is at 12 dB per octave. Adjust this control slightly above high frequency system limitation.

### EQ BYPASS (5)

In bypass mode, the input signal is routed directly to the output and is unaffected by all front panel controls except low cut and high cut filters.

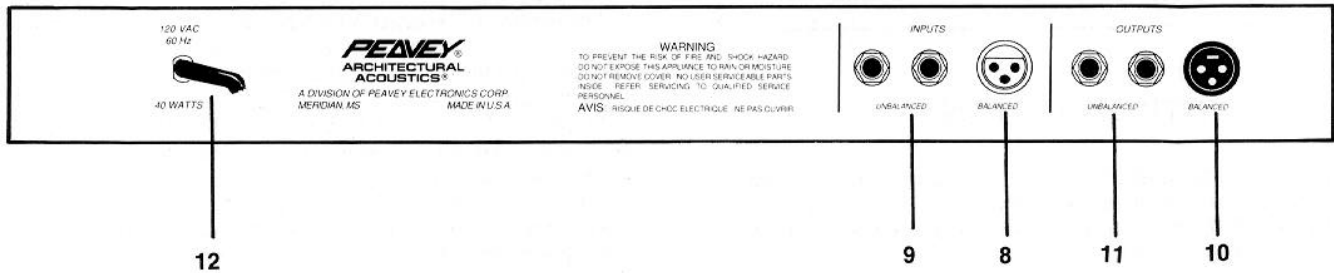
### RANGE ( $\pm 6$ dB, $\pm 12$ dB) (6)

Selects the amount of cut or boost available with equalizer section. Switch position (out) provides  $\pm 12$  dB range. Switch position (in) provides  $\pm 6$  dB operation.

### POWER SWITCH (7)

Depress the switch to the "On" position. The red pilot light (LED) will illuminate indicating power is being supplied to the unit.

## REAR PANEL



### INPUT (BALANCED) (8)

A three-pin female XLR jack is provided for electronically balanced input termination.

### INPUT (UNBALANCED) (9)

Two 1/4" ring-tip-sleeve (stereo) jacks provide balanced inputs when used with stereo (RTS) 1/4" plugs and 2-conductor shielded cables. When used with a mono 1/4" phone plug, the input is unbalanced.

### OPERATION NOTE

Using either of the two 1/4" inputs with a mono phone plug unbalances the other 1/4" input and the XLR input. When one of these inputs is used as a "y-out" to an unbalanced input on another piece of equipment, all the inputs become unbalanced.



### OUTPUT (BALANCED) (10)

A transformer balanced, male XLR output provides line-balancing to other pieces of audio equipment (e.g., power amps). Balanced output is recommended for rejection of hum, noise, and outside interference.

### OUTPUT (UNBALANCED) (11)

Two paralleled 1/4" phone jacks are provided for unbalanced output termination.

### LINE CORD (120V PRODUCTS ONLY) (12)

For your safety, we have incorporated a 3-wire line (mains) cable with proper grounding facilities. It is not advisable to remove the ground pin under any circumstances. If it is necessary to use the equipment without proper grounding facilities, suitable grounding adaptors should be used. Less noise and greatly reduced shock hazard exists when the unit is operated with the proper grounded receptacles.

## SPECIFICATIONS

All specifications are typical unless otherwise noted.

0 dBV = 1 volt

All specifications are referenced to nominal output level (0 dBV) unless otherwise noted.

All measurements are wideband 20 Hz to 20 kHz unless otherwise stated.

**NOTE:** All specs measured at 1V RMS input and unbalanced output. All sliders at mid position, all switches out unless otherwise noted.

### FREQUENCY RESPONSE (Balanced and Unbalanced outputs)

± 1 dB 20 Hz - 20 kHz

### DISTORTION

.003% 20 Hz - 20 kHz

### COMMON MODE REJECTION RATIO (CMRR)

36 dB typical

### INPUT IMPEDANCE

Unbalanced: 20K ohms  
Balanced: 20K ohms (Equal impedances to ground)

### OUTPUT IMPEDANCE

Unbalanced: 100 ohms  
Balanced: 160 ohms

### MAXIMUM INPUT LEVEL

Unbalanced: +24 dBV (15.8V RMS)

Balanced: +24 dBV (15.8V RMS)

### MAXIMUM OUTPUT LEVEL

Unbalanced: +18 dBV (8V RMS)

Balanced: +24 dBV (15.8V RMS)

### NOMINAL INPUT LEVEL

Unbalanced: 0 dBV (1V RMS)

Balanced: 0 dBV (1V RMS)

### NOMINAL OUTPUT LEVEL

Unbalanced: 0 dBV (1V RMS)

Balanced: +6 dBV (2V RMS)

### INPUT HEADROOM

Nominal = 24 dB

### OUTPUT HEADROOM

Unbalanced: 18 dB

Balanced: 18 dB

### OUTPUT NOISE: UNBALANCED OUTPUT

EQ Out: -95 dBV

Q In, all Flat: -95 dBV

### FILTER BANDWIDTH

1/3 octave

### FILTER FREQUENCIES

20, 25, 31.6, 40, 50, 63, 80, 100, 125, 160, 200, 250, 316, 400, 500, 630, 800, 1K, 1.25K, 1.6K, 2K, 2.5K, 3.16K, 4K, 5K, 6.3K, 8K, 10K, 12.5K, 16K, 20K

### FILTER Q

4.77

### MAXIMUM BOOST & CUT FILTERS

± 12 dB (± 12 dB position)

± 6 dB (± 6 dB position)

### MAXIMUM BOOST & CUT GAIN (Wideband gain)

± 12 dB (± 12 dB position)

± 12 dB (± 6 dB position)

### HIGH CUT FILTER: (12 dB per octave frequency)

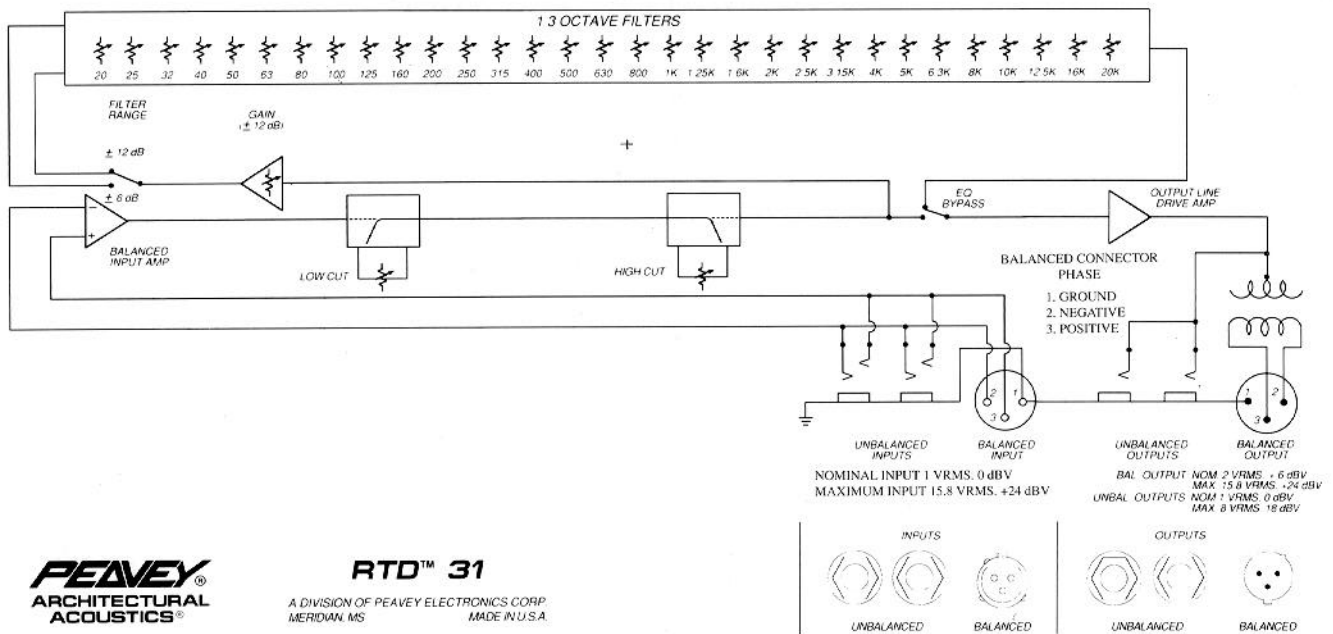
Max: 35 kHz

Min: 4 kHz

### LOW CUT FILTER: (12 dB per octave frequency)

Min: 10 Hz

Max: 400 Hz



**PEAVEY**  
ARCHITECTURAL  
ACOUSTICS

**RTD™ 31**

A DIVISION OF PEAVEY ELECTRONICS CORP  
MERIDIAN, MS MADE IN U.S.A.

## IMPORTANT SAFETY INSTRUCTIONS

**WARNING:** When using electric products, basic cautions should always be followed, including the following.

1. Read all safety and operating instructions before using this product.
2. All safety and operating instructions should be retained for future reference.
3. Obey all cautions in the operating instructions and on the back of the unit.
4. All operating instructions should be followed.
5. This product should not be used near water, i.e., a bathtub, sink, swimming pool, wet basement, etc.
6. This product should be located so that its position does not interfere with its proper ventilation. It should not be placed flat against a wall or placed in a built-in enclosure that will impede the flow of cooling air.
7. This product should not be placed near a source of heat such as a stove, radiator, or another heat producing amplifier.
8. Connect only to a power supply of the type marked on the unit adjacent to the power supply cord.
9. Never break off the ground pin on the power supply cord. For more information on grounding, write for our free booklet "Shock Hazard and Grounding."
10. Power supply cords should always be handled carefully. Never walk or place equipment on power supply cords. Periodically check cords for cuts or signs of stress, especially at the plug and the point where the cord exits the unit.
11. The power supply cord should be unplugged when the unit is to be unused for long periods of time.
12. If this product is to be mounted in an equipment rack, rear support should be provided.
13. Metal parts can be cleaned with a damp rag. The vinyl covering used on some units can be cleaned with a damp rag or an ammonia-based household cleaner if necessary. Disconnect unit from power supply before cleaning.
14. Care should be taken so that objects do not fall and liquids are not spilled into the unit through the ventilation holes or any other openings.
15. This unit should be checked by a qualified service technician if:
  - a. The power supply cord or plug has been damaged.
  - b. Anything has fallen or been spilled into the unit.
  - c. The unit does not operate correctly.
  - d. The unit has been dropped or the enclosure damaged.
16. The user should not attempt to service this equipment. All service work should be done by a qualified service technician.
17. This product should be used only with a cart or stand that is recommended by Peavey Electronics.
18. Exposure to extremely high noise levels may cause a permanent hearing loss. Individuals vary considerably in susceptibility to noise induced hearing loss, but nearly everyone will lose some hearing if exposed to sufficiently intense noise for a sufficient time. The U.S. Government's Occupational Safety and Health Administration (OSHA) has specified the following permissible noise level exposures.

Duration Per Day In Hours	Sound Level dBA, Slow Response
8	90
6	92
4	95
3	97
2	100
1 1/2	102
1	105
1/2	110
1/4 or less	115

According to OSHA, any exposure in excess of the above permissible limits could result in some hearing loss.

Ear plugs or protectors in the ear canals or over the ears must be worn when operating this amplification system in order to prevent a permanent hearing loss if exposure is in excess of the limits as set forth above. To ensure against potentially dangerous exposure to high sound pressure levels, it is recommended that all persons exposed to equipment capable of producing high sound pressure levels such as this amplification system be protected by hearing protectors while this unit is in operation.

**SAVE THESE INSTRUCTIONS!**



**THIS LIMITED WARRANTY VALID ONLY WHEN PURCHASED AND REGISTERED IN THE UNITED STATES OR CANADA. ALL EXPORTED PRODUCTS ARE SUBJECT TO WARRANTY AND SERVICES TO BE SPECIFIED AND PROVIDED BY THE AUTHORIZED DISTRIBUTOR FOR EACH COUNTRY. Ces clauses de garantie ne sont valables qu'aux Etats-Unis et au Canada. Dans tous les autres pays, les clauses de garantie et de maintenance sont fixées par le distributeur national et assurées par lui selon la législation en vigueur. •• Diese Garantie ist nur in den USA und Kanada gültig. Alle Export-Produkte sind der Garantie und dem Service des Importeurs des jeweiligen Landes unterworfen. •• Esta garantía es válida solamente cuando el producto es comprado en E.U. continentales o en Canada. Todos los productos que sean comprados en el extranjero, están sujetos a las garantías y servicio que cada distribuidor autorizado determine y ofrezca en los diferentes países.**

**PEAVEY ONE-YEAR LIMITED WARRANTY/REMEDY**

PEAVEY ELECTRONICS CORPORATION ("PEAVEY") warrants this product, EXCEPT for covers, footswitches, patchcords, tubes and meters, to be free from defects in material and workmanship for a period of one (1) year from date of purchase, PROVIDED, however, that this limited warranty is extended only to the original retail purchaser and is subject to the conditions, exclusions, and limitations hereinafter set forth:

**PEAVEY 90-DAY LIMITED WARRANTY ON TUBES AND METERS**

If this product contains tubes or meters, Peavey warrants the tubes or meters contained in the product to be free from defects in material and workmanship for a period of ninety (90) days from date of purchase; PROVIDED, however, that this limited warranty is extended only to the original retail purchaser and is also subject to the conditions, exclusions, and limitations hereinafter set forth.

**CONDITIONS, EXCLUSIONS, AND LIMITATIONS OF LIMITED WARRANTIES**

These limited warranties shall be void and of no effect, if:

- a. The first purchase of the product is for the purpose of resale; or
- b. The original retail purchase is not made from an AUTHORIZED PEAVEY DEALER; or
- c. The product has been damaged by accident or unreasonable use, neglect, improper service or maintenance, or other causes not arising out of defects in material or workmanship; or
- d. The serial number affixed to the product is altered, defaced, or removed.

In the event of a defect in material and/or workmanship covered by this limited warranty, Peavey will:

- a. In the case of tubes or meters, replace the defective component without charge.
- b. In other covered cases (i.e., cases involving anything other than covers, footswitches, patchcords, tubes or meters), repair the defect in material or workmanship or replace the product, at Peavey's option; and provided, however, that, in any case, all costs of shipping, if necessary, are paid by you, the purchaser.

**THE WARRANTY REGISTRATION CARD SHOULD BE ACCURATELY COMPLETED AND MAILED TO AND RECEIVED BY PEAVEY WITHIN FOURTEEN (14) DAYS FROM THE DATE OF YOUR PURCHASE.**

In order to obtain service under these warranties, you must:

- a. Bring the defective item to any PEAVEY AUTHORIZED DEALER or AUTHORIZED PEAVEY SERVICE CENTER and present therewith the ORIGINAL PROOF OF PURCHASE supplied to you by the AUTHORIZED PEAVEY DEALER in connection with your purchase from him of this product.

If the DEALER or SERVICE CENTER is unable to provide the necessary warranty service you will be directed to the nearest other PEAVEY AUTHORIZED DEALER or AUTHORIZED PEAVEY SERVICE CENTER which can provide such service.

**OR**

- b. Ship the defective item, prepaid, to:

PEAVEY ELECTRONICS CORPORATION  
International Service Center  
326 Hwy. 11 & 80 East  
Meridian, MS 39301

including therewith a complete, detailed description of the problem, together with a legible copy of the original PROOF OF PURCHASE and a complete return address. Upon Peavey's receipt of these items: If the defect is remedial under these limited warranties and the other terms and conditions expressed herein have been complied with, Peavey will provide the necessary warranty service to repair or replace the product and will return it, FREIGHT COLLECT, to you, the purchaser.

Peavey's liability to the purchaser for damages from any cause whatsoever and regardless of the form of action, including negligence, is limited to the actual damages up to the greater of \$500.00 or an amount equal to the purchase price of the product that caused the damage or that is the subject of or is directly related to the cause of action. Such purchase price will be that in effect for the specific product when the cause of action arose. This limitation of liability will not apply to claims for personal injury or damage to real property or tangible personal property allegedly caused by Peavey's negligence. Peavey does not assume liability for personal injury or property damage arising out of or caused by a non-Peavey alteration or attachment, nor does Peavey assume any responsibility for damage to interconnected non-Peavey equipment that may result from the normal functioning and maintenance of the Peavey equipment.

**UNDER NO CIRCUMSTANCES WILL PEAVEY BE LIABLE FOR ANY LOST PROFITS, LOST SAVINGS, ANY INCIDENTAL DAMAGES, OR ANY CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OR INABILITY TO USE THE PRODUCT, EVEN IF PEAVEY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.**

THESE LIMITED WARRANTIES ARE IN LIEU OF ANY AND ALL WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR USE; PROVIDED, HOWEVER, THAT IF THE OTHER TERMS AND CONDITIONS NECESSARY TO THE EXISTENCE OF THE EXPRESSED, LIMITED WARRANTIES, AS HEREINABOVE STATED, HAVE BEEN COMPLIED WITH, IMPLIED WARRANTIES ARE NOT DISCLAIMED DURING THE APPLICABLE ONE-YEAR OR NINETY-DAY PERIOD FROM DATE OF PURCHASE OF THIS PRODUCT.

SOME STATES DO NOT ALLOW LIMITATION ON HOW LONG AN IMPLIED WARRANTY LASTS, OR THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATIONS OR EXCLUSIONS MAY NOT APPLY TO YOU. THESE LIMITED WARRANTIES GIVE YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH MAY VARY FROM STATE TO STATE.

THESE LIMITED WARRANTIES ARE THE ONLY EXPRESSED WARRANTIES ON THIS PRODUCT, AND NO OTHER STATEMENT, REPRESENTATION, WARRANTY, OR AGREEMENT BY ANY PERSON SHALL BE VALID OR BINDING UPON PEAVEY.

In the event of any modification or disclaimer of expressed or implied warranties, or any limitation of remedies, contained herein conflicts with applicable law, then such modification, disclaimer or limitation, as the case may be, shall be deemed to be modified to the extent necessary to comply with such law.

Your remedies for breach of these warranties are limited to those remedies provided herein and Peavey Electronics Corporation gives this limited warranty only with respect to equipment purchased in the United States of America.

**INSTRUCTIONS — WARRANTY REGISTRATION CARD**

1. Mail the completed WARRANTY REGISTRATION CARD to:

PEAVEY ELECTRONICS CORPORATION  
P.O. BOX 2898  
Meridian, MS 39302-2898

- a. Keep the PROOF OF PURCHASE. In the event warranty service is required during the warranty period, you will need this document. There will be no identification card issued by Peavey Electronics Corporation.
2. IMPORTANCE OF WARRANTY REGISTRATION CARDS AND NOTIFICATION OF CHANGES OF ADDRESSES:
  - a. Completion and mailing of WARRANTY REGISTRATION CARDS — Should notification become necessary for any condition that may require correction, the REGISTRATION CARD will help ensure that you are contacted and properly notified.
  - b. Notice of address changes — If you move from the address shown on the WARRANTY REGISTRATION CARD, you should notify Peavey of the change of address so as to facilitate your receipt of any bulletins or other forms of notification which may become necessary in connection with any condition that may require dissemination of information or correction.
3. You may contact Peavey directly by telephoning (601) 483-5365.



Features and specifications subject to change without notice.

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