



# VRS12 VRS18

Passive Subwoofers



**INSTRUCTION MANUAL**

# 1. SAFETY INSTRUCTIONS

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 a 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. Only use attachments/accessories specified by the manufacturer.
10. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as 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.
11. The entire sound system must be designed in compliance with the current standards and laws regarding electrical systems.
12. When installing and using this apparatus, keep in mind the technical specifications indicated in the dedicated section of the manual.
13. Exposure to high sound levels can cause permanent hearing loss. The sound pressure level which leads to hearing loss varies considerably from one person to another, and depends on the duration of exposure. The U.S. Government's Occupational Safety and Health Administration (OSHA) has established the maximum sound pressure levels that can be with stood without causing damage, which are shown in the table below. According to the OSHA regulations, any exposure over the maximum limits indicated in the table can reduce the hearing capacity of a person. To prevent potentially dangerous exposure to high sound pressure levels, anyone subjected to such levels must use suitable protection. When a EAW Commercial product capable of producing high sound levels is being used, it is therefore necessary to wear ear plugs or protective earphones when the limits shown in the table are exceeded. Consult the specifications provided in the instruction manual to know the maximum sound pressure (SPL) the loudspeaker is capable of producing.



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



**WARNING!** *This equipment has been designed to be installed by qualified professionals only! There are many factors to be considered when installing professional sound reinforcement systems, including mechanical and electrical considerations, as well as acoustic coverage and performance. EAW Commercial strongly recommends that this equipment be installed only by a professional sound installer or contractor.*

Duration per day (hours)	Sound level (dBA)	Typical example
8	90	Duo in a small club
6	92	
4	95	Subway train
3	97	
2	100	Very loud classical music
1.5	102	
1	105	Locomotive at 50 feet
0.5	110	
0.25 or less	115	Loudest parts at a rock concert

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14. Rigging Precautions: When mounting or suspending EAW Commercial loudspeaker enclosures, it is essential that load ratings, rigging techniques, and special safety considerations be appropriate for the installation. Use only the mounting/rigging points on the loudspeaker enclosure intended for this purpose. The user must determine the load requirements, dynamic loading, and any other contributing factors affecting the loudspeaker installation. The user must determine the proper design factor for specific applications and the required load rating of the connection to structure. Comply with all applicable federal, state, and local regulations.

EAW Commercial strongly recommends the following rigging system practices:

- Documentation: Thoroughly document the mounting/rigging design with detailed drawings and parts lists.
- Analysis: Have a licensed structural engineer or other qualified professional review and approve the mounting/rigging design before its implementation.
- Installation: Use personnel experienced and qualified for mounting/rigging loudspeakers in accordance with and in compliance with all federal, state and local regulations.



**DANGER:** Loudspeakers should be mounted or suspended only by persons with knowledge of the proper hardware and rigging techniques. When stacking or pole-mounting loudspeakers, be sure that they are stabilized and secured from falling over or being accidentally pushed over. Failure to follow these precautions may result in damage to the equipment, personal injury, or death.

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## 2. INTRODUCTION

Congratulations on the purchase of your new EAW Commercial loudspeaker. You now own one of the finest professional audio products available – the result of exceptional engineering and meticulous craftsmanship. Please read these instructions to get the maximum performance from your new loudspeaker.

Each EAW Commercial loudspeaker is intended for professional use. The construction, components, and hardware have been designed to provide robust, reliable performance for its intended application. Please ensure that you fully understand its proper installation and operation before use.

This manual describes the VRS12 and VRS18 passive subwoofers. They are ideal for applications where maximum low-frequency impact is required. Both subwoofers provide high output, authoritative bass response for the lowest musical octaves.

The VRS12 is especially suited for installations where space is restricted. It is 15.5 inches/394 mm high when mounted on its side, and is very effective where subwoofers must be installed under a low stage.

The VRS12 and VRS18 enclosures are the same height as the VR21 and VR51 full-range loudspeakers. Because of this, attractive arrays can be created with a single VRS12 or VRS18 between two VR21s or two VR51s.

The rugged enclosure is available in both black and white finishes. It includes a number of threaded points for use with forged shoulder eyebolts. The powder-coated steel grille is foam-backed, providing physical protection for the drivers as well as hiding them from view.

### Features:

- Companion subwoofer for all VR Series loudspeakers
- VRS12 has two 12-inch subwoofers in a vented enclosure
- VRS18 has one 18-inch subwoofer in a vented enclosure
- VRS12 (on its side) is ideal for installation under low stages
- VRS18 (and VRS12 upright) are the same height as VR21 and VR51 full-range loudspeakers
- Forms an attractive flown array with the VR21 and VR51 using optional brackets
- Five-year warranty

### Applications include:

- Houses of Worship
- Presentation/Meeting Rooms
- Performing Arts Centers
- Night Clubs
- Theaters
- Multi-media Systems
- Theme Parks
- Retail Spaces

# 3. INSTALLATION

## Unpacking and Inspection

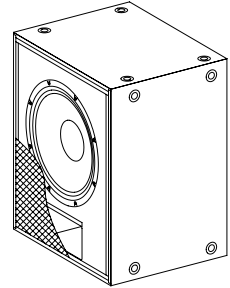
Visually inspect the outside of the shipping carton and check for any shipping damage. After unpacking, if you find concealed damage to the loudspeaker, save the packing materials for the carrier's inspection, notify the carrier immediately, and file a shipping damage claim. Although EAW Commercial will help in any way possible, it is always the responsibility of the receiving party to file any shipping damage claim. The carrier will help prepare and file this claim.

## Mounting Precautions

The loudspeaker is fitted with threaded mounting holes, suitable for attaching user-supplied forged shoulder eyebolts and flying hardware. The details of the mounting points are shown in the drawings on page 10.



**WARNING:** Installation should only be done by an experienced technician. Improper installation may result in damage to the equipment, injury or death. Make sure that the loudspeaker is installed in a stable and secure way in order to avoid any conditions that may be dangerous for persons or structures:



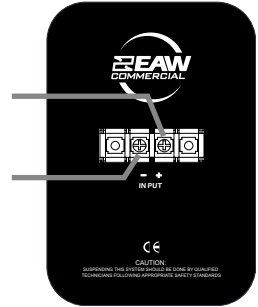
- Check to make sure that the support surface (e.g., wall, etc.) has the necessary mechanical characteristics to support the weight of the loudspeaker without the danger of it falling.
- Always use support elements suitable for the material of the wall that will support the loudspeaker (e.g., screw anchors for bricks, screw anchors for cement, etc.). Consult a building professional for the proper mounting hardware.
- Before suspending the loudspeaker, carefully check all the components to be used to make sure there is no damage, deformation, corrosion and/or missing or damaged parts that could reduce the safety of the installation.
- Consult a professional rigger or structural engineer prior to suspending loudspeakers from a structure not intended for that use. Always know the working load limit of the structure supporting the loudspeaker. Always make sure that the rigging hardware minimum rating is at least five times the actual load.
- Avoid installing the loudspeaker in places exposed to harsh weather conditions.

# 4. CONNECTIONS



**WARNING:** To prevent the risk of electric shock, do not connect the loudspeaker with the amplifier switched on. The protective cover over the terminal strip is a safety feature per CE requirements. Replace this cover after making the signal connections.

1. Remove the insulating cover from the loudspeaker input terminal strip.
2. The positive (+) input terminal of the loudspeaker connects to the positive (+) output of your power amplifier.
3. The negative (-) terminal of the loudspeaker connects to the negative (-) output of your power amplifier.
4. Using a small phillips screwdriver, secure the connections.
5. Replace the insulating cover over the loudspeaker input terminal strip.



## Loudspeaker Cables

- Use loudspeaker cables with a minimum conductor size for the length you need as listed in these tables. This will minimize power losses to less than 0.5 dB. The cable lengths listed are “up to” lengths. For in-between lengths, use the next larger conductor gauge. Using larger than the recommended conductor size is always permissible. Using smaller than recommended conductor size will result in higher power losses.
- The recommended conductor gauges are listed for AWG (American Wire Gauge) and Metric WG (Metric Wire Gauge). Note that smaller AWG numbers = larger conductors and smaller Metric WG numbers = smaller conductors. The Metric WG is equal to ten times the nominal conductor diameter in millimeters.
- For cable lengths over 200 feet / 60 m at 8 ohms, and over 100 feet / 30 m at 4 ohms, the conductor sizes needed for less than 0.5 dB power losses are rarely practical for physical and cost reasons. As a practical compromise for these situations the recommended conductor gauge is 10 AWG or 25 metric.

Minimum AWG	4 ohm	8 ohm
18	10 ft	25 ft
16	25	50
14	25	75
12	50	125
10	100	200

Min Metric WG	4 ohm	8 ohm
12	3 m	8 m
14	8	15
16	8	25
20	15	40
25	30	60



## Precautions

- To prevent inductive phenomena causing humming or distortion, the speaker cables should not be run together with electrical energy conductors, microphone cables, or line-level audio lines.
- Use speaker cables that have markings to distinguish the polarity, such as insulation or conductors of different colors.
- Before using the loudspeaker, carefully check that all the connections have been made correctly to make sure there are no accidental short circuits that could cause electrical sparks.
- Verify that the polarity of the connections to all of your loudspeakers is correct. When more than one loudspeaker reproduces the same frequencies, but with opposite polarity, there will be sound cancellations. Therefore, if any of the loudspeakers are wired so that the +/- connection polarity is reversed with respect to the others, incorrect reproduction will result. Most notably, the bass response will suffer. This is especially true when loudspeakers are situated in adjacent positions where the sound waves readily interact with each other.

# 5. OPERATION

## Signal Processing

The loudspeakers have no internal crossover, allowing maximum power transfer to the woofers. External signal processing is required to shape the line-level signals before they reach your power amplifier. The recommended high-pass, low-pass, and EQ setting are shown in the specifications table on the next page.

## Choosing a Power Amplifier

There is no exact answer to the question of what amplifier size you should use for a loudspeaker. The loudspeaker power rating in EAW Commercial's specifications only means it has passed a standard power test. This provides a rating that can be used as a point of comparison with other loudspeakers. This rating does not necessarily correspond to the best amplifier size to use nor is it a measure of a "safe" amplifier size to use. Rather, the amplifier should be sized according to both the sound levels required and the type of audio signals that will be reproduced. If you are unsure of how to determine this, consult with a qualified professional or contact EAW Commercial Technical Support.

Preventing damage to the loudspeaker is a function of operating your audio system so that the loudspeaker is not stressed beyond its design limits.

## Operating Tips

- Do NOT drive any of your electronic equipment into clipping, particularly the power amplifiers. This can easily damage the loudspeaker.
- If driven into clipping, even an amplifier with a power output rating lower than the loudspeaker's power rating can cause damage to a loudspeaker.
- Avoid sustained microphone feedback. This can quickly cause failure of high-frequency drivers in your system.
- Avoid extreme boosts on equalizers as these can cause excessive input to the drivers at the boosted frequencies. Generally, cutting frequencies is preferred to adjust the frequency response.
- With appropriate signal processing, your loudspeaker should produce exceptionally good sound. If it is used in a room with problematic acoustics, there is little you can do to overcome the room problems with electronic adjustments. Your best solution is careful placement and aiming of the loudspeaker so most of the sound is directed only at the audience.
- Most EAW Commercial loudspeakers are capable of sound levels that can be damaging to human hearing. Take precautions so that audiences are not exposed to such levels. If you must expose yourself to these kinds of volume levels, wear adequate hearing protection.
- Take care when moving or lifting the loudspeaker. Injury to you or damage to the loudspeaker can result from careless handling.



# 6. SPECIFICATIONS

Model	VRS12	VRS18
<b>Woofer</b>	12" x 2	18" x 1
<b>Woofer Loading</b>	Bass reflex	Bass reflex
<b>Operating Range (processed, -10 dB)</b>	32 Hz - 150 Hz	31 Hz - 145 Hz
<b>Axial Sensitivity (whole space SPL)</b>	92 dB, 32 Hz to 150 Hz	93 dB, 31 Hz to 145 Hz
<b>Peak Sensitivity (whole space SPL)</b>	101 dB, 20 Hz to 20 kHz	98 dB, 20 Hz to 20 kHz
<b>Input Impedance - Nominal</b>	4 ohm	8 ohm
<b>Input Impedance - Minimum</b>	4.4 ohm @ 150 Hz	9.1 ohm @ 110 Hz
<b>Power Handling</b>	500 W, 45 V @ 4ohms	500 W, 64 V @ 8 ohms
<b>Maximum SPL, Average</b>	119 dB	120 dB
<b>Maximum SPL, Peak</b>	125 dB	126 dB
<b>Recommended High-Pass</b>	≥ 25 Hz, 24 dB/octave Butterworth	≥ 25 Hz, 24 dB/octave Butterworth
<b>Recommended Low-Pass</b>	100 Hz, 24 dB/octave Butterworth	100 Hz, 24 dB/octave Butterworth
<b>Highest Recommended Low-Pass</b>	200 Hz	150 Hz
<b>Recommended EQ</b>	46 Hz, +4 dB, Q=1.6	50 Hz, +3 dB, Q=2
<b>Height</b>	30.00 in/762 mm	30.00 in/762 mm
<b>Width</b>	15.50 in/393.7 mm	24.56 in/623.8 mm
<b>Depth</b>	30.65 in/778.4 mm	20.27 in/514.8 mm
<b>Dimension Tolerance</b>	± 0.1 in/ 2.5 mm	± 0.1 in/ 2.5 mm
<b>Weight</b>	85 lb/38.5 kg	80 lb/36.3 kg

## Disclaimer

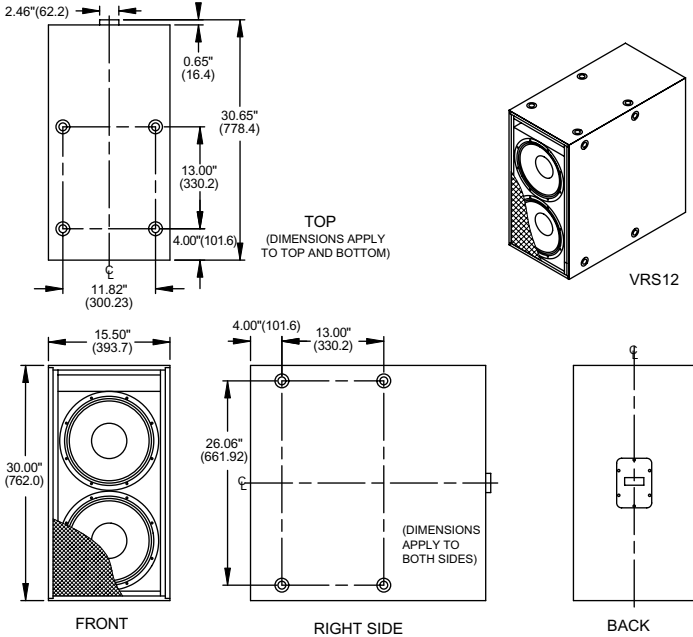
EAW Commercial continually engages in research related to product improvement, new materials, and production methods. Design refinements are introduced into existing products without notice as a routine expression of that philosophy. For this reason, any current EAW Commercial product may differ in some respect from its published description, but will always equal or exceed the original design specifications unless otherwise stated.

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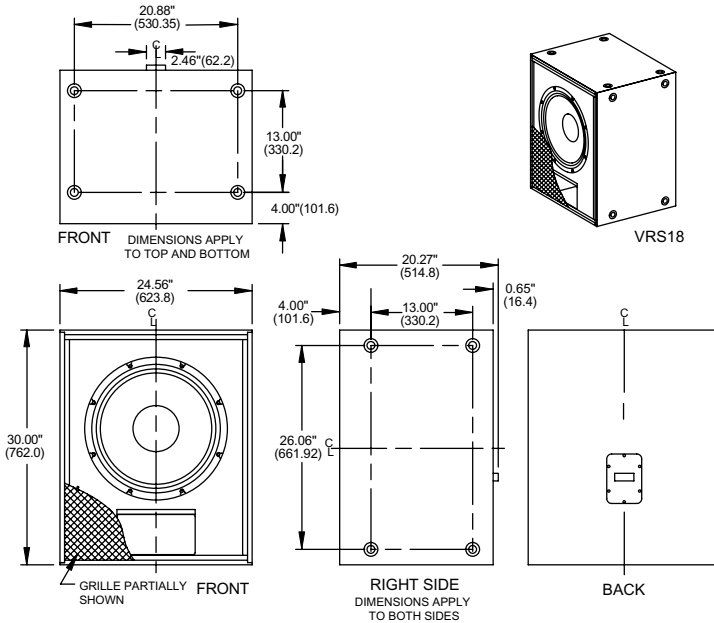


# VRS12 Dimensions and Mounting Points



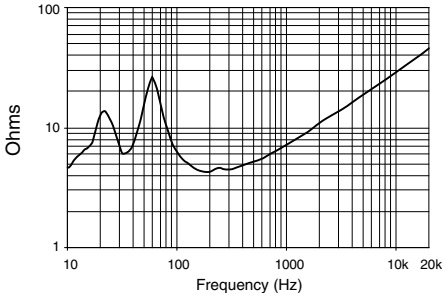
- NOTES:
1. DIMENSIONS ARE IN INCHES, DIMENSIONS IN BRACKETS ARE MILLIMETERS.
  2. DIMENSION TOLERANCE IS  $\pm 0.1"$  (2.5 MM)
  3. SYMBOL  $\odot$  INDICATES MOUNTING POINT, 3/8 INCH-16 THREADED HOLE (PI ANGLE)

# VRS18 Dimensions and Mounting Points

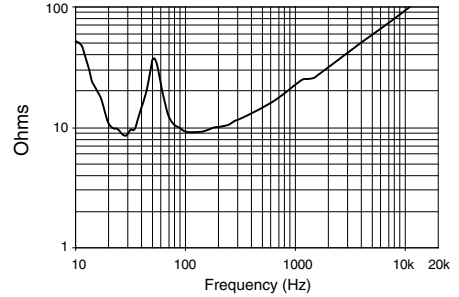


# PERFORMANCE GRAPHS

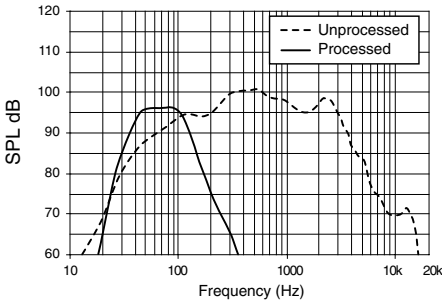
## VRS12 Impedance vs Frequency



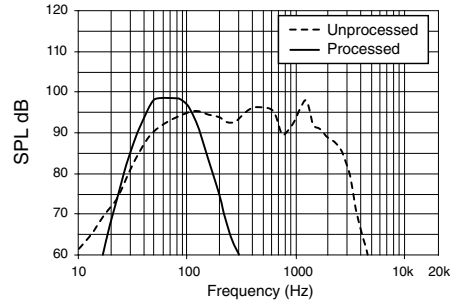
## VRS18 Impedance vs Frequency



## VRS12 Axial Response vs Frequency

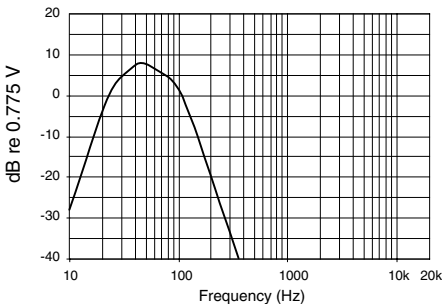


## VRS18 Axial Response vs Frequency



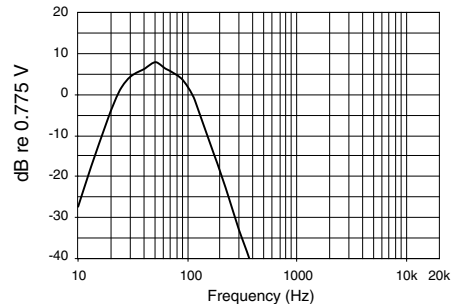
**Processed:** Before amplification, the audio signal is processed by the recommended high-pass, low-pass and EQ settings (see below).

## VRS12 Recommended Processor Response



**High-pass:** 25 Hz, 24 dB/octave Butterworth  
**Low-pass:** 100 Hz, 24 dB/octave Butterworth  
**EQ:** 46 Hz, Gain 4 dB, Q=1.5

## VRS18 Recommended Processor Response



**High-pass:** 25 Hz, 24 dB/octave Butterworth  
**Low-pass:** 100 Hz, 24 dB/octave Butterworth  
**EQ:** 50 Hz, Gain 3 dB, Q=2



# 7. TROUBLESHOOTING

Loudspeaker difficulties usually fall into one of the following categories. The causes for each are listed in the most likely order of probability.

## No Sound or Low Output

- Loudspeaker cables or connectors are not wired correctly or are faulty. Check all cabling, referring to these instructions for the correct connections. The best way to check a suspect cable is to swap it with a known good cable. Check the loudspeaker's input panel to verify correct cable connections.
- Electronic equipment is not turned on, or the level controls are not adjusted properly. Make sure that all equipment in the signal path is powered up, and that all controls are set to appropriate levels for normal operation.
- Loudspeaker is not working. Connect the loudspeaker cable to a known good loudspeaker, leaving all equipment set to the same levels. If the problem disappears, the loudspeaker is probably not working. Contact EAW Commercial Technical Support for appropriate troubleshooting.

## Distorted Sound

- The power amplifier is clipping. The signal level is exceeding the limits of your system and you must reduce the level.
- Other electronic equipment is being overdriven. Ensure that no equipment in the signal chain is being over driven. For example: input(s) or summing bus in the mixing console, equalizers etc.
- Driver(s) not working properly. Contact EAW Commercial Technical Support for appropriate troubleshooting.

## Partial Sound (frequency band missing)

- Incorrect EQ settings in the electronic equipment. Ensure that all EQ settings and filters on the mixing console, preamplifier, or other equipment are set for normal operation. Ensure that level controls on electronic crossovers and associated amplifiers are correctly set, and that all cables and connections for such equipment are connected and working properly.
- Driver not working properly. Contact EAW Commercial Technical Support for appropriate troubleshooting.

# 8. SERVICE and MAINTENANCE

## Maintenance

Usually, your EAW Commercial loudspeaker will not require regular maintenance for normal use. However, you can do several things to keep your loudspeaker in good operating and cosmetic condition.

- **Testing:** Periodically test your loudspeaker for proper performance. A simple test is to play a CD through it using well-defined, articulate, wide-range program material. Listen to ensure all drivers are working properly and for any evidence of distortion or other extraneous sounds. Test at several volume levels: very low, normal, and high.
- **Mounting/Rigging:** Any mounting or rigging hardware should be regularly inspected for security, wear, deformation, corrosion, and any other circumstances that may affect the load-handling capability. Immediately remove from service and replace any hardware whose load-handling capability may be compromised.
- **Cleaning:** Cleaning the exterior of the enclosure will depend on the type of "dirt." Dust, food spills, or similar contaminants can usually be removed with a cloth dampened with water, or a mild household cleaner. Avoid using any strong solvents as this may damage the finish. Turn the amplifiers off before cleaning.
- **Scratches or Dents in Wood Enclosures:** Minor scratches on the enclosure can be painted over with an outdoor latex paint, or simply colored in with a "Sharpie" or artist's marking pen. More serious gouges or dents should be sanded out, filled with wood putty, and repainted. Touch-up paint in pints and quarts is available through EAW Commercial Technical Support.

## Service

If your loudspeaker should require servicing, please follow these instructions:

1. Call EAW Commercial Tech Support at 1-888-337-7404, 7 am to 5 pm PST (Monday-Friday), to verify the problem and obtain a Service Request Number. Be sure to have the serial number of the unit when you call. You must have a Service Request Number in order to obtain warranty service at the factory or at an authorized service center. You can also email EAW Commercial Tech Support at: [support@eawcommercial.com](mailto:support@eawcommercial.com)
2. Pack the unit in its original packaging. **THIS IS VERY IMPORTANT.** LOUD Technologies is not responsible for any damage that occurs during shipping due to non-conventional packaging. Original packaging helps to minimize the possibility of shipping damage.
3. Include a legible note stating your name, (no P.O. boxes), daytime phone number, Service Request Number, and a detailed description of the problem, including how we can duplicate it.
4. Write the Service Request Number in **BIG BOLD PRINT** on top of the box.
5. Tech Support will tell you where to ship the unit when you call for a Service Request Number. We suggest insurance for all forms of cartage.

### EAW Commercial Technical Support

Phone (USA/Canada)	888-337-7404
Phone	425-892-6503
Fax	425-485-1152
Address	One Main Street Whitinsville, MA 01588
Web site	<a href="http://www.eawcommercial.com">www.eawcommercial.com</a>
e-mail	<a href="mailto:support@eawcommercial.com">support@eawcommercial.com</a>

# 9. WARRANTY

**Warranty:** LOUD Technologies Inc. requires its authorized EAW Commercial distributors abide by the following warranty terms for all EAW Commercial brand products (all dates are from the date of delivery from an Authorized EAW Commercial Distributor to the end user/installation site):

Loudspeakers – 5 years; Active Electronics – 5 years; Accessories – 2 years.

**What Is Covered:** Defects in workmanship and materials and against malfunctions. EAW Commercial distributors must remedy all such defects and malfunctions without charge for parts or labor if the warranty applies. Final determination of warranty coverage lies solely with each authorized EAW Commercial distributor.

**What Is Not Covered:** This warranty does not extend to damage or malfunctions resulting from, but not limited to, shipment, improper installation, misuse, neglect, abuse, normal wear, accident, or to any product on which the serial number has been modified or removed. Exterior defects in or damage to the exterior appearance are specifically excluded from this warranty. EAW Commercial distributors shall not be liable for incidental or consequential damages resulting from the use of EAW Commercial products. Repairs and/or modifications by other than an Authorized EAW Commercial Distributor automatically voids this warranty.



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