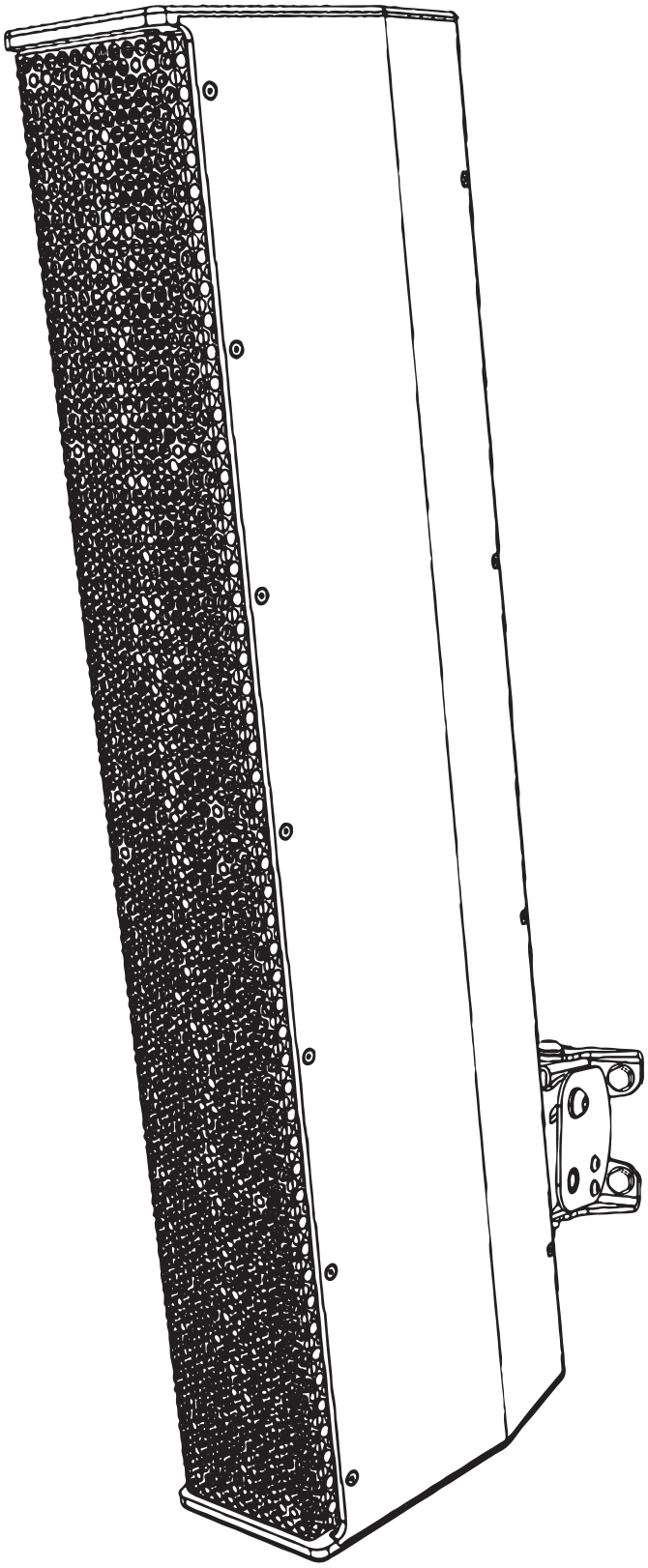
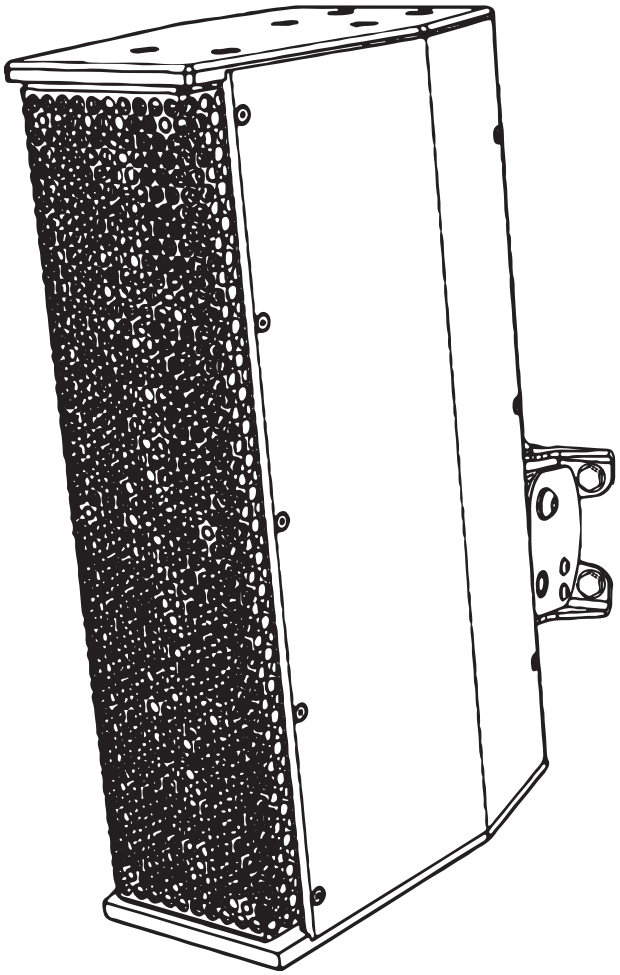
1 SOUND





Tower Series LCC44/LCC84 Wall Installation

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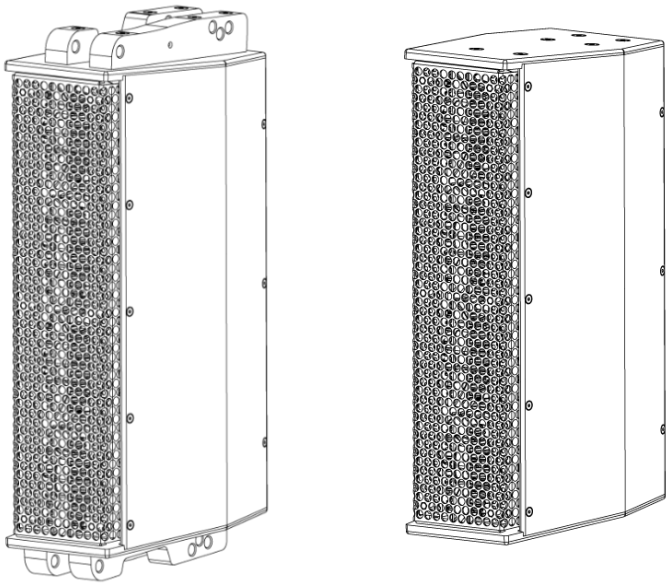
Chapter 1. Speaker models

TOWER LCC44

Cardioid Column Line Array Enclosure

Figure 1. LCC44 with Tower Rigging System (left), and without.



Tower LCC44 is a cardioid line array element featuring designed to be compact, high powered and array-able. The enclosure features Clarity Technology©, a proprietary high frequency technology built around four coaxial transducers each composed of a 4" cone driver and a compression driver. The enclosure provides 120° horizontal coverage on axis. Three additional rear 4" full-range transducers allow the unit to provide a cardioid dispersion pattern with -20 dB rear cancellation. The Towers can be deployed independently or combined using the proprietary Tower Rigging System to create long column arrays. Each LCC44 unit requires two amplifier channels operating with a dedicated DSP preset in order to achieve the cardioid dispersion pattern.

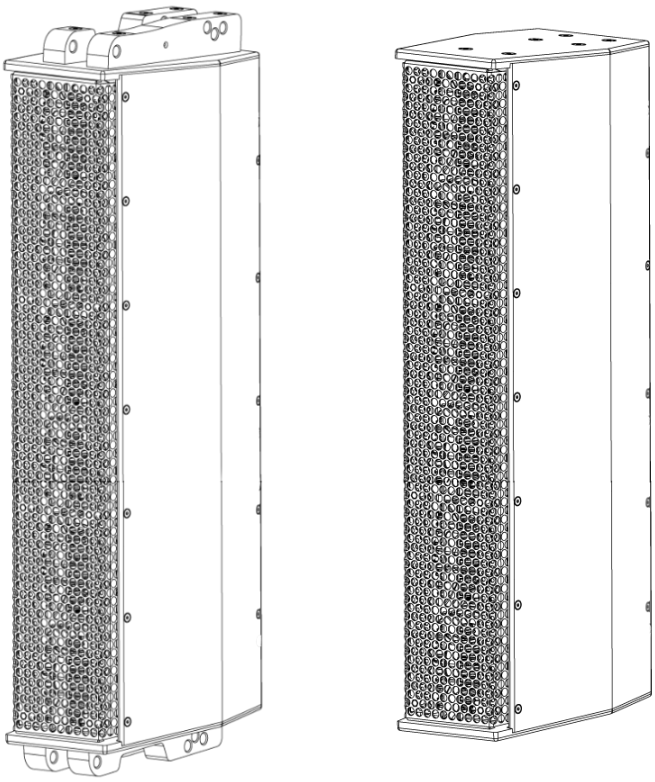
TOWER LCC44 Specifications

Description	Cardioid line array column featuring Clarity Technology© high frequency
Bandwidth	105 Hz – 18 kHz (-6 dB)
Max SPL	123 dB SPL @ 1 m w/ preset (1 unit)
Power	800 watts front + 400 watts rear (continuous), 400 watts + 200 watts (AES)
Directivity	120° horizontal
Elements	(4) 4" coaxial each with a 1.4" compression driver, (3) 4" rear-facing full range
Impedance	16 Ω front speakers, 24 Ω rear speakers
Connectors	(4) NL4, 1+/1- front, 2+/2- rear, each allowing for audio inputs and linking
IP Rating	IP55 indoor/outdoor and salt water resistant
Rigging	Proprietary rigging elements and fly bars -3°, 0°, +3°, +6°, +9°; (14) available M6 points
Weight	22 lb / 10 kg
Construction	Finland birch plywood (phenolic glue), structural stainless steel interior, polyurea, clear matte salt and UV resistant coating, 316 stainless steel hardware, 3D spacer mesh fabric
Accessories	LCC44 Wall Bracket, Tower Tube Mount, Tower Rigging System, Fly Bar (Long & Short), Active Speaker Tube (various lengths)
Dimensions	17.8" (452 mm) x 6.3" (160 mm) x 9.5" (240 mm)
Colors	Stocking black and white, custom colors and fabrics available

TOWER LCC84

Cardioid Column Line Array Enclosure

Figure 2. LCC84 with Tower Rigging System (left), and without.



Tower LCC84 is a cardioid line array element featuring designed to be compact, high powered and array-able. The enclosure features Clarity Technology©, a proprietary high frequency technology built around eight coaxial transducers each composed of a 4" cone driver and a compression driver. The enclosure provides 120° horizontal coverage on axis. Six additional rear 4" full-range transducers allow the unit to provide a cardioid dispersion pattern with -20 dB rear cancellation. The Towers can be deployed independently or combined using the proprietary Tower Rigging System to create long column arrays. Each LCC84 unit requires two amplifier channels operating with a dedicated DSP preset in order to achieve the cardioid dispersion pattern.

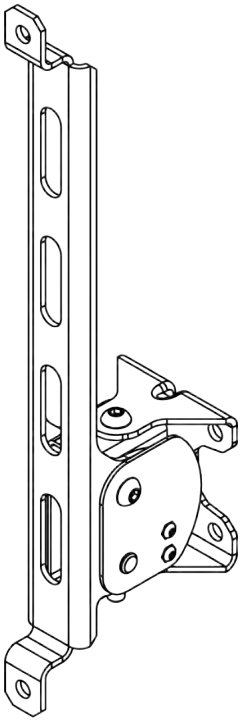
TOWER LCC84 Specifications

Description	Cardioid line array column featuring Clarity Technology© high frequency
Bandwidth	105 Hz – 18 kHz (-6 dB)
Max SPL	127 dB SPL @ 1 m w/ preset (1 speaker)
Power	1600 watts front + 800 watts rear (continuous), 800 watts + 400 watts (AES)
Directivity	120° horizontal
Elements	(8) 4" coaxial each with a 1.4" compression driver, (6) 4" rear-facing full range
Impedance	8 Ω front, 12 Ω rear
Connectors	(4) NL4, 1+/1- front speakers, 2+/2- rear speakers, each allowing for audio inputs and linking
IP Rating	IP55 indoor/outdoor and salt water resistant
Rigging	proprietary rigging elements and fly bars -3°, 0°, +3°, +6°, +9°; (14) available M6 points
Weight	43 lb / 19.5 kg
Construction	Finland birch plywood (phenolic glue), structural stainless steel interior, polyurea, clear matte salt- and UV-resistant coating, 316 stainless steel hardware, 3D spacer mesh fabric
Accessories	LCC84 Wall Bracket, Tower Tube Mount, Tower Rigging System, Active Speaker Tube
Physical	36.8" (934 mm) x 6.3" (160 mm) x 9.5" (240 mm)
Colors	Stocking black and white, custom colors and fabrics available

Chapter 2. Accessories

LCC44 Wall Bracket

Figure 3. LCC44 Wall Bracket



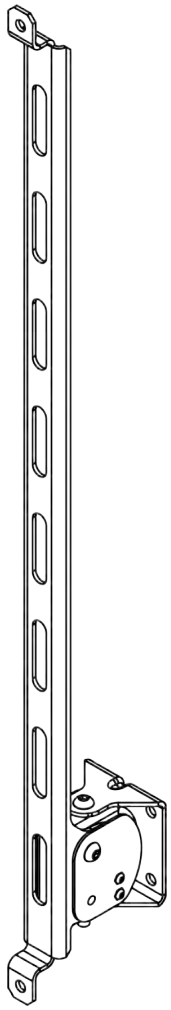
The LCC44 Wall Bracket attaches to an LCC44 Tower loudspeaker in order to mount to a wall or ceiling. To provide versatility in terms of installation and to adapt to the coverage requirements of the speaker enclosure, the bracket is articulated on two axes, with 180° (±90°) horizontal orientation and 40° of vertical tilt. The bracket is designed to facilitate installation by a single person and is available with a black or white finish as standard.

The kit includes:

- The assembled wall bracket

LCC84 Wall Bracket

Figure 4. LCC84 Wall Bracket



The LCC84 Wall Bracket attaches to an LCC84 Tower loudspeaker in order to mount to a wall or ceiling. To provide versatility in terms of installation and to adapt to the coverage requirements of the speaker enclosure, the bracket is articulated on two axes, with 180° (±90°) horizontal orientation and 40° of vertical tilt. The bracket is designed to facilitate installation by a single person and is available with a black or white finish as standard.

The kit includes:

- The assembled wall bracket

Chapter 3. Installing LCC44/LCC84 on a Wall Mount Bracket

Critical information

Attention: This wall-mount bracket is intended for installation by qualified professionals.

Notice: Please read these instructions carefully and completely before attempting installation.

⚠ WARNING

Improper installation or suspension of any heavy load can result in death or serious injury to persons, as well as damage to property.
It is the responsibility of the installation personnel to verify and guaranty the reliability and safety of the installation.

Notice: This product must be installed in compliance with all applicable local, state and national regulatory provisions. The responsibility rests with the installer to verify that the installation is carried out in accordance with any applicable legislation.

Important: The installer must assess the appropriate stability and sturdiness of the mounting surface. In the case of wall-mount and ceiling-mount brackets, this includes, but is not limited to verifying the positions of suitable studs in the case of drywall mounts, hollow points in concrete block or solid concrete, as well as the presence and vicinity of electrical wiring or plumbing.

Restriction: Only hardware and accessories included with the product or specified by 1 Sound should be used for its installation.

Restriction: Do not modify or alter the loudspeaker or any accessory. Any modification by the user or installer could render the product or the installation unsafe.

Restriction: Do not install a loudspeaker or any accessory near any open flame or heat source.

Products, accessories and tools required

To install an LCC44 or LCC84 enclosure permanently on a wall or surface you will need the following:

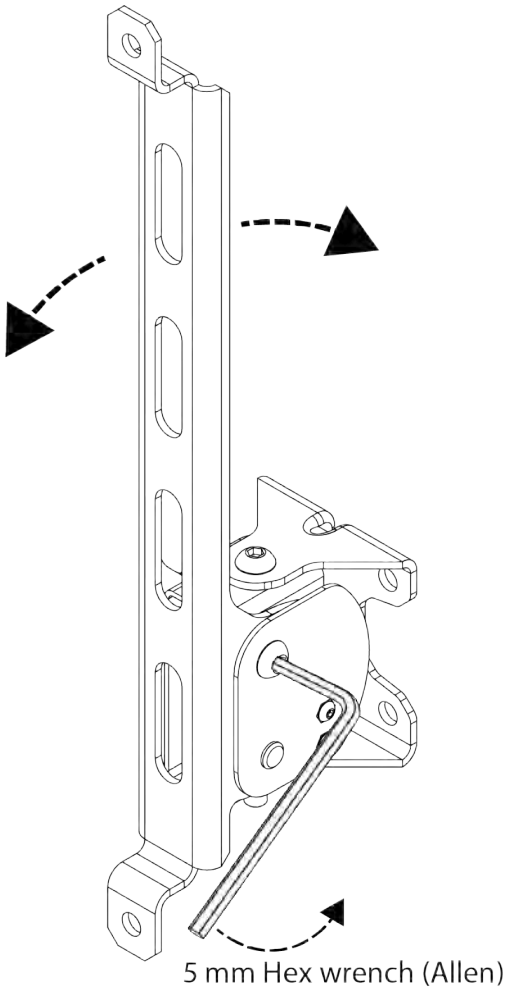
- An LCC44 *(on page 3)* or LCC84 *(on page 3)* loudspeaker enclosure
- The corresponding LCC44 *(on page 4)* or LCC84 Wall Mount Bracket *(on page 4)* kit
- An appropriate power drill and bit for the installation surface material
- A 5 mm hex (Allen) wrench
- Medium-duty mounting screws or bolts appropriate to the mounting surface (coach screws for drywall studs, concrete screw anchors for concrete or masonry, etc.); screws and bolts should have a flanged head or a coupled washer ø14-16 mm in order to retain the mounting plate
- Appropriate tools for securing the aforementioned fasteners (power screwdriver etc.)
- A Torque wrench
- Optional: 4 mm hex (Allen) wrench, steel rope sling or chain, M6 lifting eye bolt (shouldered type); eye bolt spanner or driver
- **Recommended**: pencil or marker, spirit level, stud finder

Procedures

Disassembling the bracket

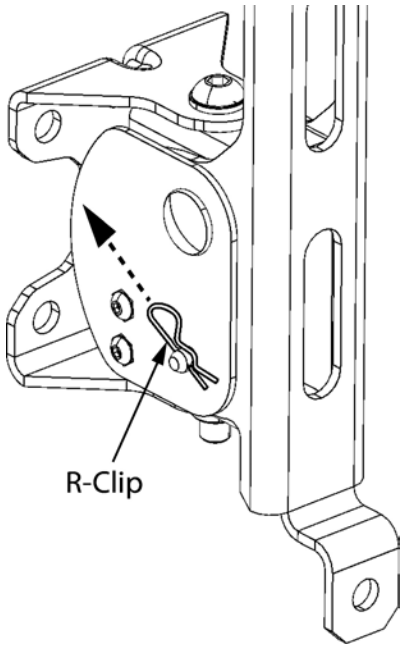
The Wall Mount Bracket ships fully assembled, but to facilitate installation, it should first be separated into two parts, the bracket itself and the wall-mount plate. Before disassembly, be sure to note the proper interlocking configuration of the tilt mechanism; this will remove doubts when it is time to reassemble the bracket.

Figure 5. Loosening the tilt lock.



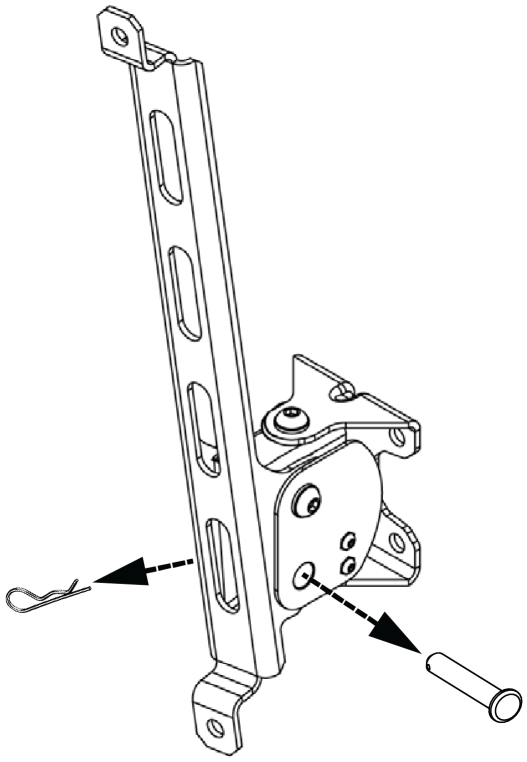
- Make sure that the tilt mechanism can move freely. If it does not, use a 5 mm hex wrench to loosen slightly the horizontal hex-head bolt near the top of the tilt/pan mechanism. The bracket should be free to tilt, but this bolt should remain in place.

Figure 6. Removing the R-clip from the clevis pin.



- Remove the R-clip (hairpin cotter) from the clevis pin that serves as a pivot axle for the tilt mechanism, and remove this clevis pin. Put the pin and the R-clip aside, as they will be required to complete the installation.

Figure 7. Removing the clevis pin from the tilt mechanism.



- Tilt the bracket outwards from the mounting plate until it comes to a stop at its maximum tilt.

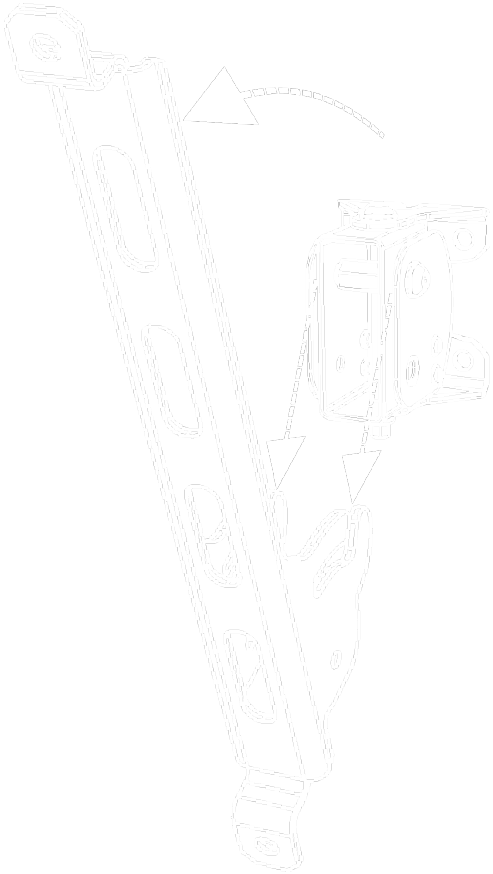
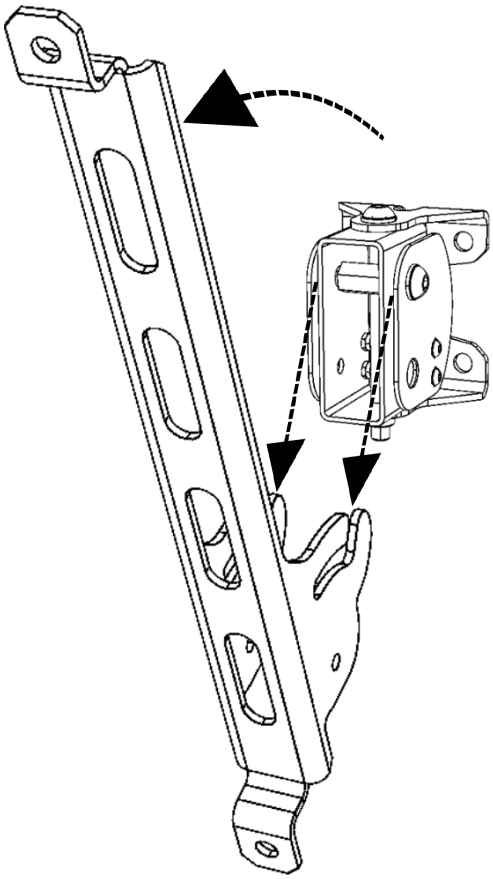


Figure 8. Removing the bracket from the mounting plate.



- The bracket should come away easily towards the bottom of the mount.

Installing the bracket on the LCC44/LCC84 enclosure

Once the bracket has been separated from the wall-mount plate, it can be easily attached to the LCC44 or LCC84 enclosure.

Important: For permanent or semi-permanent installation, the use of medium-strength threadlocking compound is recommended on all user-installed screws.

Figure 9. The rear panels of the LCC44 (left) and LCC84 with the mounting points for the bracket indicated.

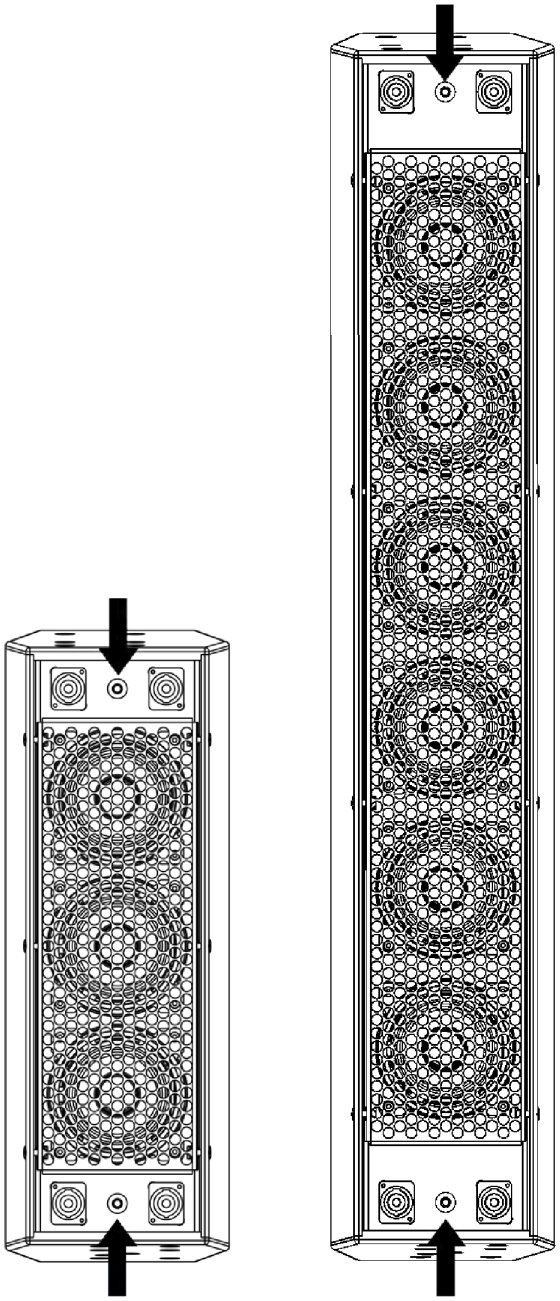
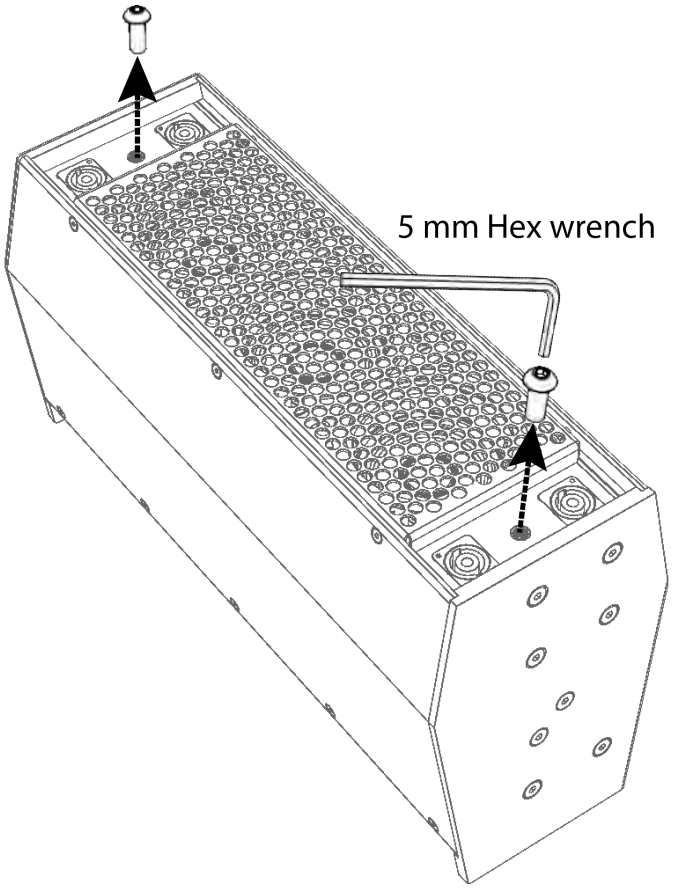
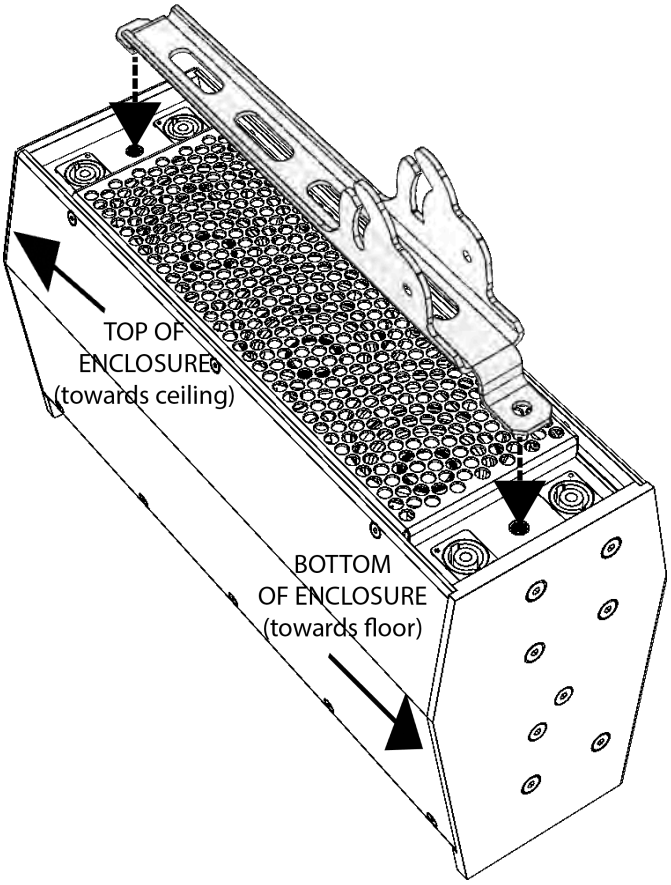


Figure 10. Removing the M8 x 20 mm screws for the installation of the bracket (LCC44 shown).



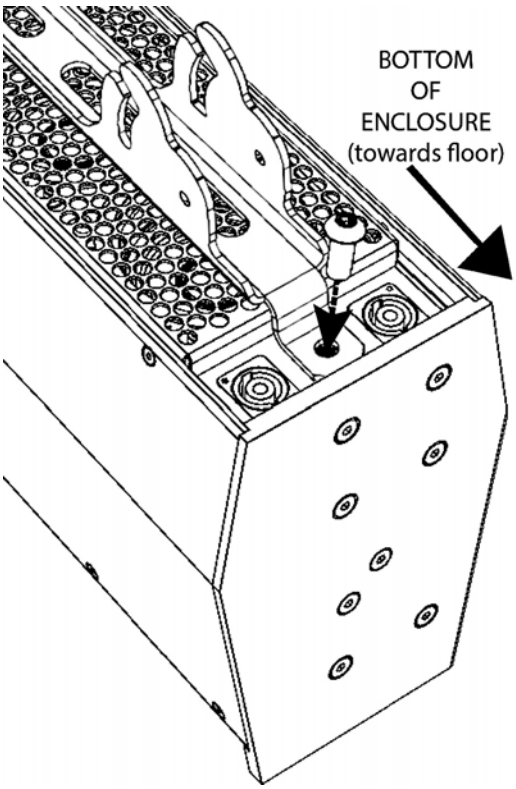
- Lay the enclosure on its front grille, taking whatever necessary precautions to avoid damaging the finish of the cabinet or the grille. Although the LCC44 and LCC84 units have a symmetrical vertical coverage and there is no "top" or "bottom" acoustically, if the front grille is equipped with a logo plate you should note its orientation and for aesthetic reasons, and make sure that the bottom of the logo plate will be towards the bottom of the enclosure when it is installed.
- Using a 5 mm hex wrench, remove the two button-head M8 x 20 mm screws from the two connection panels, between each pair of SpeakOn connectors on the rear of the enclosure. Keep them, as they will be used to mount the bracket.

Figure 11. Positioning the bracket and aligning the mounting holes.



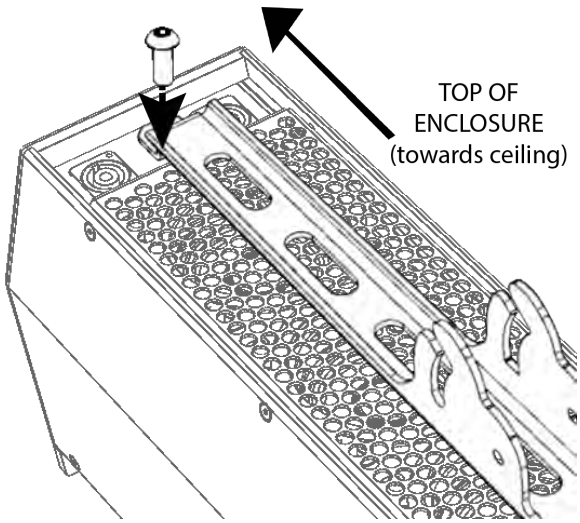
- Place the bracket over the rear of the enclosure, aligning th two mounting holes in the bracket with the threaded holes i the connection panels. Be sure to orient the bracket with th attachment for the wall-mount plate towards the end of th enclosure that will be on the bottom when it is installed.

Figure 12. Inserting the lower screw through the bracket.



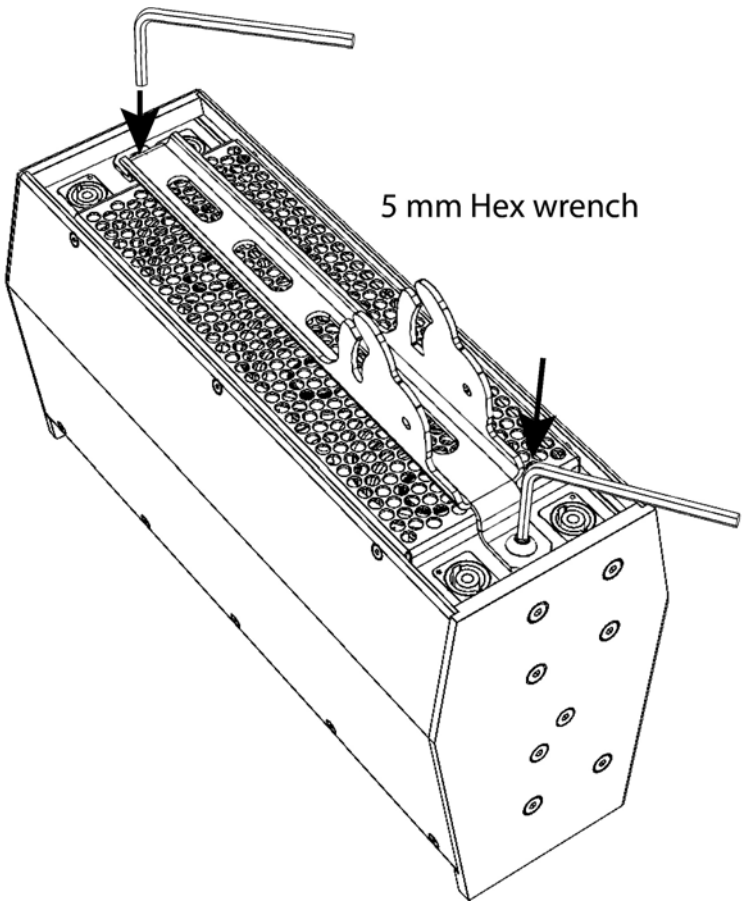
- Insert one of the M8 x 20 mm screws previously removed, and thread it into the bottom (toward floor) panel of the enclosure through the mounting hole in the bracket.

Figure 13. Inserting the upper screw through the bracket.



- The upper end of the bracket can be secured using the second M8 x 20 mm screw previously removed. Insert the screw and thread it into the top (toward ceiling) panel of the enclosure through the upper mounting hole in the bracket.

Figure 14. Tightening the screws to fix the mounting bracket (LCC44 shown).



- Using a 5 mm hex wrench (Allen type) with a length that allows for sufficient leverage, firmly tighten the screws into the panels, making sure that their can be no movement between the bracket and the speaker enclosure.

Installing a redundant safety anchor

Attention: When correctly installed, the Wall Mount Bracket is designed to safely support The LCC44 or LCC84 speaker enclosure under normal conditions. However, connection to an external anchor point using a steel wire rope safety sling or chain is strongly recommended in any installation where people could pass beneath or near the loudspeakers and may be required by local or national codes in installations in public places. If you intend to install a secondary safety sling anchored directly to the enclosure, it is recommended that you use one of the M6 rigging points on the top of the LCC44 or LCC84 enclosure for this purpose.

In most cases of wall mounting a single LCC44 or LCC84 enclosure, the use of a common, steel wire rope sling will provide sufficient redundant safety. Carefully review the third-party manufacturer's documentation to assure that the sling and all its components are certified for the proper Safe Working Load with the required Factor of Safety. The length of the sling and termination on the opposite end will obviously depend on the requirements of the structure to which it will be anchored.

It will be necessary to install an eye bolt in one of the M6 rigging points in the place of the M6 × 16 mm screw supplied with the speaker enclosure. Only a forged steel eye bolt with a collar or shoulder, certified for the proper Safe Working Load with the required Factor of Safety at its minimum load angle can be used.

Important: For permanent or semi-permanent installation, the use of medium-strength threadlocking compound is recommended on all user-installed screws.

Figure 15. M6 Eye bolt measurement requirements.

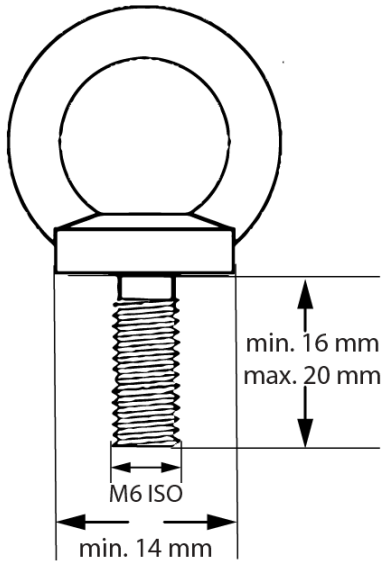
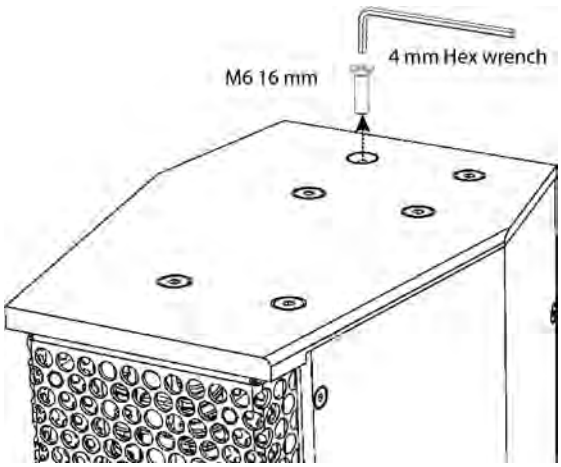
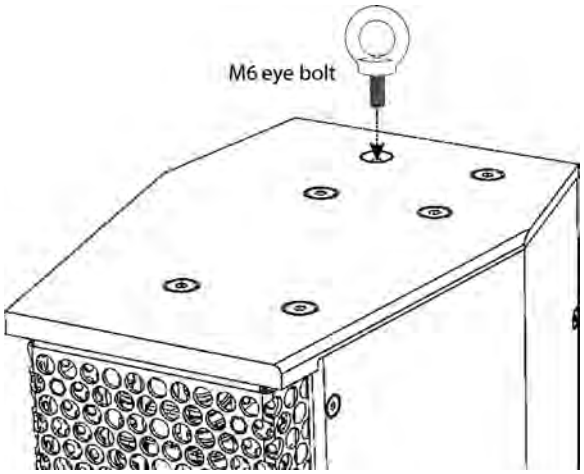


Figure 16. Removing the M6×16 mm countersunk screw for the installation of a safety anchor.



- Using a 4 mm hex wrench, remove one of the M6×16 mm countersunk screws from the top pf the LCC44 or LCC84 enclosure. Though any one of these rigging points is capable of supporting the enclosure, it is good practice to use one of the rigging points nearer the horizontal center of the enclosure and nearest one in a straight line to the external anchor point.

Figure 17. Inserting an M6 eye bolt in the rigging point on the top of the LCC44/84 enclosure.



- Thread the M6 eye bolt into the rigging point from which the screw was removed and tighten it with your fingers.

Figure 18. Tightening the eye bolt.

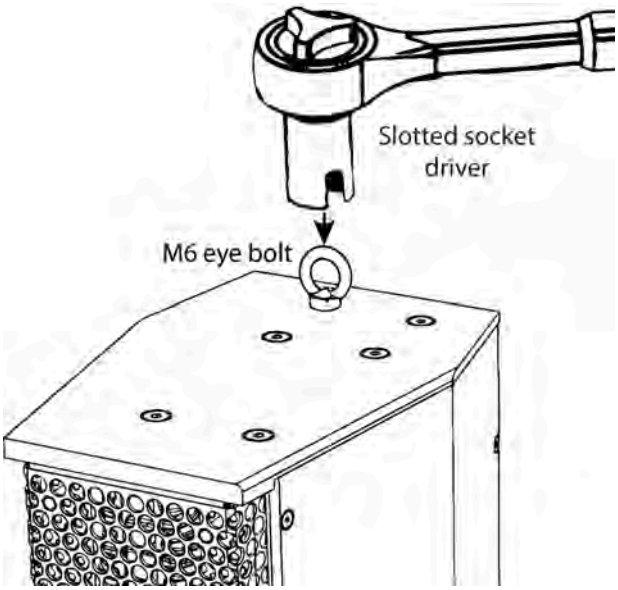
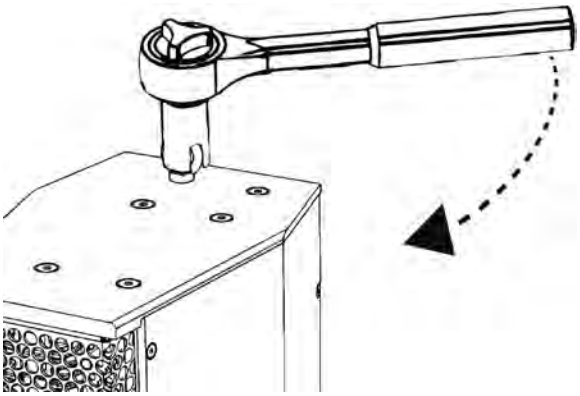


Figure 19. Tightening the eye bolt.



- Using a slotted socket or eye bolt spanner, firmly tighten the eye bolt.

Mounting the bracket

The mounting plate of the LCC44/84 Wall Bracket must be firmly fitted to the wall or surface before mounting and pointing the speaker enclosure.

⚠ WARNING

Before beginning this installation, it is necessary to ascertain the construction type, load-bearing capability and durability of the wall or surface. Bear in mind that the LCC44 speaker enclosure weighs 10 kg (22 lb) and LCC84 weighs 19.5 kg (43 lb). The Wall Mount Bracket is also capable of downward tilt that extends the mass of the enclosure up to a 40° angle out from the mounting surface. Therefore, the increased forces imposed on the fixings and wall must be taken into account.
Careful thought must be given to ensure that the wall structure is strong enough to safely support the total load with the proper Factor of Safety required by local, state and national norms or legislation. If the facility or venue is open to the public and the mount is within reach of the public, the installer should take into consideration possible miscreant behavior or tampering when determining the appropriate factor of safety. If the wall structure is deemed incapable of supporting the load, consideration should be given to strengthening and/or stabilizing the wall or adopting an alternative method of installation. In the case of any doubt, architects, structural engineers or other specialists should be consulted.

⚠ WARNING

Risk of Electric Shock
Drilling into hidden electrical wiring within walls can result in serious injury or death, fires and property damage.
BE AWARE OF WHAT YOU ARE DRILLING INTO. Before drilling holes in any wall or surface, make sure that it does not conceal electrical wiring or conduits. Consult the wiring diagram of the facility or venue and check for nearby outlets, switches or junction boxes that could indicate concealed wiring, be it electrical mains, network, telephone or other infrastructure.

⚠ CAUTION

Use Proper Eye, Ear, Head, Foot and Hand Protection During Installation
This task may require the use of power tools and potentially elevated loads.
All local and national norms, regulations and guidelines must be followed during the installation procedures, including the use of proper protective clothing and gear.

Notice: Due to the wide variety of building materials and construction methods that can be encountered in an installation, 1 Sound can only provide general recommendations for installing the Wall Mount Bracket. It is the responsibility of the installer to assess the appropriate stability and sturdiness of the installation. This includes verifying the positions of suitable studs, posts or framing in the case of drywall mounts, verifying hollow points in masonry, concrete block or solid concrete, and utilizing anchoring methods and hardware appropriate for safe installation of the equipment according to the construction material and depth of the mounting surface. The responsibility rests with the installer to verify that the installation is carried out in accordance with any applicable legislation. In case of any doubt, architects, structural engineers or other specialists should be consulted.

Notice: In the case of installation in solid concrete, concrete block or masonry structures, due to the size of the mounting plate and the narrow distance between the mounting holes in the plate, the use of expansion anchors (sleeve anchors, wedge anchors, plastic anchors etc.) is not recommended, as the proximity between them is likely inferior to safe spacing practices for this type of fastener, and could potentially weaken the mounting surface. Verify the building material, as well as its depth and condition to determine the appropriate anchoring system. Make sure that the fasteners include washers or have flanged heads with adequate outer diameter (from 14 mm to 16 mm) to firmly hold the mounting plate around the holes. Consult the specifications of the third-party hardware and carefully follow the instructions of the manufacturer to determine the appropriate drilling depth, bit diameter, necessary spacing and any further specific instructions or additional necessary procedures.

Important: In the case of a wall constructed of drywall or other panels on a wooden stud frame, it is extremely important to verify that the desired installation point has sufficient solid backing to support the installed speaker enclosure. DO NOT install the mount on unbacked drywall, plywood or plastered lath. A studfinder can be useful for this, but it is better to know the exact layout of the frame beforehand. The center-to-center width between the mounting holes of the Wall Mount Bracket is 1.89" (48 mm), and therefore wider than standard 2x4 (1.5" x 3.5") or 2x6 (1.5" x 3.5") wooden framing studs. Therefore, it is only possible to mount the plate onto other framing members with doubled or wider widths, such as doubled posts or column studs, corner posts, doubled jamb/king studs, solid lintels, or purpose-built internal framing. Be careful to assure that all four mounting holes will be drilled into the solid wood frame. Joints between single studs and single horizontal noggings or fireblocks could be deceptive and provide a mounting position with only three of the screws in solid wood and the fourth only in drywall – an unsafe condition.

Be sure to verify the depth of drywall (commonly 0.5 inches or 6.35 mm) in front of the load-bearing studs and consider this in selecting the length of the fastener necessary. Consult the specifications of the third-party hardware to verify the necessary depth to guarantee the required safety factor, but remember that it is unwise and potentially hazardous to exceed the depth of the framing member into which the anchor is driven.

Figure 20. The wall-mount plate of the LCC44/84 Wall Bracket

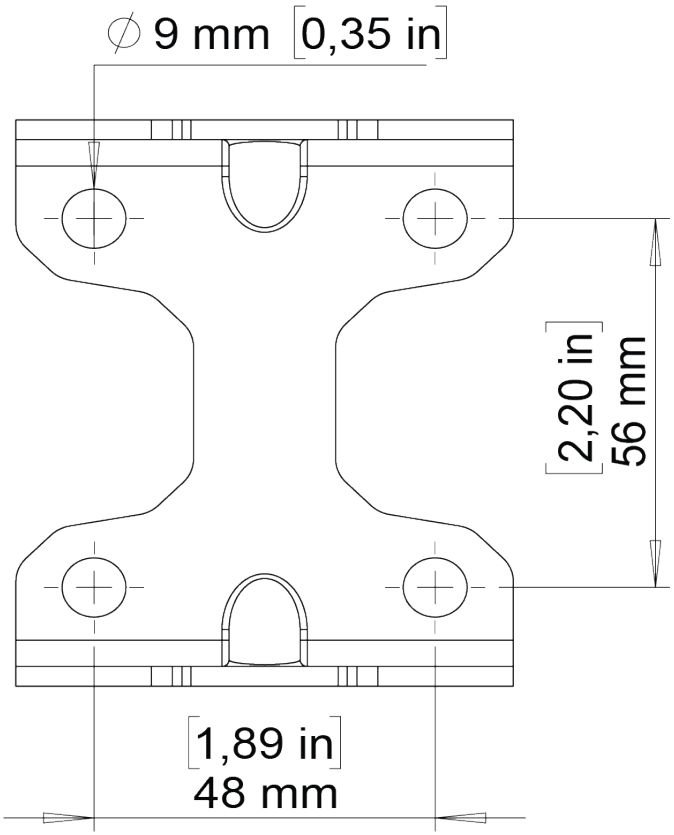
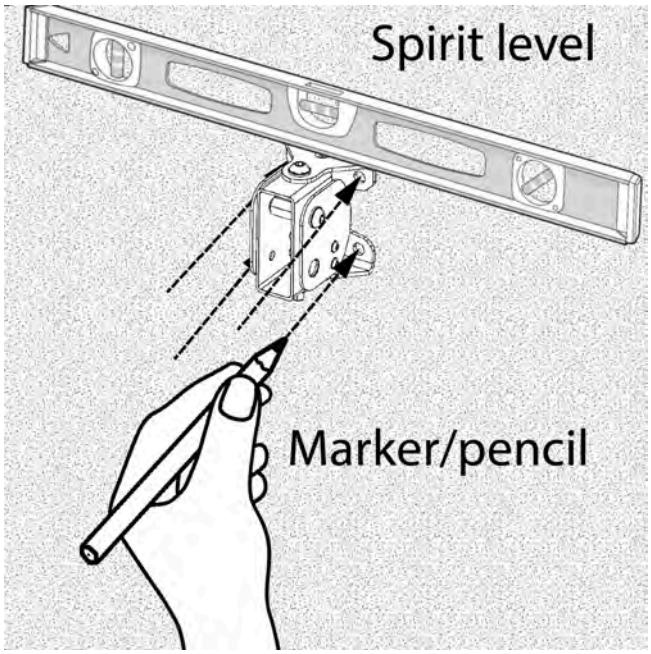
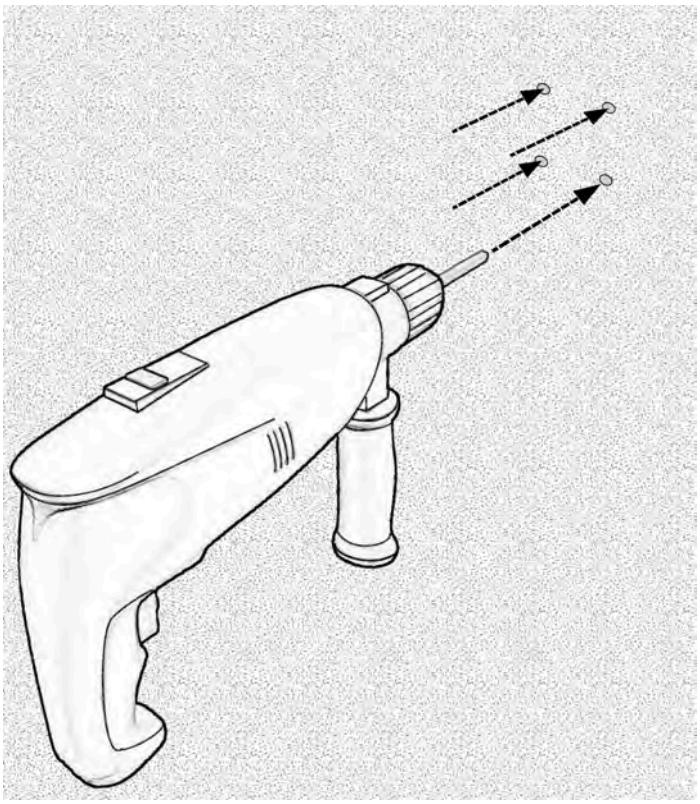


Figure 21. Marking the mounting surface for drilling.



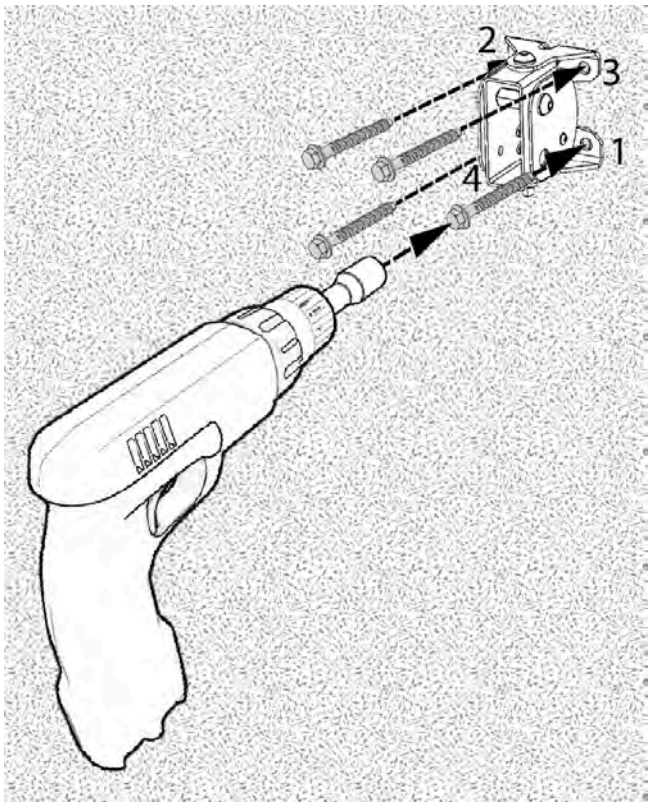
- When it has been verified that there is no wiring or plumbing in the wall behind the mounting position, use the plate itself as a drilling template and mark with the pencil the centers and outlines of the mounting holes. A spirit level can be useful to assure that the mount is properly leveled.

Figure 22. Drilling the mounting holes .



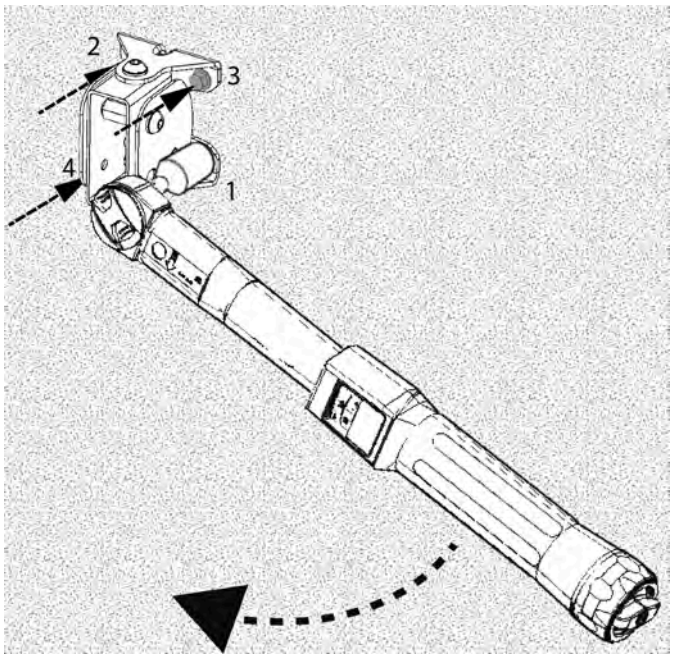
- Drill the four holes, using a drill or percussion drill with a bit approriate to the substrate material (masonry/concrete, wood, steel etc.) with the appropriate diameter and to the appropriate depth for the anchor type being used.
- Once the four mounting holes have been drilled, clear them of residue and verify the appropriate depth of each.
- Place the mounting plate against the wall in the correct orientation (with the hole for the removed clevis pin on the bottom) and align the four mounting holes centered on the drilled holes.
- Insert the four screws or anchors directly through the mounting holes in the plate, tightening the screw anchors with your fingers only sufficiently to keep them in place.

Figure 23. Driving the screw anchors into the wall.



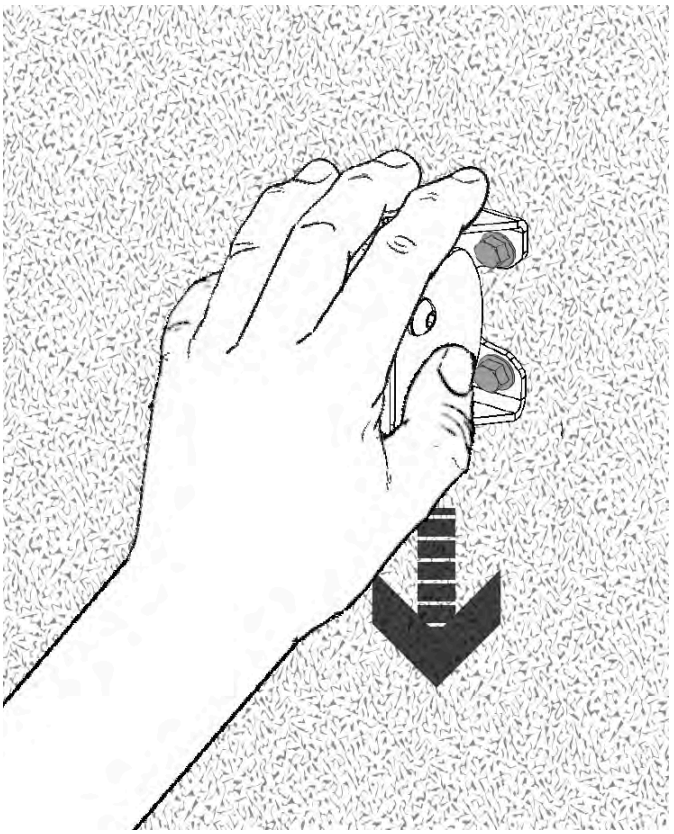
- While holding the plate in place, use a socket wrench or a power screwdriver to tighten each fastener gradually, alternating diagonally opposed fasteners in an "X" pattern until each holds the plate to the wall. When using a power driver, keep it at a low speed to avoid stripping the threading cut into the substrate material. Once the washer or flanged head on each bolt is in contact with the plate and the plate is against the wall, continue tightening them only by hand.

Figure 24. Tightening the screw anchors with a torque wrench.



- Using a torque wrench, tighten each screw anchor into the wall. Take care not to exceed the maximum installation torque specified by the manufacturer of the hardware.

Figure 25. Applying downward force to verify the mount.



- Apply force or weight to the mounting plate to physically verify its ability to support the necessary load. There must be no movement possible between the plate and the wall.

Coupling the LCC enclosure and bracket to the mounting plate

Once the mounting bracket has been installed on the LCC84 or LCC44 and the mounting plate has been secured to the mounting surface, the speaker enclosure can be mounted on the wall.

Figure 26. Installing the LCC44 with the bracket onto the mounting plate.

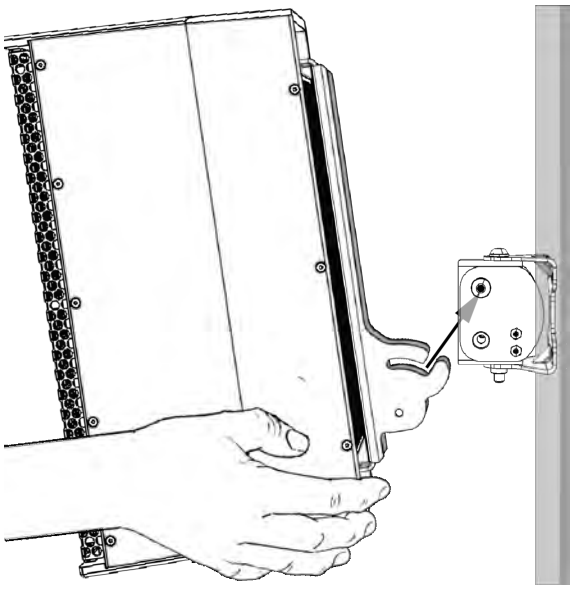
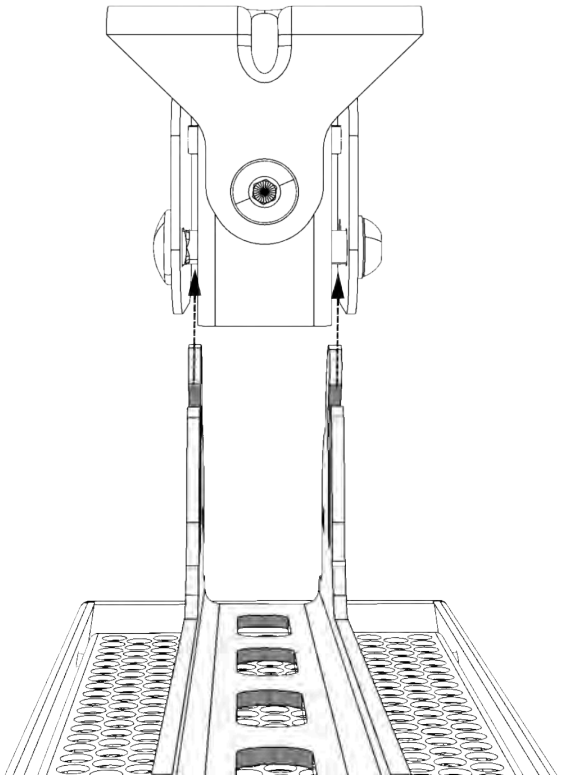
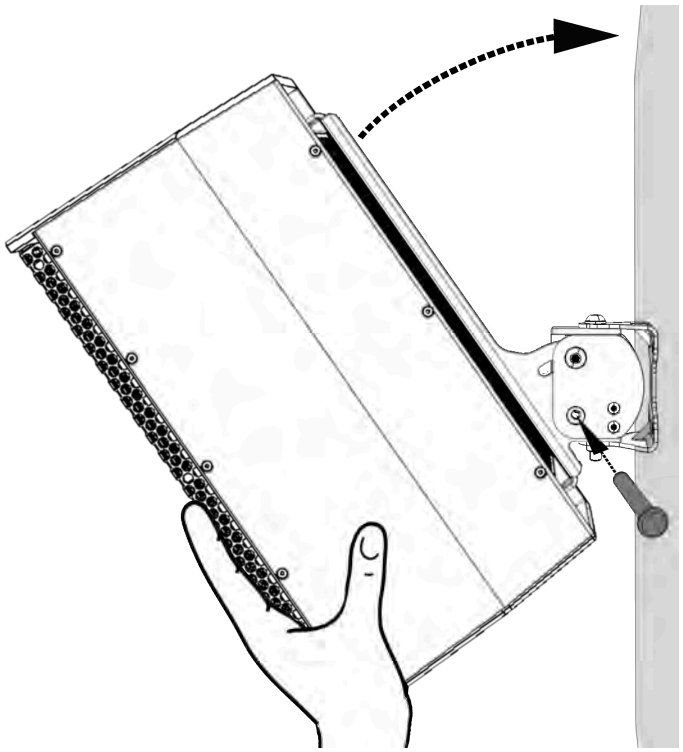


Figure 27. Installing the LCC44 with the bracket onto the mounting plate, overhead view.



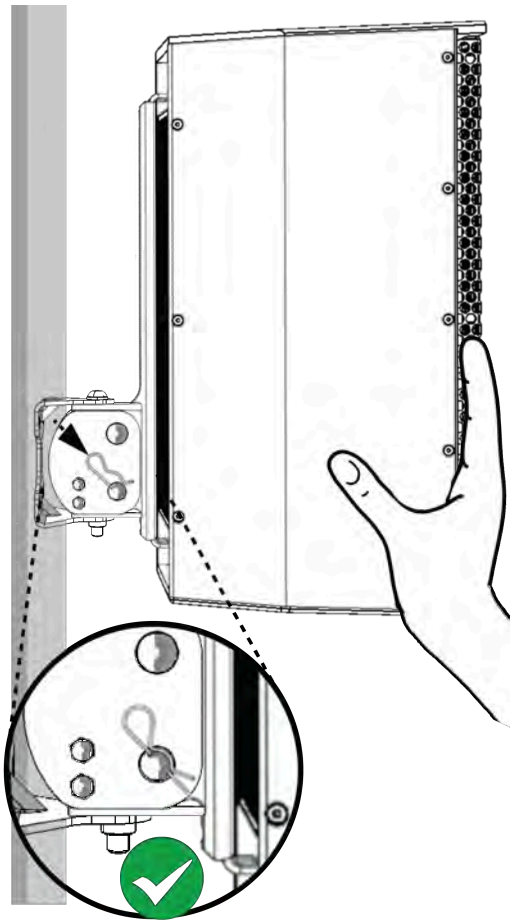
- Lift the LCC44/84 enclosure with the bracket installed up to the mounting plate on the wall. Carefully insert the tilt arms that extend from the rear of the bracket in between the outer and inner plates of the pan/tilt mechanism, and around the bolt that locks the tilt.

Figure 28. Inserting the clevis pin.



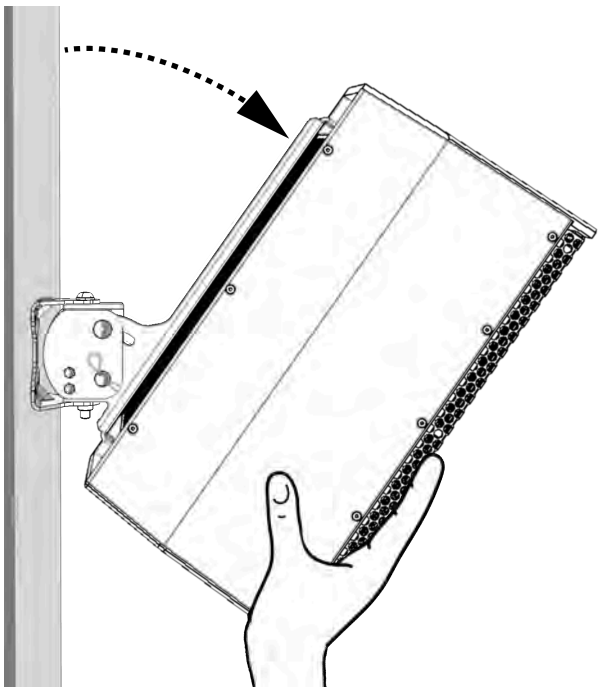
- While maintaining a firm grip on the speaker enclosure, tilt it up towards the mounting surface and align the holes in the bracket with the holes in the lateral plates of the pan/tilt mechanism (below the bolt that locks the tilt) and insert the clevis pin completely through these holes until it protrudes from the other side of the mount.

Figure 29. Replacing the R-Clip.



- Replace the R-clip (hairpin cotter) completely through the hole in the clevis pin until it snaps into place.

Figure 30. Lowering the Speaker enclosure to its maximum tilt.



- At this point, the speaker enclosure is secured to the mount. Slowly lower the speaker enclosure until it stops at 40°. You can now safely release the speaker enclosure and proceed with securing the redundant safety cable and fixing the tilt and pan angles.

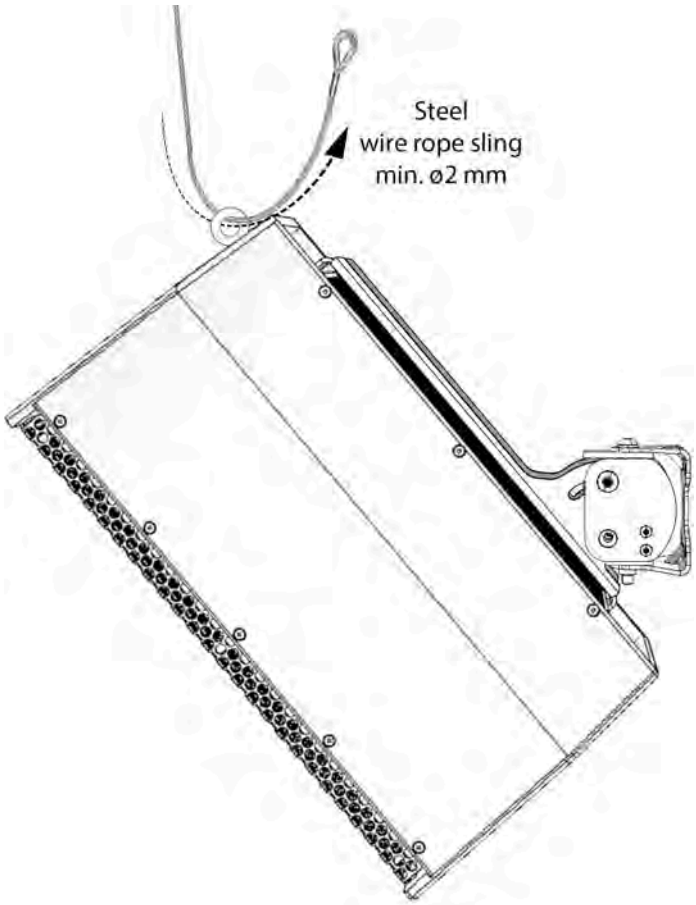
Redundant safety

If the LCC44 or LCC84 speaker enclosure has been equipped with an eye bolt for a redundant safety cable (steel wire rope sling or steel chain), this should be attached to the external anchor before proceeding with the pan/tilt positioning of the enclosure on the Wall Mount Bracket.

ATTENTION

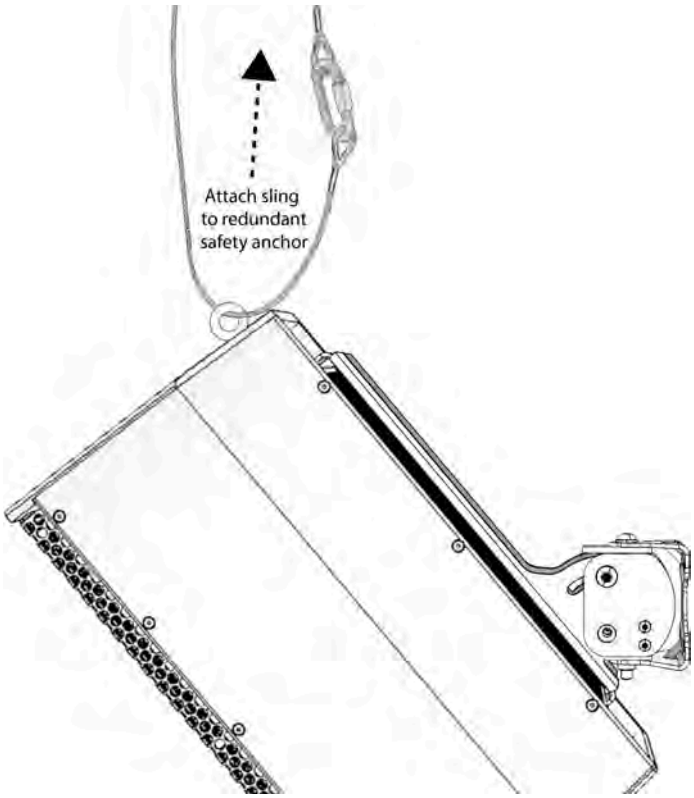
A redundant safety sling must be anchored to a point higher than the enclosure and, if possible, to a separate structural member than the Wall Mount Bracket. If the secondary safety sling must be anchored using a fastener to the same structural member as the Bracket, its anchor must be installed at least one speaker-length away from the anchors holding the Bracket. Use only steel wire ropes or steel chains that conform to applicable regulations or norms in terms of construction and Safe Working Load rating. These must be of proper length and installed in such a position as to prevent the enclosure from falling more than 20 cm in the case of failure of the Bracket or the structure to which it is installed.

Figure 31. Passing a wire rope safety sling through the eye bolt.



- If using an installed eye bolt, pass one end of the sling through the eye bolt mounted on the rear of the enclosure.

Figure 32. Securing the redundant safety sling.



- Pass the opposite end of the sling through an external anchor point or around a structural member and assure that it is properly secured.

Fixing the tilt angle

Once the clevis pin that acts as the pivot axle for the tilt mechanism has been inserted and secured with the R-clip, you can set the required pan and tilt angles. It is advisable to set the tilt angle first, as certain pan angles could obstruct access to the tilt lock bolt. In fact, to allow ample space for tightening the tilt lock, it is convenient to rotate the entire mount as far as the mounting surface will allow in pan to the left (as seen from the front) before setting the tilt angle.

Figure 33. The pan lock bolt, from above.

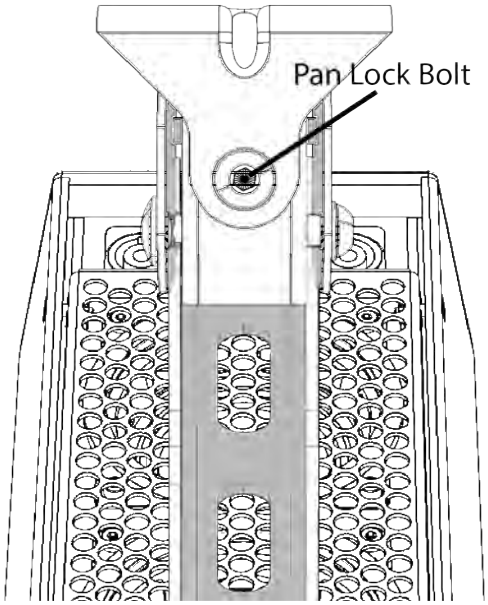
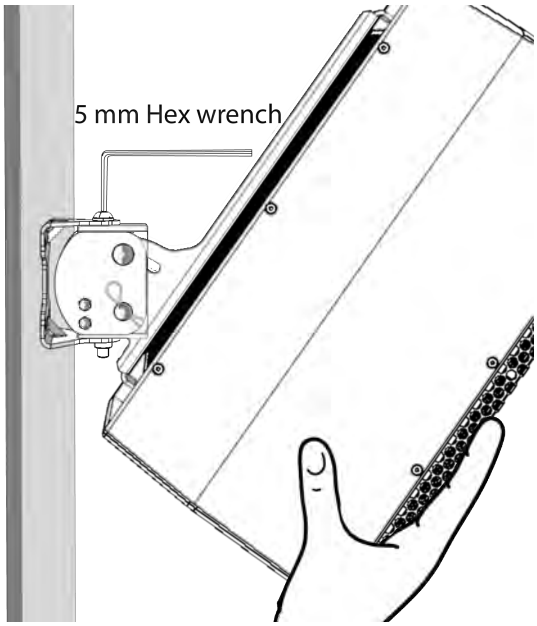
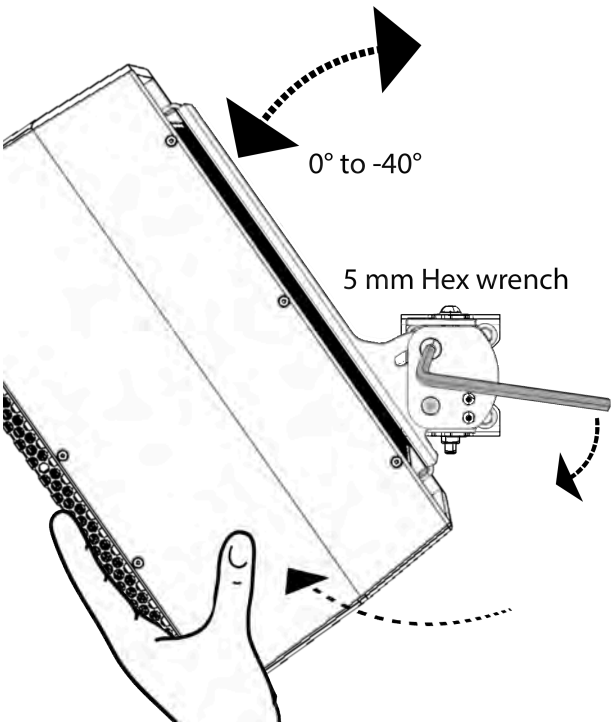


Figure 34. Releasing the pan lock bolt.



- Use a 5 mm Hex wrench to loosen the pan lock bolt on the top of the Wall Mount Bracket.
- Rotate the enclosure to the left to allow clear access to the tilt lock bolt.

Figure 35. Locking the tilt angle.



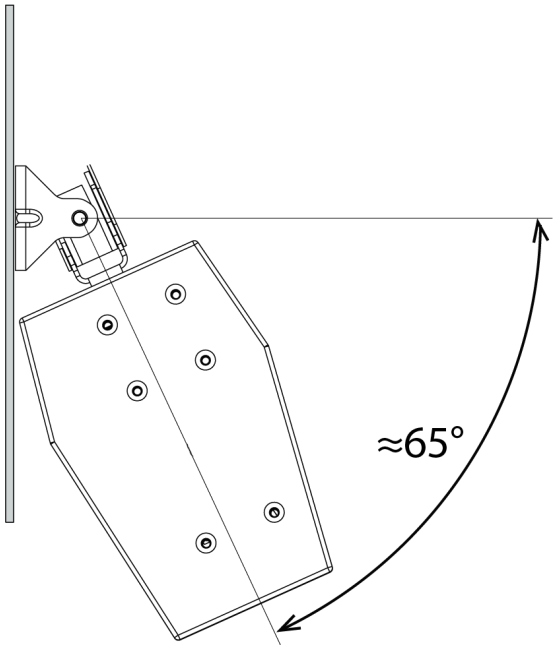
- Adjust the tilt of the enclosure to the required angle and keep a firm hold on it.
- Firmly tighten the tilt lock bolt using a 5 mm Hex wrench.
- Release the speaker enclosure and assure that the chosen angle remains firm.

Fixing the pan angle

With the tilt angle locked, setting the pan angle is as simple as turning the LCC44 or LCC84 enclosure to the desired angle and locking it in place by tightening the pan lock bolt.

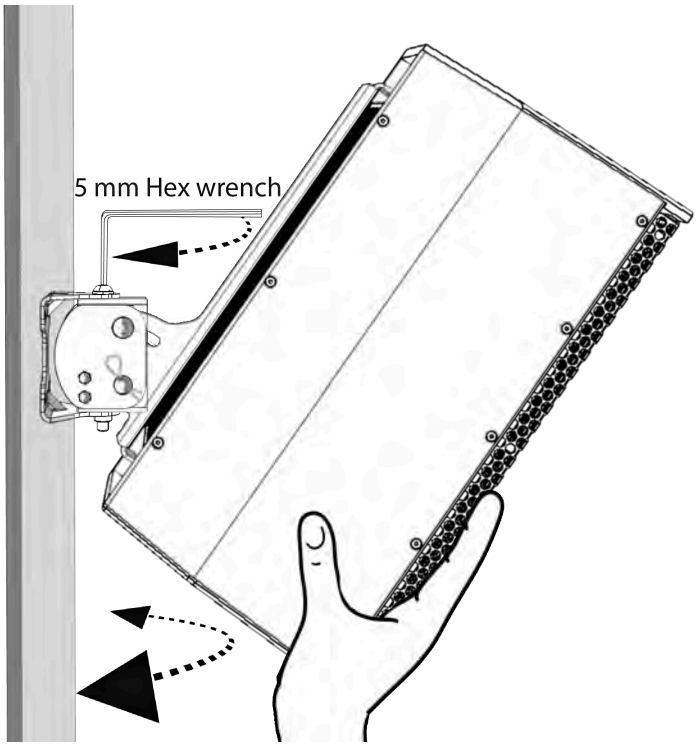
Note: The panning range of the Wall Mount Bracket is ±90° from the center. However, this range may be limited on one or both sides by the mounting surface, due to the width of the rear panel of the LCC44 or LCC84 enclosure. If the Bracket is installed on a flat wall, the mount will allow approximately ±65° of panning range, depending on the tilt angle.

Figure 36. Panning range limit on a continuous wall, view from above.



- Rotate the enclosure to the desired horizontal orientation.

Figure 37. Tightening the bolt to lock the pan angle.



- Using a 5 mm hex wrench, firmly tighten the pan lock bolt until the enclosure is locked in the desired position.

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