



BOSE MSA12X Panaray Modular Steerable Array Loudspeaker Installation Guide

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BOSE MSA12X Panaray Modular Steerable Array Loudspeaker



Product Information

The Modular Steerable Array Loudspeaker is a professional installation product designed for fixed-installation systems. It provides high-quality audio output and features a steerable array design for precise sound directionality. The product has important safety features and complies with various international standards.

Important 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. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an

electrician for replacement of the obsolete outlet.

10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. Only use attachments/accessories specified by the manufacturer.
12. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus.
13. Unplug this apparatus during lightning storms or when unused for long periods of time.
14. Refer all servicing to qualified personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

- This symbol on the product means there is uninsulated, dangerous voltage within the product enclosure that may present a risk of electrical shock.



- This symbol on the product means there are important operating and maintenance instructions in this guide.



- Contains small parts which may be a choking hazard. Not suitable for children under age 3.



- This product contains magnetic material. Consult your physician on whether this might affect your implantable medical device.



Names and Contents of Toxic or Hazardous Substances or Elements

Part Name	Toxic or Hazardous Substances and Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent (CR(VI))	Polybrominated Biphenyl (PBB)	Polybrominated diphenylether (PBDE)
PCBs	X	0	0	0	0	0
Metal parts	X	0	0	0	0	0
Plastic parts	0	0	0	0	0	0
Speakers	X	0	0	0	0	0
Cables	X	0	0	0	0	0
<p>This table is prepared in accordance with the provisions of SJ/T 11364.</p> <p>0: Indicates that said hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement of GB/T 26572.</p> <p>X: Indicates that said hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement of GB/T 26572.</p>						

WARNINGS/CAUTIONS:

- To prevent injury, this apparatus must be securely attached to the wall in accordance with the installation instructions.
- All Bose products must be installed in accordance with local, state, federal and industry regulations. It is the installer's responsibility to ensure installation of the loudspeakers and mounting system is performed in accordance with all applicable codes, including local building codes and regulations. Consult the local authority having jurisdiction before installing this product.
- Unsafe mounting or overhead suspension of any heavy load can result in serious injury or death, and property damage. It is the installer's responsibility to evaluate the reliability of any mounting method used for their application. Only professional installers with the knowledge of proper hardware and safe mounting techniques should attempt to install any loudspeaker overhead.
- Do not mount the product in locations where condensation may occur.
- This product is not intended for installation or use in indoor water facility areas (including, without limitation, indoor pools, indoor water parks, hot tub rooms, saunas, steam rooms and indoor skating rinks).
- To reduce the risk of fire or electrical shock, do NOT expose this product to rain, liquids or moisture.
- Do NOT expose this product to dripping or splashing, and do not place objects filled with liquids, such as vases, on or near the product.
- Keep the product away from fire and heat sources. Do NOT place naked flame sources, such as lighted candles, on or near the product.
- Do NOT make unauthorized alterations to this product.
- Do NOT use a power inverter with this product.
- Do NOT use in vehicles or boats.
- The speaker wire and interconnect cables included with this system are not approved for in-wall installation. Please check your local building codes for the correct type of wire and cable required for in-wall installation.
- Where the mains plug or an appliance coupler is used as the disconnect device, the disconnect device shall remain readily operable.
- The MSA12X wall mounting kit is only for use with model MSA12X.
- Only use the mounting hardware supplied with this product.
- Do not mount on surfaces that are not sturdy, or that have hazards concealed behind them, such as electrical wiring or plumbing. If you are not sure about installing the bracket, contact a qualified professional installer. Ensure the bracket is installed according to local building codes.
- Bose recommends using a safety cable, even if one is not required.

- Due to ventilation requirements, Bose does not recommend placing the product in a confined space such as in a wall cavity or in an enclosed cabinet.
- Do not place or install the bracket or product near any heat sources, such as fireplaces, radiators, heat registers or other apparatus (including amplifiers) that produce heat.

Product Ratings:

- Input Voltage: 100-240 V ~
- Frequency: 50/60 Hz
- Power: 200 W (600 W total)
- Output Voltage: 100-240 V ~
- Frequency: 50/60 Hz
- Current / Power: 4 A / 400 W

FCC Compliance Notice for US

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their own expense. Changes or modifications not expressly approved by Bose Corporation could void the user's authority to operate this equipment.

This product meets all EN55103-2 immunity requirements for E2 electromagnetic environment.

This product complies with the Canadian ICES-003 Class A specifications.

CAN ICES-3(A)/NMB-3(A)

- This product conforms to all applicable EU directive requirements. The complete declaration of conformity can be found at: www.Bose.com/compliance.



- This symbol means the product must not be discarded as household waste, and should be delivered to an appropriate collection facility for recycling. Proper disposal and recycling helps protect natural resources, human health and the environment. For more information on disposal and recycling of this product, contact your local municipality, disposal service, or the shop where you bought this product.



Product Usage Instructions

1. Ensure that the product is installed by professional installers who have read and understood the user manual and safety instructions.

2. Before installation, make sure to provide an earth connection if required by local regulations.
3. Install the Modular Steerable Array Loudspeaker in a fixed-installation system in a non-tropic climate area with an altitude less than 2000 m.
4. Connect the product to a power source with an input voltage of 100-240 V ~ and a frequency of 50/60 Hz.
5. Ensure that the power output does not exceed 200 W (600 W in 100-240 V ~ total) and the current/power does not exceed 4 A / 400 W.
6. Follow the provided operating and maintenance instructions for optimal performance and safety.
7. If using the product in Japan, consult local regulations and provide an earth connection before connecting the main plug to the mains.
8. Dispose of the product responsibly by delivering it to an appropriate collection facility for recycling. Contact your local municipality or disposal service for more information on disposal and recycling options.

Product Overview

The Bose Professional Panaray® MSA12X is a digital beam-steering loudspeaker that enables improved room aesthetics, with outstanding vocal intelligibility and tonal consistency. The proprietary Articulated Array® transducer configuration allows wide, 160° horizontal coverage throughout the room, and MSA12X's modular design allows building of vertical arrays using one (1) to three (3) units. Dante® digital audio network interface comes standard for connection with other Dante-enabled products over Ethernet-based networks.

Product Features

- Digital beam-steering line array column loudspeaker with onboard DSP and 600 watts (12 x 50 W) of amplification
- Family sound profile with the Panaray MA12EX Loudspeaker
- Twelve (12) x 2.25-inch full-range transducers with 80 Hz – 18 kHz frequency range
- Dante® digital audio network interface and line-level analog input
- Articulated Array® configuration allows wide, 160° horizontal coverage
- Modular design allows building vertical arrays using 1-3 units
- Multiple algorithms for beam steering control – designers can optimize consistency of coverage, tonal balance, and maximum SPL per job
- Supports independent level and EQ control of 2 separate beams per array
- Integrated mounting bracket allows up 90° of horizontal yaw adjustment
- Advanced steering and acoustic coverage prediction using Bose Modeler® software
- System setup, control and monitoring with Bose ControlSpace® Designer™ software
- Available in black or white finish

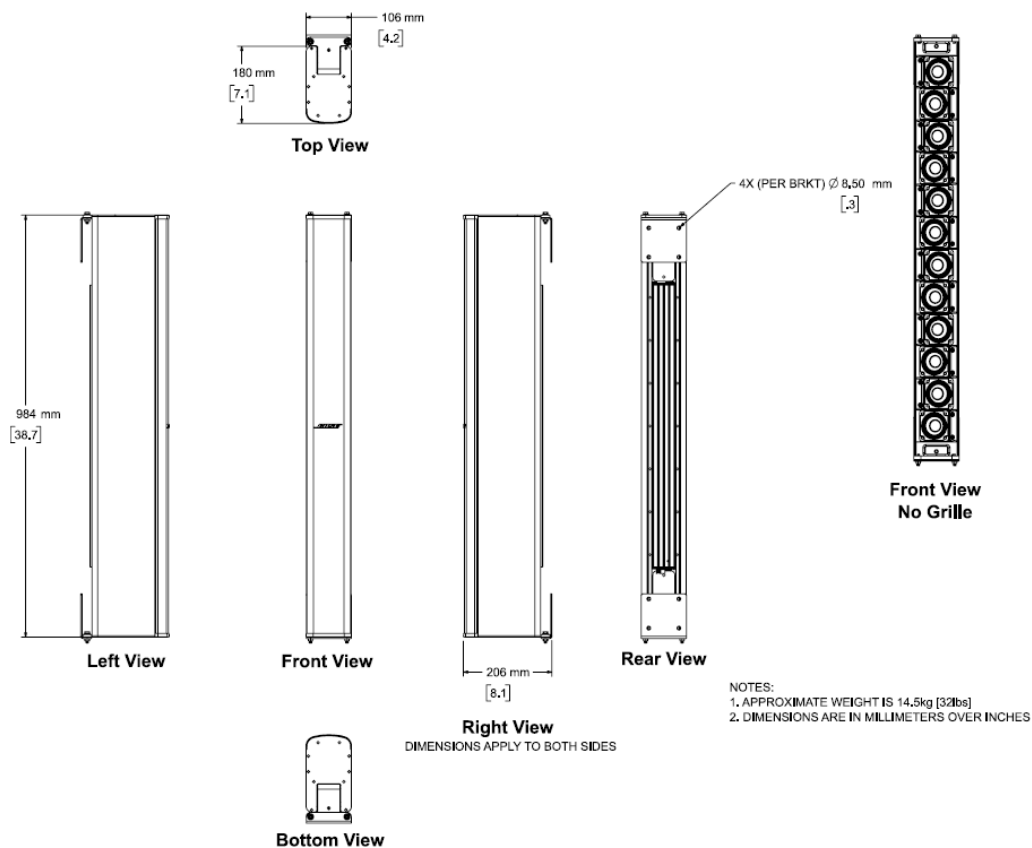
Package Contents

The MSA12X loudspeaker package contains the following:

- One (1) MSA12X loudspeaker module
- Two (2) wall/loudspeaker bracket sets
- One (1) interconnect bracket
- One (1) yaw bracket

- Three (3) power interconnect cables (region-specific) One (1) power cable
- One (1) LVDS audio/control expansion cable (RJ-50)
- One (1) 3-pin Euroblock connector
- Eight (8) M6 flanged head bolts
- Four (4) flat washers
- Four (4) double-sided washer tape rings
- Four (4) M6 flanged nuts
- Twelve (12) zip ties
- Twelve (12) self-tapping screws
- One (1) Bose logo nameplate

Loudspeaker Dimensions



Installation

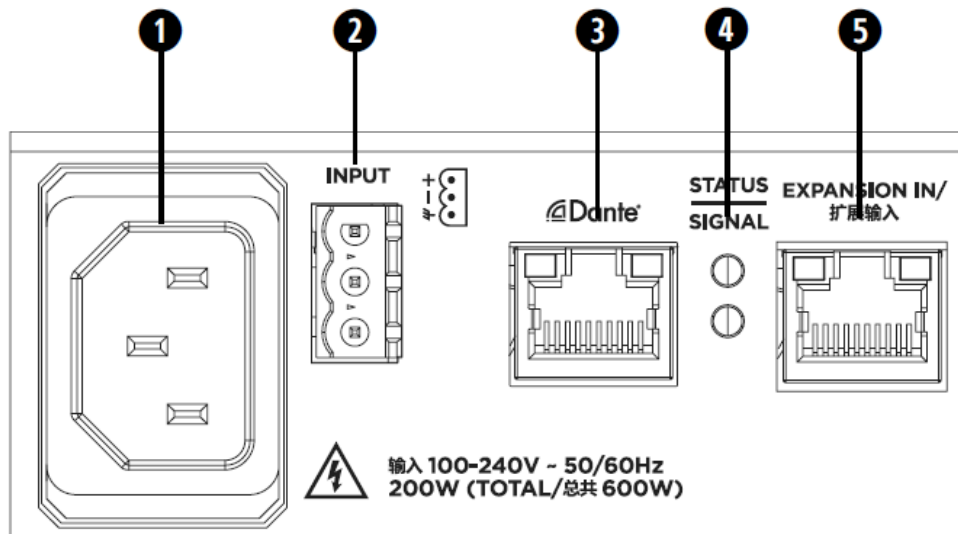
Connector Panels

Input Panel

1. Power connector – Use the included power cable to connect to external power, or use the power interconnect cable to connect multiple loudspeaker units. Use the power interconnect cable that is appropriate for your region.
2. Analog audio connection – Connect to analog audio source using the included 3-pin Euroblock connector.
3. Dante Input – Supports two channels of Dante® digital audio input (RJ-45).
4. Network connectivity indicator lights:

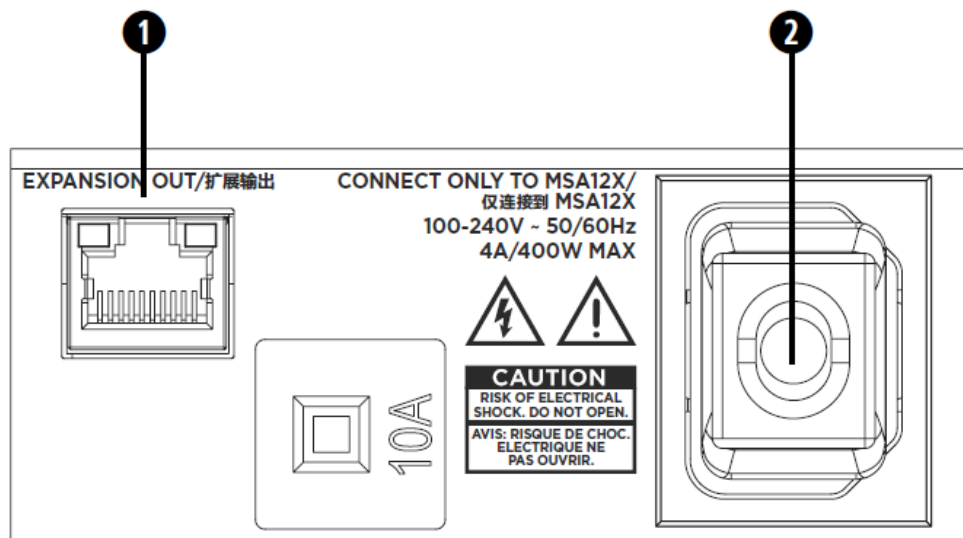
LED	Function	Behavior
LED #1	Status/Fault LED	Solid green: Power on, system OK Solid or blinking red: System fault Blinking green: Identify module, firmware update
LED #2	Analog audio signal present	Green: Signal present Yellow: Limiting Red: Clipping

5. Expansion connection – LVDS audio and control expansion connection (RJ-50). Use when connecting multiple MSA12X loudspeaker modules.



Output Panel

1. Expansion connection – Audio and control connection (RJ-50). Use when connecting multiple MSA12X loudspeaker modules.
2. Power connector – Use the included power interconnect cable to connect multiple MSA12X loudspeaker modules. Use the power interconnect cable that is appropriate for your region.



NOTE: The MSA12X is commonly installed with the Input Panel located at the bottom of the unit, and the Output Panel located at the top of the unit. However, the unit can be rotated 180 degrees for installation, which reverses the positions of the input and output panels. See page 20 for additional instructions when installing the unit in this

position.

Mounting Loudspeaker

The Bose MSA12X loudspeaker can be used as a single loudspeaker module, or you can use the interconnect brackets to create a larger array of up to three modules.

Single Installer Method (Recommended)

The MSA12X is designed to be installed by a single installer, by attaching modules to the mounted wall bracket one at a time, from the top down. The top bracket alone can support the weight of three (3) MSA12X modules. After all of the modules are hanging, you can level and mark the placement of bottom bracket and complete the installation.

Multiple Installer Method

The MSA12X can also be installed by multiple installers, by building the array on the ground and attaching the entire assembly to the mounted wall bracket. This method requires a team of installers who can lift the assembled array into position and correctly position it onto the wall bracket.

Before You Begin – Recommended Tools

- 10 mm sockets and socket wrenches
- Torque wrench

CAUTION:

- The loudspeaker weighs 14.5 kg (32 lbs). Use caution when lifting to avoid injury and/or damage to the speaker.
- Do not place loudspeaker resting on its grille.
- When installing the MSA12X in an alcove, leave a minimum of 0.3 m (1 ft) clearance on the top and bottom of the array.

NOTE:

The MSA12X includes three power interconnect cables, for use when building 2- or 3-module arrays. To comply with local regulatory standards, use the cable that is appropriate for your region. Refer to the labels on each cable to determine which cable is appropriate for your region.

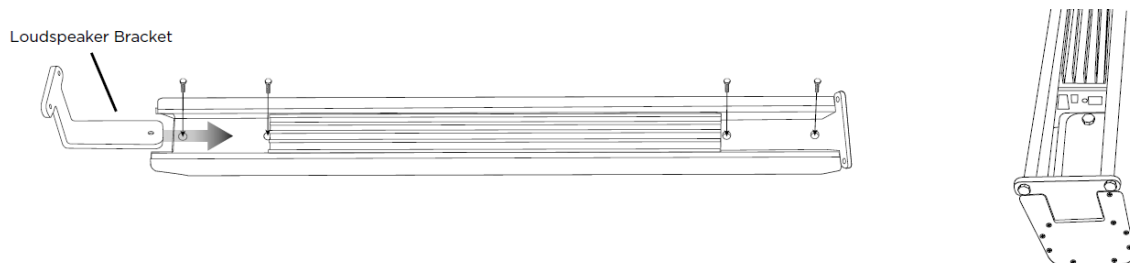
Install Loudspeaker: Single Installer Method

1. Choose a mounting location that will safely support the weight of the loudspeaker. Ensure the mounting surface and the method of attaching the loudspeaker system to the surface is capable of supporting the total weight of the system. Bose recommends a safety factor of 10:1.
2. Remove packing materials and place the loudspeaker on the floor beneath the planned suspension point.
3. Attach the loudspeaker brackets and interconnect brackets (if required) to each module:

NOTE: The MSA12X is commonly installed with the input panel located at the bottom. However, it can also be installed with the input panel located at the top. For more information, see *Installing Loudspeaker in Rotated Position* on page 20.

For a one-loudspeaker assembly:

Attach one loudspeaker bracket to each end of the loudspeaker, using the included flanged head bolts. Tighten bolts to 6.78 N-m (5 ft-lbs).



For a two-loudspeaker assembly:

- Attach one loudspeaker bracket to the bottom loudspeaker module, and one loudspeaker bracket to the top loudspeaker module, using the included flanged head bolts. Tighten bolts to 6.78 N-m (5 ft-lbs).
- Attach one interconnect bracket to the bottom end of the top loudspeaker module, using the included flanged head bolts. Tighten the bolts to finger tightness only.
- Insert a flanged head bolt in the top hole of the top section on the bottom loudspeaker module. Thread the bolt at least four (4) full turns, but not so far that the flange cannot hang through the keyhole of the interconnect bracket.

For a three-loudspeaker assembly:

- Attach one loudspeaker bracket to the bottom loudspeaker module, and one loudspeaker bracket to the top module, using the included flanged head bolts. Tighten bolts to 6.78 N-m (5 ft-lbs).
- Attach one interconnect bracket each to the bottom of the middle and top loudspeaker modules, using the included flanged head bolts.
- Insert a flanged head bolt in the top hole of the top section on the bottom and middle loudspeaker modules. Thread the bolt at least four (4) full turns, but not so far that the flange cannot hang through the keyhole of the interconnect bracket.

4. Install the wall bracket on the wall where the top of the array will be located, using wall mounting screws (not included). Tighten securely. Bracket must be horizontally level. Be sure to leave sufficient clearance from the ceiling for the top of the array.

CAUTION: Choose a position and mounting surface that is capable of supporting the total weight of the system. Bose recommends a safety factor of 10:1.

5. Thread a flanged head bolt into one side of the loudspeaker bracket on the top loudspeaker module.
6. Place a washer between the loudspeaker bracket and the wall bracket. Use the included double-sided tape ring to adhere the washer to the loudspeaker bracket around the protruding threads of the flanged head bolt.
7. Lift the top module up to the wall bracket. Insert the screw into the hole at the top of the loudspeaker bracket. Thread on a flanged nut and hand-tighten securely but loosely, with the speaker turned 90 degrees.

NOTE: For single module installation, skip to Step 9.

8. To connect additional loudspeaker modules:
 - Using the top flanged head bolt already threaded into the top insert of the second module, hang the second module from the first module. The flanged head bolt will fit through the keyhole and hang.
 - Push the second module up to remove the gap between the modules. Thread a flanged head bolt into the second hole, which should now be lined up between the interconnect bracket and the second module.
 - If you are building a three-module array, repeat steps 8a and 8b to attach the third module.

NOTE: For two- and three-loudspeaker assemblies, ensure that all the bolts in the unit are tightened to 6.78 N-m (5 ft-lbs), starting with the top bolt. If two loudspeaker units do not sit flush against each other, slightly loosen the four (4) bolts on the interconnect bracket connecting those two units, realign the units, and retighten the screws from the top down.

9. Attach a wall bracket to the loudspeaker bracket on the bottom unit, using the included flanged head bolts.

- Place a washer between the loudspeaker bracket and the wall bracket. Use the included double-sided tape rings to adhere the washer to the loudspeaker bracket, around the protruding threads of the flanged head bolt.
10. Use a level on the loudspeaker array to position the bottom wall bracket on the wall. Mark as needed for wall mounting screws (not included).
 11. Mount the wall bracket to the wall, using hardware appropriate for your application.

CAUTION: Ensure the mounting surface and the method of attaching the loudspeaker system to the surface is capable of supporting the total weight of the system. Bose recommends a safety factor of 10:1.

12. For two- and three-loudspeaker assemblies, connect interconnect power and audio cables between units.
13. Secure cables with the included zip ties and fasten with self-tapping screw into extrusion slot near the interconnect bracket. It is recommended to screw the zip ties close to the power cable connection to ensure that the power cable remains secure.
14. Connect field wiring and test loudspeaker operation. It is recommended to keep the loudspeaker assembly in the 90 degree orientation until loudspeaker operation has been tested, to allow easier access the connection panel and indicator lights.
15. Rotate the loudspeaker assembly into the desired position.
16. If installing the loudspeaker perpendicular to the wall, insert flanged head bolts into both holes on the bottom wall bracket, to secure the loudspeaker bracket to the wall bracket. Place washers between the loudspeaker bracket and the wall bracket.

If installing the loudspeaker at an angle that is not perpendicular to the wall, attach the yaw bracket to the loudspeaker and wall bracket to lock the speaker into position. The yaw bracket secures the loudspeaker array into position, in 6° increments (from 12° to 90°).

- Attach the yaw bracket to the wall bracket, using the included flanged head bolt.
 - Attach the yaw bracket to the loudspeaker bracket, using the included flanged head bolt.
17. Tighten the flanged head bolts and flanged nuts connected to the loudspeaker brackets at the top and bottom of the array, using a torque not to exceed 6.78 N-m (5 ft-lbs).

Install Loudspeaker: Multiple Installer Method

1. Install the wall bracket on the wall where the top of the array will be located, using wall mounting screws (not included). Tighten securely. Bracket must be horizontally level. Be sure to leave sufficient clearance from the ceiling for the top of the array.

CAUTION: Choose a position and mounting surface that is capable of supporting the total weight of the system. Bose recommends a safety factor of 10:1.

2. Assemble complete array on the ground:

- For single module: Attach loudspeaker brackets to each end of the loudspeaker module, using the included flanged head bolts. Tighten bolts to 6.78 N-m (5 ft-lbs).
 - For 2- or 3- module array: Attach one loudspeaker bracket to the bottom loudspeaker module, and one loudspeaker bracket to the top loudspeaker module, using the included flanged head bolts. Attach one interconnect bracket between each pair of loudspeaker modules, using the included flanged head bolts. Tighten all bolts to 6.78 N-m (5 ft-lbs).
3. Thread a flanged head bolt into one side of the loudspeaker bracket on the top loudspeaker module.
 4. Place a washer between the loudspeaker bracket and the wall bracket. Use the included double-sided tape ring to adhere the washer to the loudspeaker bracket around the protruding threads of the flanged head bolt.
 5. Hang complete loudspeaker array (1-3 modules) from top bracket. Ensure that the flanged head bolt attached

to the loudspeaker bracket is fully inserted into the clearance hole of the wall bracket. Thread a flanged nut onto the bolt and hand-tighten securely but loosely, with the speaker turned 90 degrees.

6. Attach a wall bracket to the loudspeaker bracket on the bottom unit, using the included flanged head bolts. Place a washer between the loudspeaker bracket and the wall bracket. Use the included double-sided tape rings to adhere the washer to the loudspeaker bracket, around the protruding threads of the flanged head bolt.
7. Use a level on the loudspeaker array to position the bottom wall bracket on the wall. Mark as needed for wall mounting screws (not included).
8. Mount the wall bracket to the wall, using hardware appropriate for your application.

CAUTION: Ensure the mounting surface and the method of attaching the loudspeaker system to the surface is capable of supporting the total weight of the system. Bose recommends a safety factor of 10:1.

Reattach MSA12X to wall brackets, including bottom screw and flanged nut.

9. For two- and three-loudspeaker assemblies, connect interconnect power and audio cables between units.
10. Secure cables with the included zip ties and fasten with self-tapping screw into extrusion slot near the interconnect bracket. It is recommended to screw the zip ties close to the power cable connection to ensure that the power cable remains secure.
11. Connect field wiring and test loudspeaker operation. It is recommended to keep the loudspeaker assembly in the 90 degree orientation until loudspeaker operation has been tested, to allow easier access the connection panel and indicator lights.
12. Rotate the loudspeaker assembly into the desired position.
13. If installing the loudspeaker perpendicular to the wall, insert flanged head bolts into both holes on the bottom wall bracket, to secure the loudspeaker bracket to the wall bracket. Place washers between the loudspeaker bracket and the wall bracket.

If installing the loudspeaker at an angle that is not perpendicular to the wall, attach the yaw bracket to the loudspeaker and wall bracket to lock the speaker into position. The yaw bracket secures the loudspeaker array into position, in 6° increments (from 12° to 90°).
 - Attach the yaw bracket to the wall bracket, using a flanged head bolt.
 - Attach the yaw bracket to the loudspeaker bracket, using a flanged hex bolt.
14. Tighten the flanged head bolts and flanged nuts connected to the loudspeaker brackets at the top and bottom of the array, using a torque not to exceed 6.78 N-m (5 ft-lbs).

Technical Information

Using a Safety Cable

Some regional construction codes require the use of a secondary method of securing loudspeakers to support structures to provide additional safety. Bose recommends using a safety cable, even if one is not required. Follow the safety cable manufacturer's instructions. Choose a mounting position, method, and hardware consistent with local building codes and regulations.

The MSA12X provides two options for connecting a safety cable:

- Connect a safety cable using the 7mm (0.28 in) hole in the loudspeaker bracket, either directly or using an M6 eye bolt and nut (not included), tightened to 6.78 N-m (5 ft-lbs).
- Connect a safety cable directly to the MSA12X using the 10 mm (0.39 in) hole in the interconnect bracket.

CAUTION: If you are unfamiliar with the proper design, use, and purpose of a safety cable, consult a licensed

professional engineer or a rigging professional.


Installing Loudspeaker in Rotated Position

The MSA12X can be rotated 180 degrees for installation. This reverses the position of the input and output connection panels.

To install a MSA12X unit or 2- or 3-loudspeaker assembly in the reverse position, follow the general instructions for Mounting Loudspeaker beginning on page 16. In addition:

- 1. Remove the Bose logo that comes pre-installed on the loudspeaker and discard. Attach the extra logo included in the package in the new position.
- 2. Specify the reverse speaker orientation using Bose ControlSpace Designer software. Change from bottom to top configuration in the Advanced window. For more information, see the help system located in the ControlSpace Designer software.

Documents / Resources

	<p>BOSE MSA12X Panaray Modular Steerable Array Loudspeaker [pdf] Installation Guide</p> <p>MSA12X Panaray Modular Steerable Array Loudspeaker, MSA12X, Panaray Modular Steerable Array Loudspeaker, Modular Steerable Array Loudspeaker, Steerable Array Loudspeaker, Array Loudspeaker, Loudspeaker</p>
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