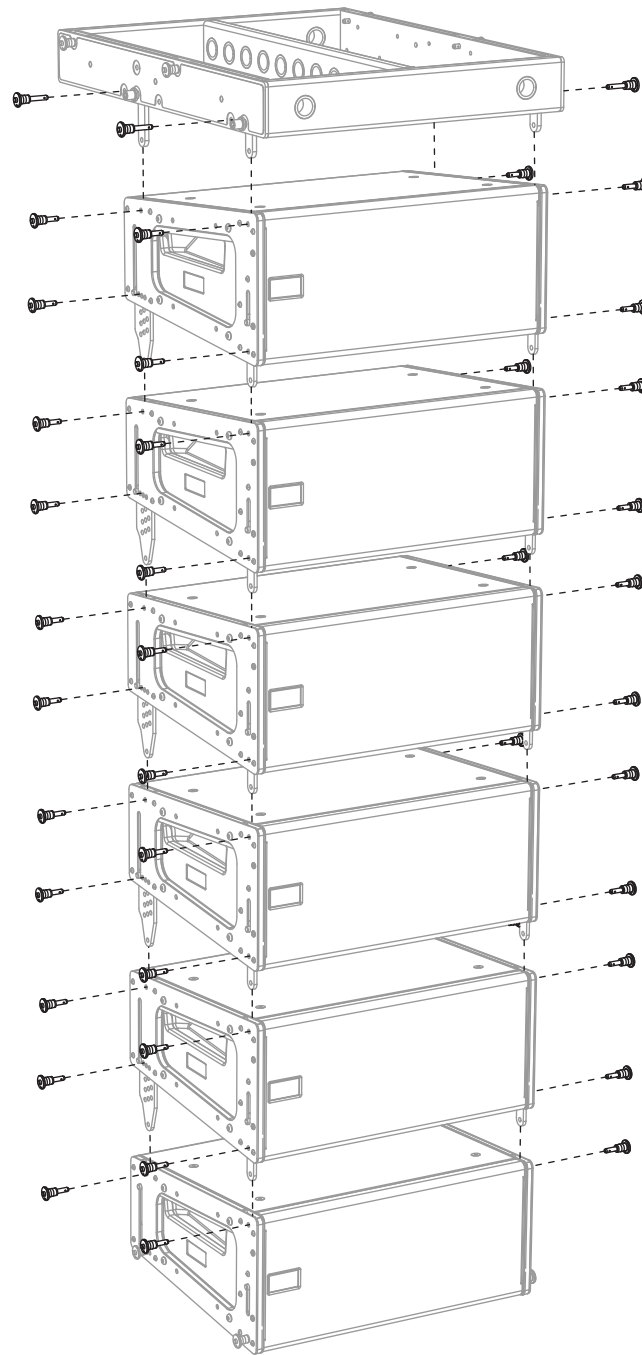


MG-MINA Grid and Accessories



**Keep these important operating instructions.
Check www.meyersound.com for updates.**

EC DECLARATION OF CONFORMITY

within the meaning of the EC Machine Directive 2006/42/EC

Product Identification

Product Name / Cat. Number: MG-MINA Grid / 40.207.101.01
Product Name / Cat. Number: MTF-M'elodie/MINA Transition Frame / 40.207.103.01
Brand: Meyer Sound Laboratories
Batch/Serial Nr: See SERIAL NUMBER LABELED ON ITEM.

Manufacturer

Name: Meyer Sound Laboratories
Address: 2832 San Pablo Avenue
Berkeley, CA 94702-2204, USA
Country: United States of America
Representative: Meyer Sound Laboratories

Authorized Representative/Distributor in Europe

Name: Meyer Sound Lab. GmbH
Horresser Berg 4A, 56410
Montabaur
Country: Germany

Means of Conformity

Meyer Sound Laboratories declares that the product listed is in conformity with the essential requirements and provisions of Council Machine Directive 2006/42/EC SAFETY OF MACHINERY by type testing.

National standards and technical specifications applied, in particular: EN 292, DIN 18800, BGV C1.
Installing per this Assembly Guide.

Signed:



Name: Ms. Margie Garza, Director of Quality
Place and Date: Berkeley, California, USA. May 23, 2011

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MG-MINA Grid and Accessories Assembly Guide, PN 05.207.101.01 A

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CONTENTS

Chapter 1: Introduction	5
How to Use This Manual	5
Safety, Regulatory, Inspection & Maintenance Information	5
Chapter 2: MINA GuideALinks	9
MINA GuideALinks	9
Chapter 3: MG-MINA Grid	13
MG-MINA Grid Load Ratings	15
Chapter 4: Flying MINA Arrays with the MG-MINA Grid	17
MG-MINA Grid Orientations for Flown Configurations	17
MG-MINA Pickup Configurations	19
MAPP Online Pro and Rigging	20
Chapter 5: Groundstacking MINA Arrays with the MG-MINA Grid	23
Angles for Groundstacked MINAs with the MG-MINA	24
Chapter 6: MTF-M'elodie/MINA Transition Frame	27
M'elodie Array with Flown MINAs	29
500-HP Subwoofers with Flown MINAs	34
Groundstacked 500-HP Subwoofers with MINAs	39
Chapter 7: MYA-MINA Mounting Yoke	43
MYA-MINA Load Ratings	46
MYA-MINA Bracket Options	47
MYA-MINA Flown Configurations	48
MYA-MINA Pole-Mount Configurations	50
Chapter 8: MUB-MINA U-Bracket	51
MUB-MINA Load Ratings	53
MUB-MINA Angle Settings	53
MUB-MINA Floor-Mount Configurations	56
MUB-MINA Pole-Mount Configurations	57
MUB-MINA Ceiling-Mount Configurations	58
MUB-MINA Flown Configurations	59
Chapter 9: The MCF-MINA Caster Frame	61
Safety Guidelines for the MCF-MINA Caster Frame	65
Appendix A: Assembling MINA Arrays with the MG-MINA Grid	67

CHAPTER 1: INTRODUCTION

HOW TO USE THIS MANUAL

Make sure to read these operating instructions in their entirety before configuring a loudspeaker system with MINA loudspeakers. In particular, pay close attention to material related to safety issues.

As you read these operating instructions, you will encounter the following icons for notes, tips, and cautions:



NOTE: A note identifies an important or useful piece of information relating to the topic under discussion.



TIP: A tip offers a helpful tip relevant to the topic at hand.



CAUTION: A caution gives notice that an action may have serious consequences and could cause harm to equipment or personnel, and could cause delays or other problems.

Information and specifications are subject to change. Updates and supplementary information are available at www.meyersound.com.

Meyer Sound Technical Support is available at:

- **Tel:** +1 510 486.1166
- **Tel:** +1 510 486.0657 (after hours support)
- **Web:** www.meyersound.com/support
- **Email:** techsupport@meyersound.com

SAFETY, REGULATORY, INSPECTION & MAINTENANCE INFORMATION

Please read this Statement carefully and in its entirety. It contains important information regarding safety issues, including guidelines for general safe use of rigging systems as well as advisories on government regulations and liability laws.

Scope of this Manual

Although this manual contains much useful information on rigging in general, it does not claim to be a comprehensive resource on the subject. This manual assumes that the owners and/or users of a QuickFly® system are knowledgeable and experienced in the areas of rigging and flying loudspeaker systems. **MANY ISSUES OF CRUCIAL CONCERN, SUCH AS THE DETERMINATION OF APPROPRIATENESS AND CONDITION OF VENUE RIGGING POINTS, CANNOT BE ADDRESSED HERE. THEREFORE, THE USER MUST ASSUME ALL RESPONSIBILITY FOR THE APPROPRIATE USE OF QUICKFLY SYSTEMS IN ANY PARTICULAR LOCATION OR CIRCUMSTANCE.**

The suspension of large, heavy objects in public places is subject to numerous laws and regulations at the national/federal, state/provincial, and local levels. This manual does not address the specifics of any such applicable laws and government regulations. This manual details procedures and practices consistent with those generally acknowledged as allowable and safe in the United States. However, the user must assume responsibility for making sure that the use of any QuickFly system and its components in any particular circumstance or venue conforms to all applicable laws and regulations in force at the time.

Load Ratings and Specifications

Long-term safe operation is a central concern in the design and manufacture of any rigging/flying system. Meyer Sound has taken great care in material selection and component design. After manufacture, all load-critical system components are individually inspected.

All load ratings and other specifications given in this manual are the result of accepted engineering practice and careful testing. However, such specifications and ratings are subject to change. USERS SHOULD CHECK THE QUICKFLY SECTION OF THE MEYER SOUND WEBSITE AT

www.meyersound.com

OR CONTACT TECHNICAL SUPPORT AT REGULAR INTERVALS TO CHECK FOR UPDATED OR REVISED INFORMATION.

Regulatory Compliance

The design and safe working load (SWL) ratings of the QuickFly system are intended to be in compliance with all known regulatory statutes currently applicable in the United States. Unless otherwise specified, all working loads are based on either a 5:1 or 7:1 safety factor. However, as noted above, there are wide variations internationally in the regulations and practices applying to suspension of sound systems in public places. Although regulations in the United States are generally among the most stringent, safety codes may be even stricter other localities (such as those highly prone to earthquakes). In addition, applicable safety codes are open to interpretation: Government officials in one location may have a stricter interpretation than another local official, even when operating under the same regulations and in the same legal jurisdiction.

CONSEQUENTLY, USERS OF QUICKFLY RIGGING SYSTEMS SHOULD BE PREPARED TO TAKE ADDITIONAL SAFETY ASSURANCE MEASURES BEYOND THOSE OUTLINED IN THIS MANUAL. IN ALL CASES, IT IS THE RESPONSIBILITY OF THE USER TO MAKE CERTAIN THAT ANY MEYER SOUND LOUDSPEAKER SYSTEM IS SUSPENDED IN ACCORDANCE WITH ALL APPLICABLE NATIONAL /FEDERAL, STATE /PROVINCIAL, AND LOCAL REGULATIONS.

Safety Responsibilities “Above the Hook”

In most touring applications of rigging systems, the touring sound provider is normally responsible for ensuring the safety of the suspension system only below the attachment point. The safety and suitability of the attachment point is generally seen as the responsibility of the venue owner or operator. However, this distinction (“above the hook” versus “below the hook”) can be open to interpretation. Touring system operators should double-check to make certain that attachment points are approved and suitably load rated, and that the points used are those identified as such by the venue owner or operator. AS AN EXTRA PRECAUTION, CAREFUL INSPECTION OF THE ATTACHMENT POINTS IS ADVISED BEFORE FLYING, PARTICULARLY IN OLDER VENUES OR THOSE HOSTING FREQUENT EVENTS USING LARGE SOUND AND LIGHTING SYSTEMS. In any case, Meyer Sound QuickFly systems are intended only for suspension from approved rigging points, each known to have ample SWL margins for the system components suspended below them.

Inspection and Maintenance

Meyer Sound QuickFly systems are an assembly of mechanical devices, and are therefore subject to wear and tear over prolonged use, as well as damage from corrosive agents, extreme impact, or inappropriate use.

BECAUSE OF THE SAFETY ISSUES INVOLVED, USERS MUST ADOPT AND ADHERE TO A SCHEDULE OF REGULAR INSPECTION AND MAINTENANCE. IN TOURING APPLICATIONS, KEY COMPONENTS MUST BE INSPECTED BEFORE EACH USE. Such inspection includes examination of all load-bearing components for any sign of undue wear, twisting, buckling, cracking, rusting, or other corrosion. In regard to rust and corrosion, the main components of a QuickFly system are either protected by an exterior coating or made from stainless steel, which is impervious to rust and resistant to most corrosive fluids. Nevertheless, normal use and shipping vibrations can wear through the protective coatings, and extremely corrosive fluids (such as battery acid) can cause severe damage with prolonged exposure even to protected parts. Particular

attention should be given to screws, bolts, and other fasteners to make certain the fittings are tight and secure. Metal seams and welds should be examined for any sign of separation or deformation. Meyer Sound strongly recommends that written documentation be maintained on each QuickFly system, noting date of inspection, name of inspector, points of system checked, and any anomalies discovered.

Annual Comprehensive Examination and Test Program

In addition to routine checks on the road for touring systems, Meyer Sound also recommends a careful, comprehensive system examination and testing “at home” in the warehouse or other appropriate location at regular intervals. Such at home examinations and tests should occur at least once a year, and should include a careful inspection of each component under ideal lighting conditions, and then a final comprehensive check of the entire system after it has been flown.

If any anomalies or defects are discovered that could possibly affect the safety or integrity of the system, affected parts or subsystems should be replaced in their entirety before that part of the system is flown again.

Replacement Parts

Any component found to be defective, or any safety-related component you even suspect might be defective, should be replaced with the equivalent, approved part. Parts specific to a QuickFly system should be ordered directly from Meyer Sound. No attempt should be made to substitute what appears to be equivalent or “mostly the same” generic replacements. Some parts used in QuickFly systems are identical to those used in other rigging applications. To the best of our knowledge, most of these suppliers are reputable and their products are reliable. However, Meyer Sound has no way of assuring the quality of products made by these various suppliers. Therefore, Meyer Sound is not responsible for problems caused by components that were not supplied by Meyer Sound.

Training

QuickFly systems are relatively straightforward and easy to use. However, they should only be used by persons trained in the use of loudspeaker rigging systems who have mastered key points of assembly, rigging, and flying. Users should read this manual in its entirety before attempting to deploy any QuickFly system. You may make additional copies of this manual as necessary for in-house use; copies may not be made for any other purpose.



CAUTION: All Meyer Sound products must be used in accordance with local, state, federal and industry regulations. It is the owner’s and/or user’s responsibility to evaluate the reliability of any rigging method for their application. Rigging should be carried out only by experienced professionals.



CAUTION: Always use properly rated rigging hardware.



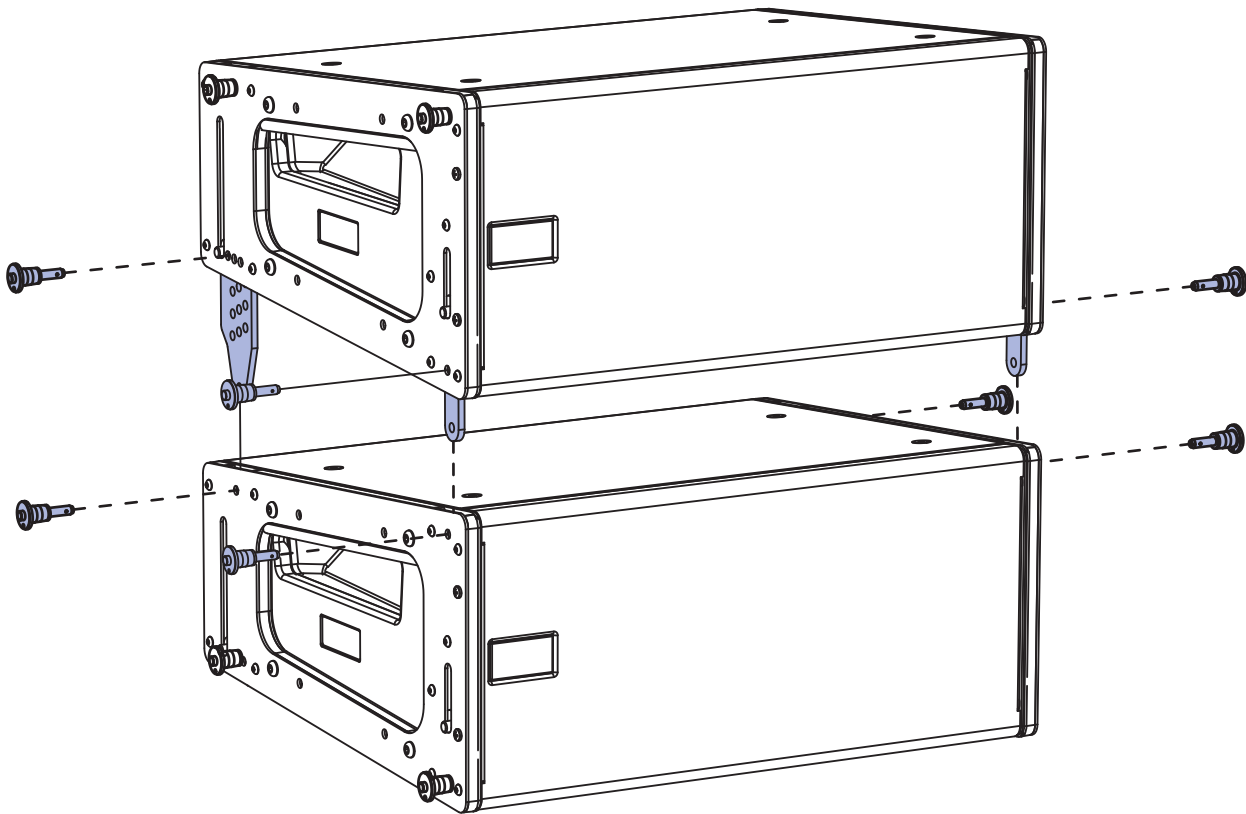
CAUTION: It is important to inspect rigging hardware regularly and replace worn or damaged components immediately.

CHAPTER 2: MINA GUIDEALINKS

MINA loudspeakers are compatible with Meyer Sound's QuickFly® rigging system, a comprehensive collection of rigging, flying, and mounting hardware. MINA's captive GuideALinks allow cabinets to be linked at various splay angles for flying, groundstacking, and transport. The heavy-duty GuideALinks allow for easy adjustment of array tilts, eliminating the need for pull-black straps in flown configurations. M6 attachment points provide connections to the optional MYA-MINA mounting yoke and MUB-MINA U-bracket.

MINA GUIDEALINKS

Each MINA loudspeaker is equipped with four captive GuideALinks that link to adjacent units in flown and groundstacked arrays. Located at the bottom corners of the end plates, the GuideALinks extend and retract with knobs and are secured with quick-release pins.



MINA GuideALinks with Quick-Release Pins

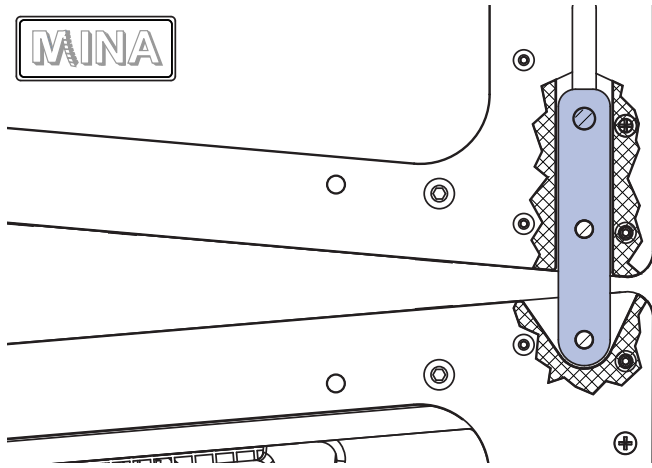
When linking MINAs, two quick-release pins are required for each GuideALink: one to secure the position of the link in the top unit, and one to secure the link to the linked bottom unit. Eight (1/4" x 0.53") quick-release pins are included with each MINA.



CAUTION: Make sure to secure the MINA GuideALinks with the included quick-release pins. GuideALink knobs are for extending and retracting the links and should not be used to support the weight of the loudspeaker when fully extended (without the pins).

Front GuideALinks

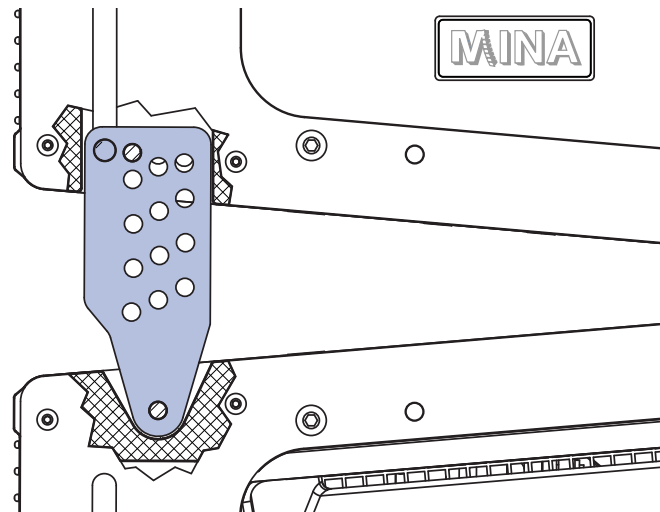
The front GuideALinks act as a pivot point between linked MINAs, with the splay angle between the units determined by the rear GuideALink positions. When stowing front GuideALinks, the knob is positioned at the top of the slot.



MINA Front GuideALinks

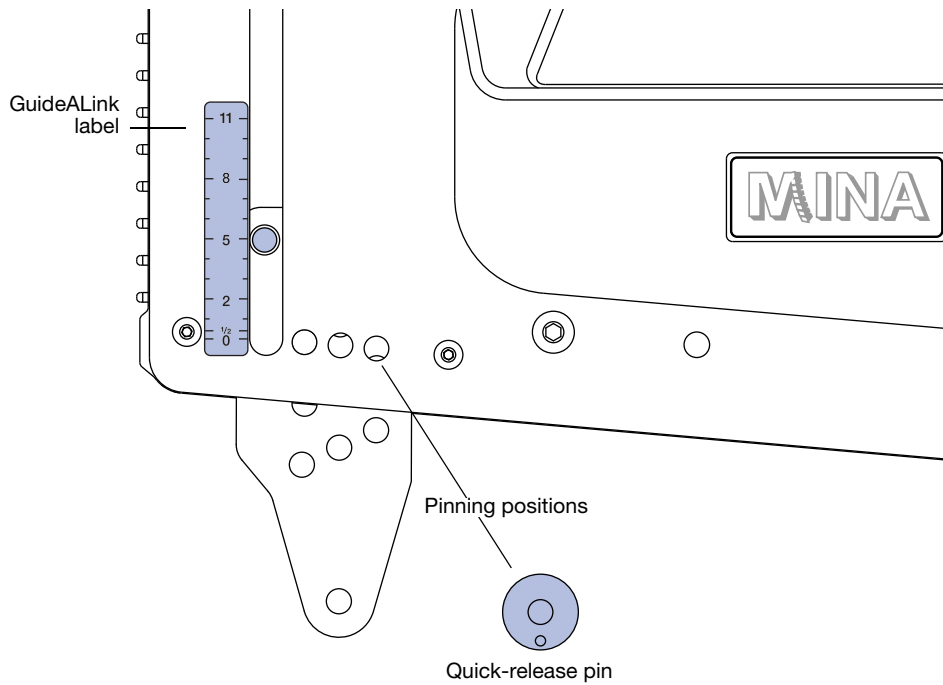
Rear GuideALinks

The rear GuideALinks permit splay angles between linked MINAs at 0.0, 0.5, and 1–11 degrees in 1-degree increments. The rear GuideALink includes three rows of holes corresponding to the available splay angles (see Figure 1 on page 11) that are secured in one of three pinning positions at the bottom of the unit.



MINA Rear GuideALinks

The label in the lower left corner of the end frame shows the splay angle between MINAs the GuideALink position. With the knob at the bottom, the splay angle is 0 degrees. As the knob is moved up, the angle increases (all the way to 11 degrees). To stow the link, the knob is moved all the way to the top of the slot.



MINA Rear GuideALink Label and Pinning Positions

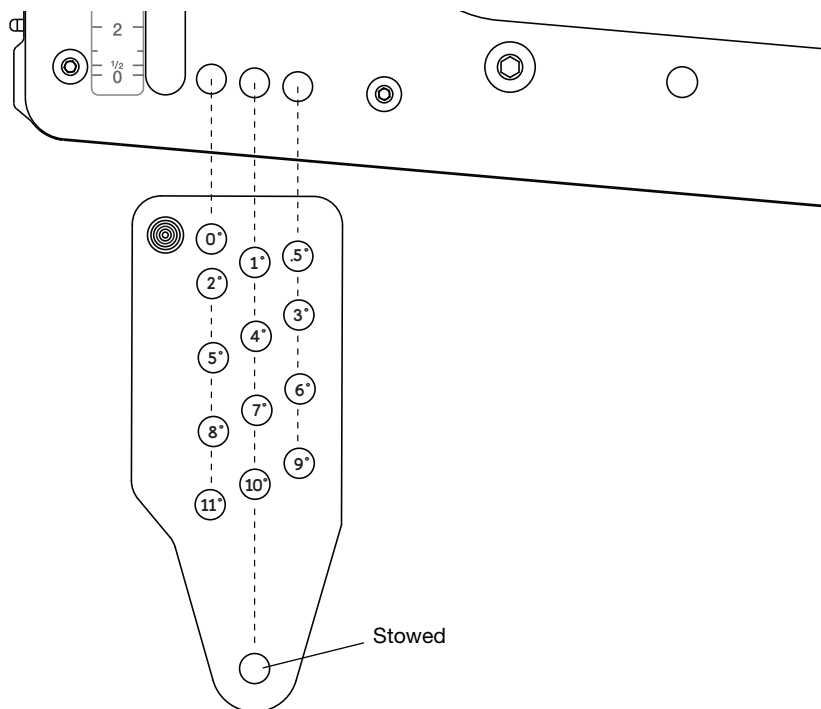


Figure 1: MINA Rear GuideALink, Splay Angles for Linked MINAs



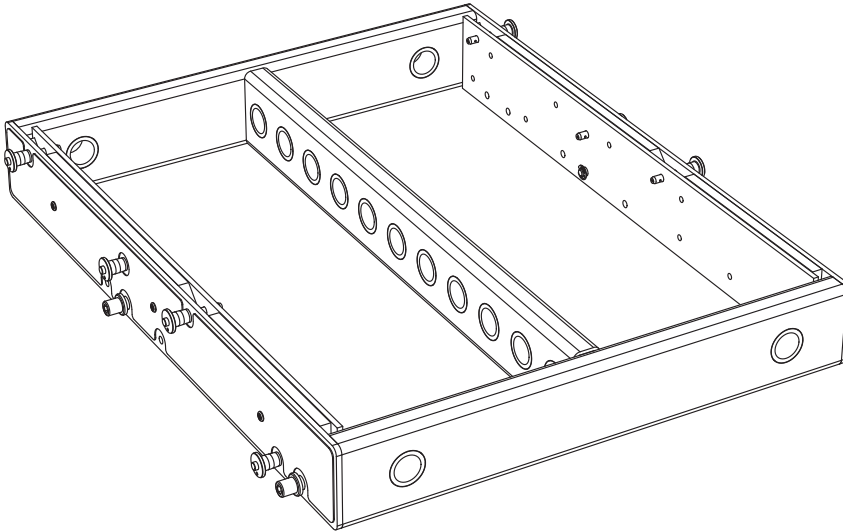
NOTE: The splay angles listed on the GuideALink label are for relative angles between the center axes of the linked units. For example, setting the GuideALink to “5” yields a 5-degree downtilt of the lower unit to the upper unit. How the loudspeakers relate to the floor, stage, and seating angles in the venue depends on the orientation of the MG-MINA grid, the angles of the loudspeakers in the array above them, whether they are flown or ground-stacked, and other factors. MAPP Online Pro can be used to calculate optimum splay angles for loudspeakers and predict coverage patterns for arrays.



NOTE: Optimal acoustical performance for MINA arrays is achieved by using the appropriate number of units and appropriate splay angles to meet the coverage requirements of the venue. You can use the design guidelines for MINA arrays documented in the *MINA Operating Instructions*, along with MAPP Online Pro to verify designs and rigging configurations.

CHAPTER 3: MG-MINA GRID


The MG-MINA grid flies MINA arrays of up to 12 cabinets at a 7:1 safety ratio, or up to 16 cabinets at a 5:1 safety ratio. The grid, which can also be used for groundstacking arrays, accommodates a variety of pickup configurations with four side pickup points and 11 center pickup points.




MG-MINA Grid

The MG-MINA grid has four captive links, two per side, that attach to the top MINA in flown arrays. The configuration of the links and orientation of the grid (for either maximum uptilt or maximum downtilt) determine the angle of the attached MINA. The grid links are easily stowed for transport and groundstacked configurations.

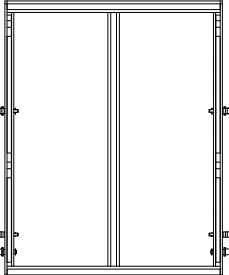
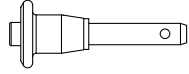
The MG-MINA grid includes eight (1/4" x 0.90") quick-release pins: four for securing the four grid links, and four for securing MINA groundstacks to the top of the grid.

 **CAUTION:** Always use the quick-release pins included with the MG-MINA grid to secure its links, as well as to secure groundstacked MINAs to the grid. Do not use the quick-release pins included with MINA in the grid as they are shorter and will not lock in place.

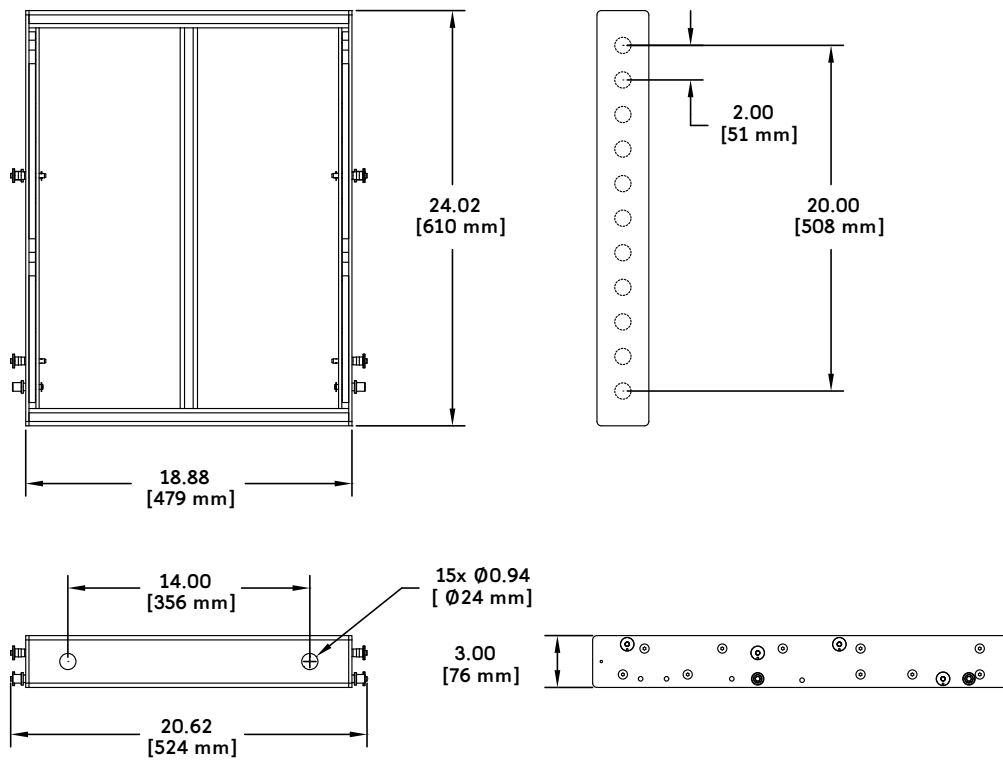
 **TIP:** The MG-MINA grid can travel installed on top of MINA stacks.

MG-MINA Grid Kit Contents

PN 40.207.101.01

	Quantity	Part Number	Description
	1	45.207.126.01	MG-MINA grid
	8	134.036	1/4" x 0.90" quick-release pins

MG-MINA Grid Dimensions



MG-MINA Grid Weight: 34.7 lbs (15.74 kg)

MG-MINA GRID LOAD RATINGS

The following table lists the maximum suspended weight for the MG-MINA grid.

Table 1: MG-MINA Load Ratings

Orientation	Safety Factor	Maximum Suspended Weight	Maximum Number of MINA Cabinets	Maximum Grid Tilt
Maximum Downtilt	7:1	495 lbs (225 kg)	12	±60°
	5:1	660 lbs (300 kg)	16	±60°
Maximum Uptilt	7:1	495 lbs (225 kg)	12	±60°
	5:1	660 lbs (300 kg)	16	±60°

Requirements for MG-MINA Grid Load Ratings

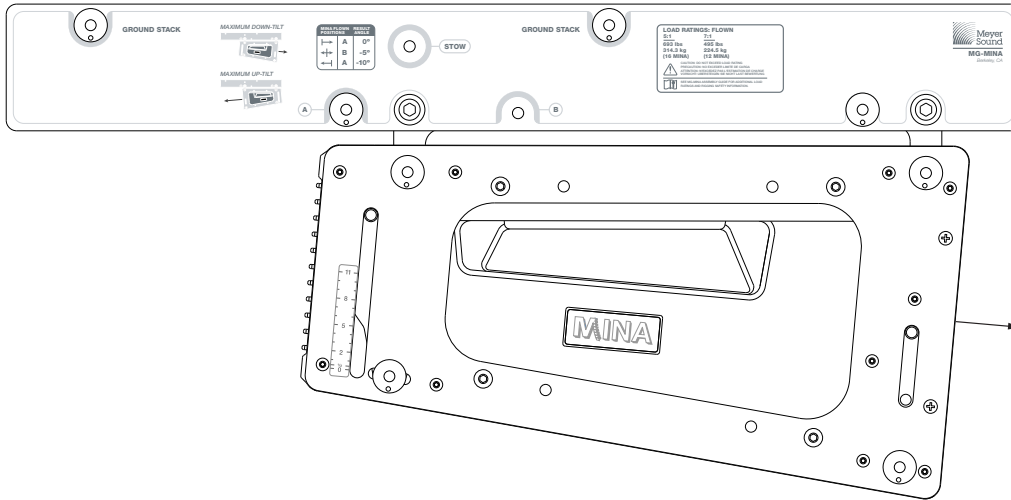
The load ratings in Table 1 are only supported when the following requirements are observed:

- Any combination of grid pickup points can be used. However, if a bridle is used between pickup points, the bridle angle at the apex must not be greater than 90 degrees.
- Using a bridle leg shorter than the recommended length for each configuration will reduce the load rating and may damage the MG-MINA grid.
- The array should not be pulled from points other than those on the grid.
- Pull-back points should not be used to tilt the array.
- The grid tilt should not be larger than the one achieved by the natural rotation of the array.
- The grid tilt should not be greater than the angles in Table 1 with respect to the horizontal. Negative angles are downtilt and positive angles are uptilt.
- The maximum number of MINA loudspeakers that can be flown is based on a weight of 41.2 lbs (18.69 kg) for each MINA cabinet.
- The maximum load ratings regard the MG-MINA grid and flown loudspeakers as a system, including links and pins. Thus, the maximum stress point could change from one element to another in the system.
- The weight of any additional items suspended with the array, such as downfill loudspeakers, transition accessories, and cable, must be considered when calculating the maximum load.
- The weight of the MG-MINA grid has not been included in Table 1. The table rates the maximum load for the grid. Pickup points and motors that will suspend the grid must be rated to support the total weight of the grid (34.7 lbs, 15.74 kg) and its suspended loudspeakers (see Table 1).
- Always use properly rated rigging hardware. 5/8-inch shackles are recommended for the MG-MINA pickup points.

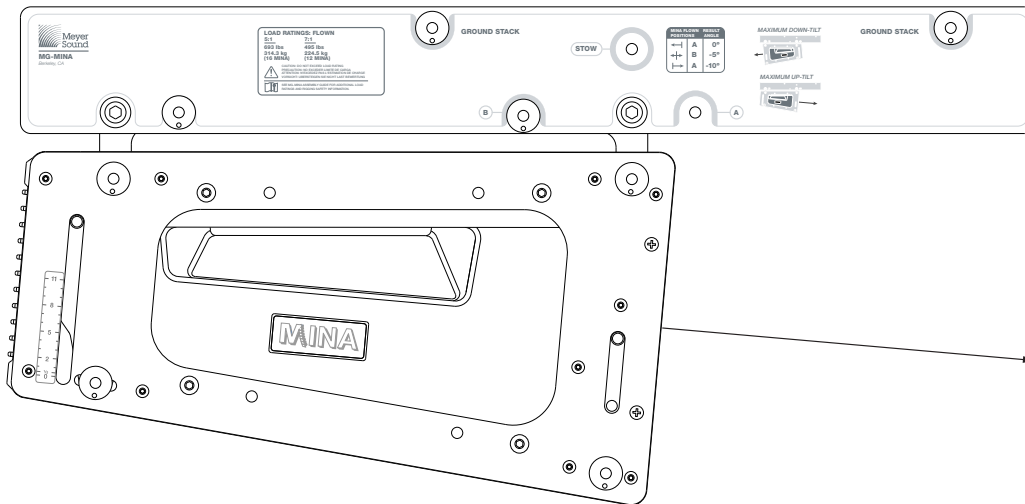
CHAPTER 4: FLYING MINA ARRAYS WITH THE MG-MINA GRID

MG-MINA GRID ORIENTATIONS FOR FLOWN CONFIGURATIONS

The orientation of the MG-MINA grid allows you to place the array's center of gravity closer to the front or rear of the grid, thereby determining the maximum downtilt or uptilt available for the flown array.



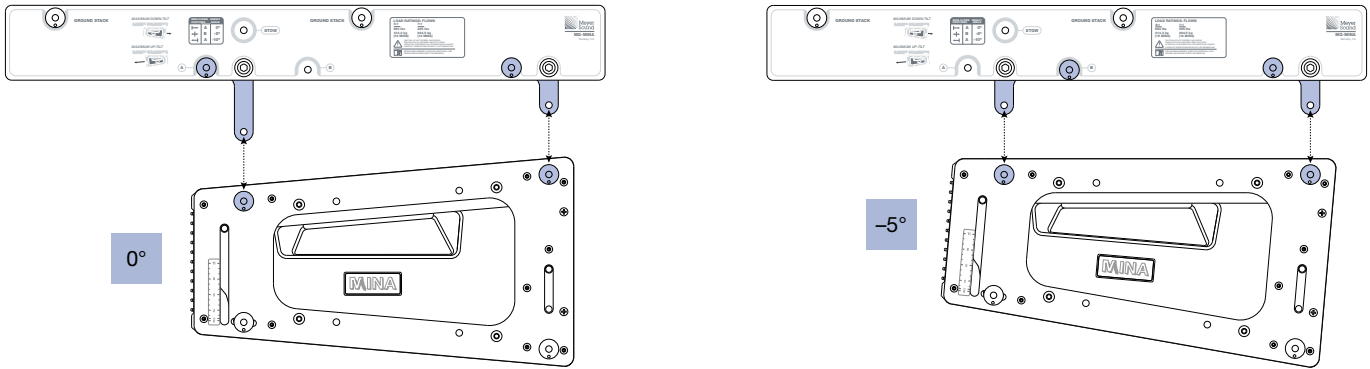
MINA Closer to Front of MG-MINA for Maximum Array Downtilt




MINA Closer to Rear of MG-MINA for Maximum Array Uptilt

MG-MINA Oriented for Maximum Array Downtilt

When the MG-MINA grid is oriented with its links near the front of the flown loudspeakers, the array's center of gravity is placed closer to the front of the grid so that the grid's rear pickup points can be used to achieve maximum array downtilt. The label on the MG-MINA shows this configuration as "Maximum Downtilt." With the maximum downtilt orientation, the MINA at the top of the array can be attached to the grid at 0 and -5 degree (downtilt).

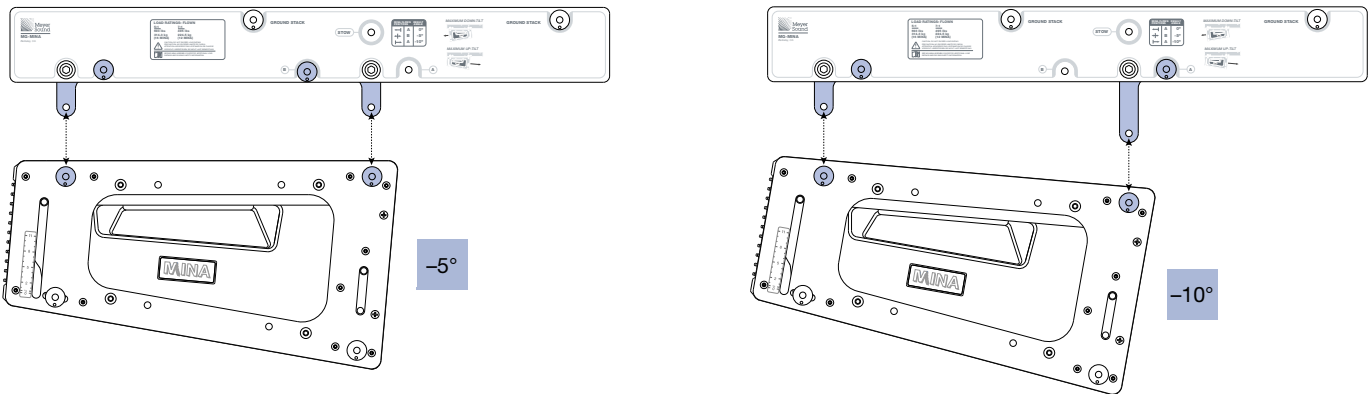


MG-MINA Grid, Maximum Downtilt Orientation, 0 and -5 Degrees


 **TIP:** The tilt for the MG-MINA and the array hung below it can be tilted by using chain motors, or differing lengths of steel or SpanSets.

MG-MINA Oriented for Maximum Array Uptilt

When the MG-MINA grid is oriented with its links near the rear of the flown loudspeakers, the array's center of gravity is placed closer to the rear of the grid so that the grid's rear pickup points can be used to achieve maximum array uptilt. The label on the MG-MINA shows this configuration as "Maximum Uptilt." With the maximum uptilt orientation, the MINA at the top of the array can be attached to the grid at -5 and -10 degrees (downtilt).



MG-MINA Grid, Maximum Uptilt Orientation, -5 and -10 Degrees

 **TIP:** The tilt for the MG-MINA and the array hung below it can be tilted by using chain motors, or differing lengths of steel or SpanSets.

MG-MINA PICKUP CONFIGURATIONS

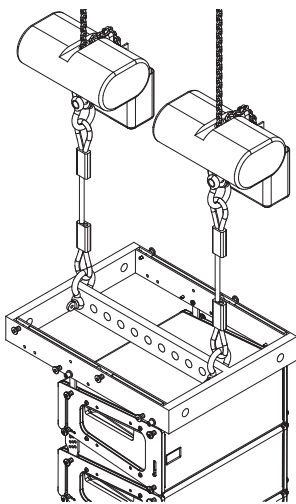
The MG-MINA grid accommodates a variety of pickup configurations with its front and rear pickup points (two each) and 11 center pickup points. When possible, use the front and rear pickup points to change the tilt of the grid with the front and rear motors. You can also bridle between pickup points for greater stability, as compared to single front and rear pickup points.

CAUTION: Always use properly rated rigging hardware. 5/8-inch shackles are recommended for the MG-MINA's pickup points.

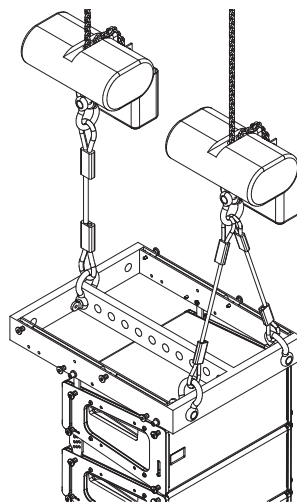
CAUTION: When using bridles between pickup points on the MG-MINA, the angle of the bridle at the apex should not be greater than 90 degrees to avoid increasing the load on the bridles and damaging the grid.

MG-MINA Pickup Configurations with Two Motors

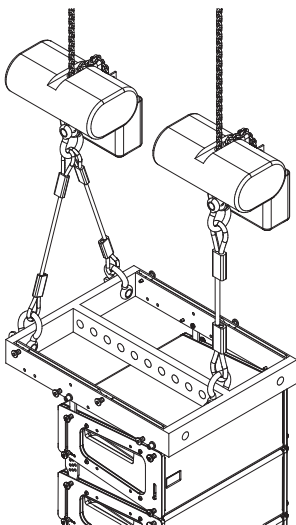
The following examples show pickup configurations with two motors.



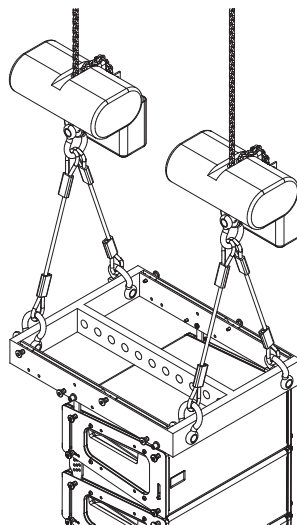
Two attachment points, front and rear center



Three attachment points, front bridle



Three attachment points, rear bridle

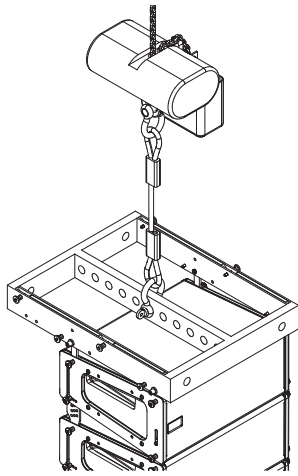


Four attachment points, front and rear bridles

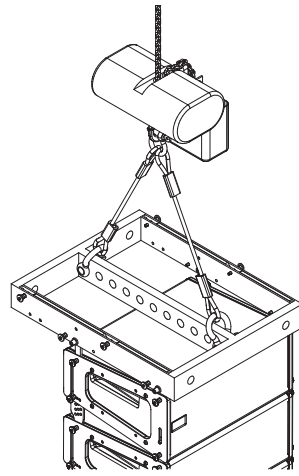
CAUTION: When suspending MG-MINA arrays from two motors, make sure each motor and ceiling pickup point (above the hook) are rated to hold the total weight of the grid and array.

MG-MINA Pickup Configurations with One Motor

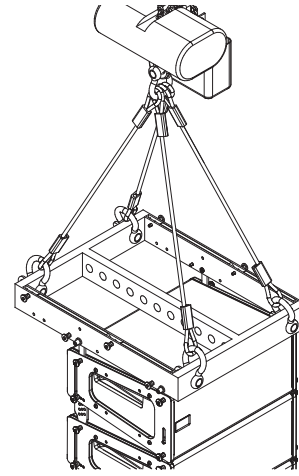
The following examples show pickup configurations with a single motor. While single motor configurations are supported, it is more difficult to change the tilt of the grid with these configuration (when compared to configurations with two motors).



One attachment point, center



Two attachment points, front and rear center



Four attachment points, four corners



CAUTION: When suspending MG-MINA arrays from a single motor, make sure the motor and ceiling pickup point (above the hook) are rated to hold the total weight of the grid and array.



TIP: MAPP Online Pro's Center of Gravity feature lets you easily determine the appropriate center pickup hole in the MG-MINA. For more information, see "Estimating the Center Pickup Point with MAPP Online Pro" on page 21.

MAPP ONLINE PRO AND RIGGING

MAPP Online Pro is a powerful, cross-platform application for accurately predicting the coverage pattern, frequency response, impulse response, and maximum SPL output of single or arrayed Meyer Sound loudspeakers. Residing on your local computer, the MAPP Online Pro client lets you configure Meyer Sound loudspeaker systems and define the environment in which they will operate, including air temperature, pressure, and humidity.

MAPP Online Pro provides a wealth of rigging information for loudspeaker arrays by automatically calculating the following values for specific array configurations:

- Total weight of array
- Height and depth of array
- Array's center of gravity (required for determining the center pickup point and maximum uptilt and downtilt)
- Load distribution for front and rear points

Downloading and Installing MAPP Online Pro

To use MAPP Online Pro, register at the following link:

<http://www.meyersound.com/products/mapponline/pro/register/>

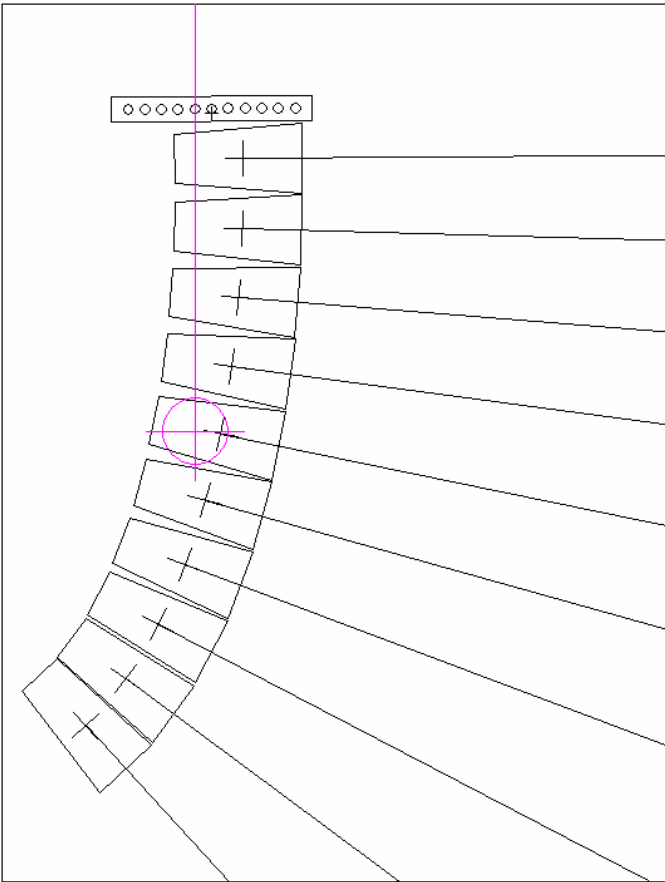
After entering your registration information, an email will be sent to you with your user name, password, and the MAPP Online Pro download location. On-screen instructions will guide you through the download and installation process.

The MAPP Online Pro client software is regularly upgraded to add support for the latest Meyer Sound loudspeakers, as well as to add feature enhancements. Most upgrades are downloaded automatically when logging on to a MAPP Online Pro session. The MAPP Online Pro database includes nearly all of the current Meyer Sound loudspeakers, subwoofers, and processors.

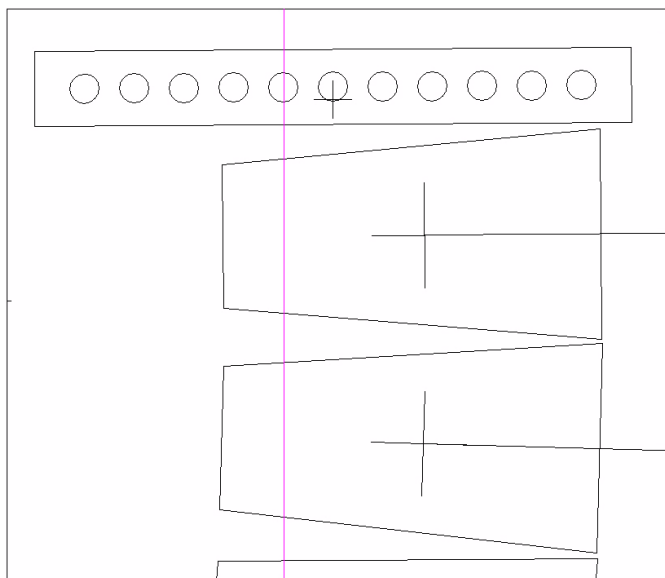
Estimating the Center Pickup Point with MAPP Online Pro

To estimating the center pickup point with MAPP Online Pro:

1. In Mapp Online Pro, choose **Insert > Insert Loudspeaker System**.
2. In the Flown Loudspeaker System dialog box, do the following:
 - In the Reference Rig Point section, set the **X** and **Y** coordinates for the MG-MINA grid.
 - At the top of the Loudspeaker System Elements section, set the grid to either **MG-MINA forward** or **MG-MINA rearward**, depending on whether downtilt or uptilt is required.
 - Click **Insert Rows** to add additional MINA loudspeakers to the array as necessary. Make sure the Total Weight shown in the lower right of the window does not exceed acceptable load ratings for the MG-MINA grid (see “MG-MINA Grid Load Ratings” on page 15).
 - Enter **Splay** angles for each loudspeaker.
 - Click **OK** to close the Flown Loudspeaker System dialog box.
3. Select **View > Center Line**. Loudspeaker output lines are displayed in the Sound Field.
4. If necessary, adjust the MG-MINA grid height and grid angle to meet the system’s acoustical requirements. These properties can be adjusted by entering values in the Edit Flown Loudspeaker Properties dialog box, or by manually dragging the grid with the Select and Rotate tools in the Sound Field. For more information, refer to the *MAPP Online Pro User Guide* available at www.meyersound.com.
5. Select **View > Array CoG**. A magenta line representing the array’s center of gravity is displayed in the Sound Field.
6. In the Mapp Online Pro Window, in the upper right, click **Zoom** and then draw a rectangle around the grid in the Sound Field. The center of gravity is displayed near one of the grid pickup holes.
7. Adjust the grid angle until the center of gravity falls in the center of the nearest pickup hole. This is the angle at which the array will be flown when suspended from that pickup point.
8. Adjust further, if necessary, the grid height and grid angle until the system’s acoustical requirements are met and the center of gravity falls in the center of one of the grid’s pickup holes.



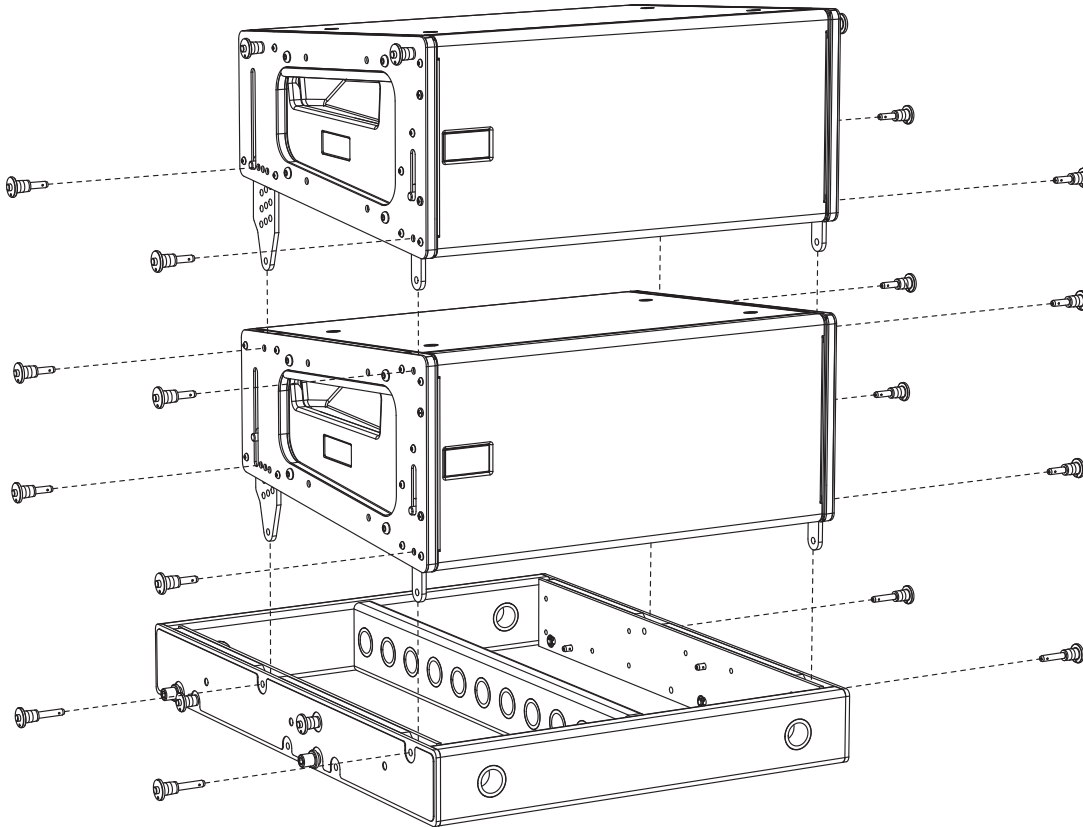
MAPP Online Pro Showing MINA Array with Center of Gravity



MAPP Online Pro Showing Zoomed MINA Array with Center of Gravity

CHAPTER 5: GROUNDSTACKING MINA ARRAYS WITH THE MG-MINA GRID

The MG-MINA grid can safely groundstack up to six MINA loudspeakers. When used for groundstacking, the grid should be oriented so the center of gravity for the stacked loudspeakers is near the center of the grid. The MINA at the bottom of the stack attaches directly to the grid with its GuideALinks and is secured with the 1/4" x 0.90" quick-release pins included with the grid. The configuration of the rear GuideALinks for the attached MINA determines its tilt, which can be from +6 degrees (uptilt) to -5 degrees (downtilt). The groundstacked array can be curved by adjusting the rear GuideALink positions of the units stacked above the bottom MINA.



MG-MINA Grid with Groundstacked MINA

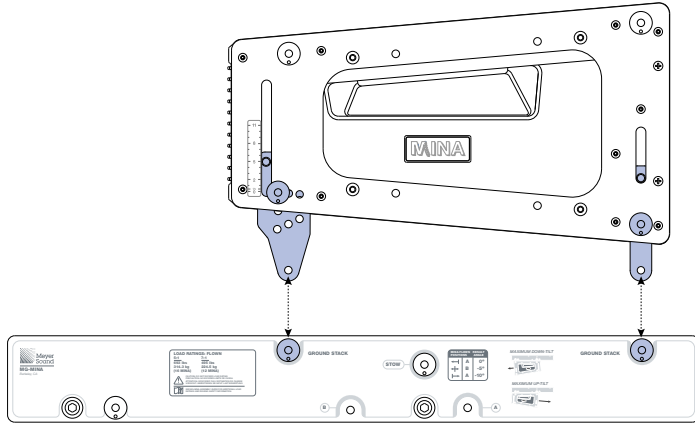
CAUTION: Always use the quick-release pins included with the MG-MINA grid to secure its links, as well as to secure groundstacked MINAs to the grid. Do not use the quick-release pins included with MINA in the grid as they are shorter and will not lock in place.

NOTE: While it may be possible to safely groundstack up to seven or eight units with MG-MINA grid, you should only do so if the stack's center of gravity is near the center of the grid. Groundstacks with extreme tilts place the center of gravity further from the grid's center and may be it as risk of tipping.

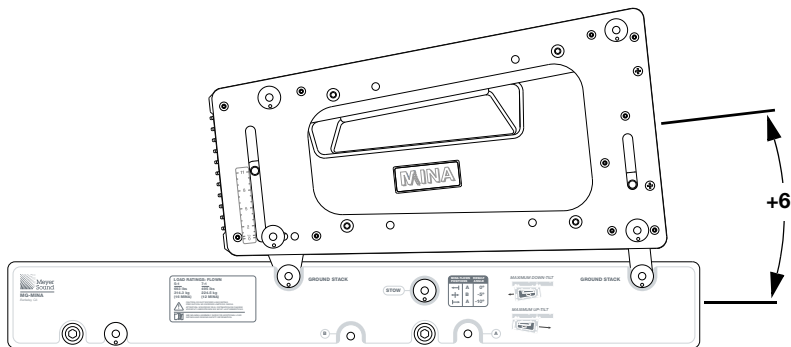
CAUTION: To secure groundstacked arrays, particularly in outdoor situations, use tie downs or weights with the grid, as well as a safety system on the array.

ANGLES FOR GROUNDSTACKED MINAS WITH THE MG-MINA

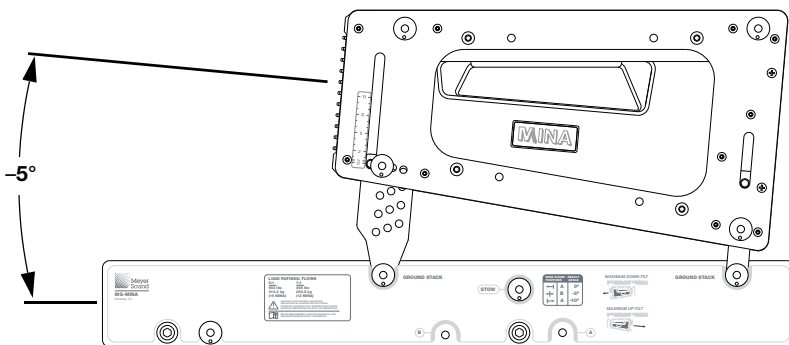
For groundstacked configurations with the MG-MINA, the angle for the bottom MINA attached to the grid can be from +6 degrees (uptilt) to -5 degrees (downtilt). Table 2 on page 25 lists the available angles and the corresponding label positions for the rear GuideALinks.



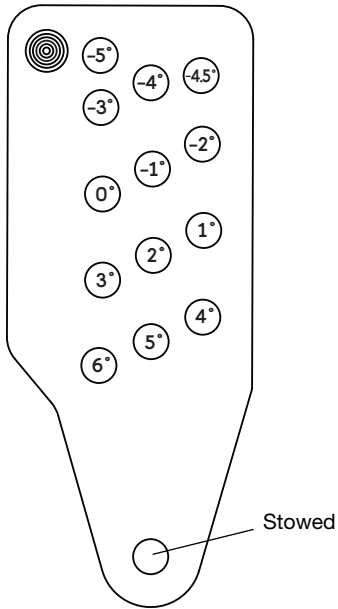
MG-MINA Grid with Groundstacked MINA, 0 Degrees



MG-MINA Grid with Groundstacked MINA, +6 Degrees Uptilt



MG-MINA Grid with Groundstacked MINA, -5 Degrees Downtilt



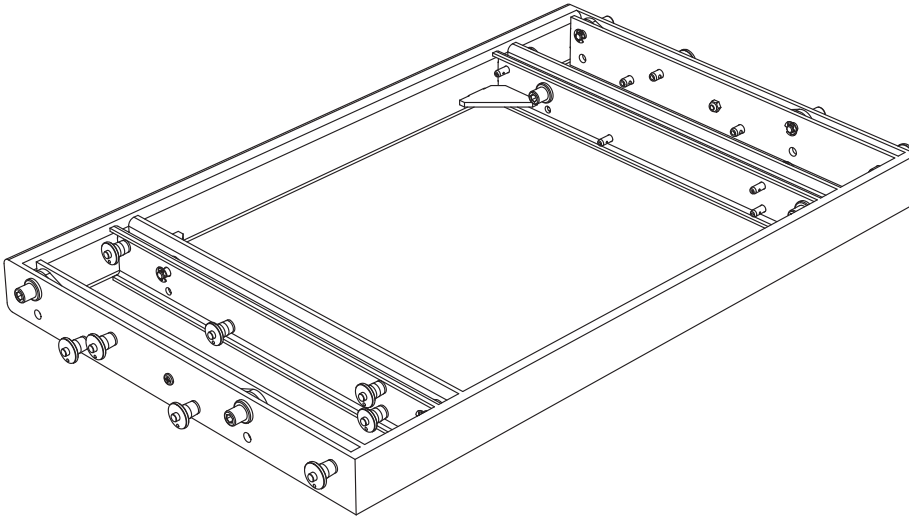
MINA Rear GuideALink Angles for Groundstacked Units

Table 2: MG-MINA Groundstack Angles

Rear GuideALink Label Position	Actual Groundstack Angle
0	-5°
0.5	-4.5°
1	-4°
2	-3°
3	-2°
4	-1°
5	0°
6	+1°
7	+2°
8	+3°
9	+4°
10	+5°
11	+6°

CHAPTER 6: MTF-M'ELODIE/MINA TRANSITION FRAME

The MTF-M'elodie/MINA transition frame flies up to 12 MINA loudspeakers at a 7:1 safety factor below M'elodie or 500-HP arrays. The transition frame can also be used for stacking up to six MINA loudspeakers on top of 500-HP subwoofers. The transition frame includes slots on top of the frame for attaching to M'elodies or 500-HPs; the transition frame also includes captive links for attaching to flown MINAs or groundstacked 500-HPs.



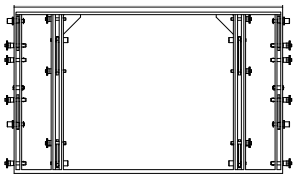
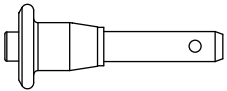
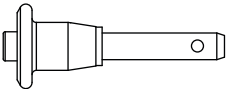
MTF-M'elodie/MINA Transition Frame

The MTF-M'elodie/MINA transition frame includes the required quick-release pins and links for the following transitions:

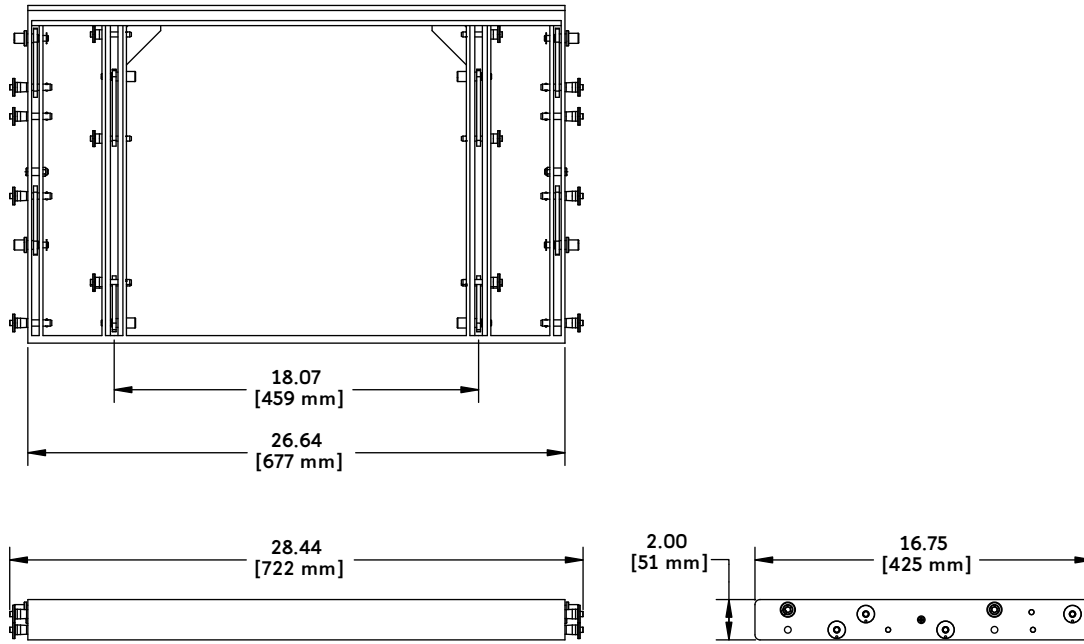
- M'elodies flown with MINAs below
- 500-HPs flown with MINAs below
- 500-HPs groundstacked with MINAs above

MTF-M'elodie/MINA Kit Contents

PN 40.207.103.01

	Part Number	Quantity	Description
	45.207.126.01	1	MTF-M'elodie/MINA transition frame
	134.025	8	5/16" x 0.875" red quick-release pins (M'elodie, 500-HP)
	134.036	8	1/4" x 0.90" black quick-release pins (MINA)

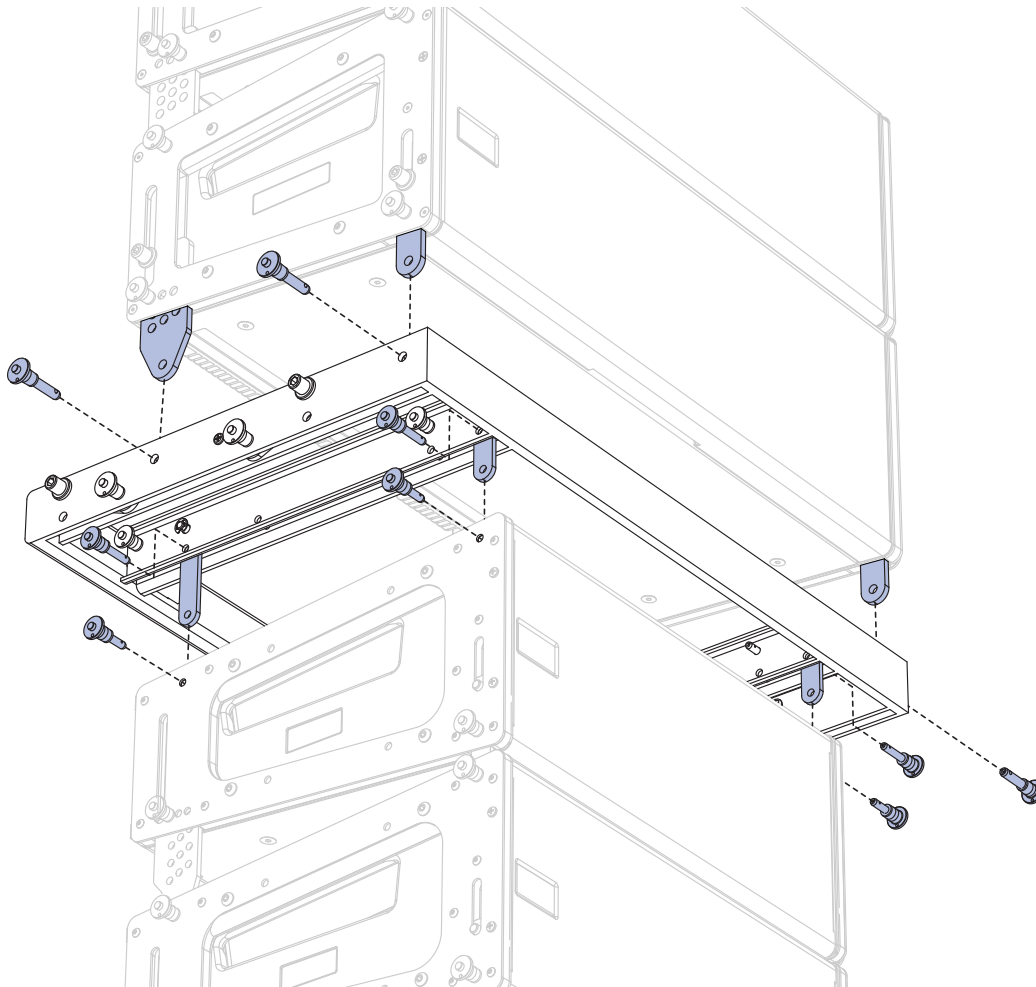
MTF-M'elodie/MINA Dimensions



MTF-M'elodie/MINA Weight: 24.7 lbs (11.2 kg)

M'ELODIE ARRAY WITH FLOWN MINAS

When flying MINA loudspeakers below M'elodie arrays (for downfill), the MTF-M'elodie transition frame is placed between the bottom M'elodie and the top MINA. The transition frame attaches to the M'elodie's GuideALinks and is secured with the transition frame's outer quick-release pins. The positions of the M'elodie's rear GuideALinks determine the angle of the transition frame, which can be from +5 to -6 degrees. The MINA attaches to the transition frame's inner links and is secured with the MINA's quick-release pins. The MINA attaches to the transition frame at an angle of 0 degrees.



MTF-M'elodie/MINA Transition Frame, M'elodie Array with Flown MINAs

CAUTION: Make sure to use the appropriate quick-release pins when securing M'elodie and MINA loudspeakers to the transition frame. Use the red 5/16" x 0.875" quick-release pins in the outer frame to secure the M'elodie. Use the black 1/4" x 0.90" quick-release pins in the inner frame to secure the MINA.

M'elodie Array with Flown MINAs, MTF-M'elodie/MINA Load Ratings

The following table lists the maximum suspended weight for the MTF-M'elodie/MINA transition frame when flying MINA loudspeakers below M'elodie arrays.

Table 3: MTF-M'elodie/MINA Load Ratings, MINA Loudspeakers Flown Below M'elodie Arrays

Safety Factor	Maximum Suspended Weight	Maximum Number of MINA Cabinets	Maximum Frame Tilt
7:1	744 lbs (337 kg)	12	0–10°
7:1	620 lbs (281 kg)	10	10–45°
7:1	496 lbs (225 kg)	8	+45°

Requirements for MTF-M'elodie/MINA Load Ratings

The load ratings in Table 3 are only supported when the following requirements are observed:

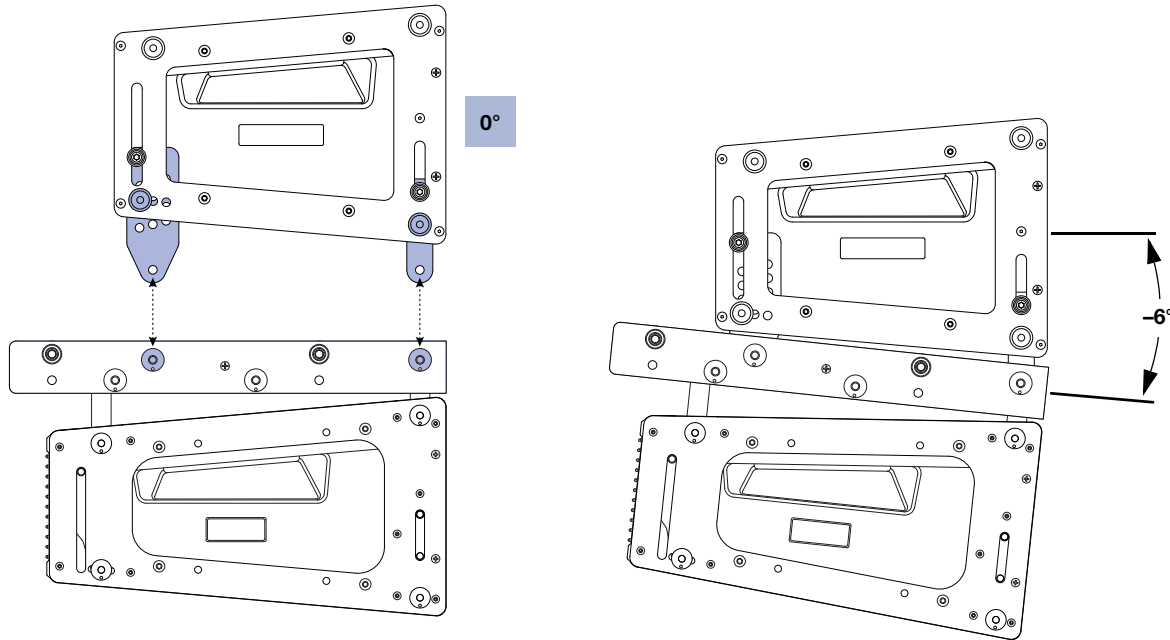
- The array should not be pulled from points other than those on the MG-M'elodie grid.
- The array tilt should not be greater than the one achieved by the natural rotation of the array.
- The grid tilt should not be larger than the one achieved by the natural rotation of the array.
- The grid tilt should not be greater than the angles in the Table 3 with respect to the horizontal. Negative angles are down-tilt and positive angles are up-tilt.
- The maximum number of MINA loudspeakers that can be flown is based on a weight of 41.2 lbs (18.69 kg) for each MINA cabinet.
- The maximum load ratings regard the MTF-M'elodie/MINA transition frame and flown loudspeakers as a system, including links and pins. Thus, the maximum stress point could change from one element to another in the system.
- The weight of the MTF-M'elodie/MINA transition frame has not been included in Table 3. The table rates the maximum load for the transition frame. Grids, pickup points, and motors that will suspend the transition frame must be rated to support the total weight of the frame (24.7 lbs, 11.2 kg) and its suspended loudspeakers (see Table 3).
- Always use properly rated rigging hardware. 5/8-inch shackles are recommended for the MG-M'elodie grid pickup points.



CAUTION: When adding an MTF-M'elodie/MINA transition frame and MINA loudspeakers to a M'elodie array, make sure not to exceed the maximum load rating for the MG-M'elodie multipurpose (top) grid. For information on MG-M'elodie load ratings, refer to the MG-M'elodie Multipurpose Grid and Accessories Assembly Guide (PN 05.152.019.01).

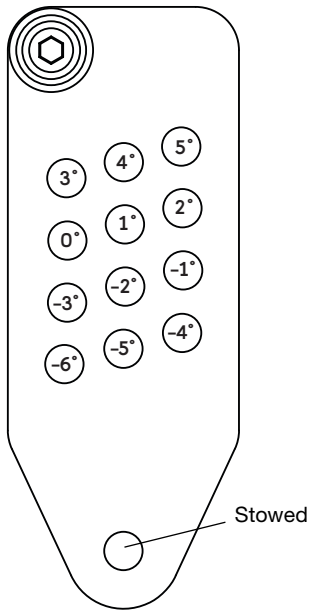
M'elodie Array with Flown MINAs: Angle for Transition Frame

When flying MINA loudspeakers below M'elodie arrays (for downfill), the MTF-M'elodie/MINA transition frame can be attached to the bottom M'elodie at angles from +5 to -6 degrees. The positions of the M'elodie's rear GuideALinks determine the angle between the M'elodie and transition frame.



M'elodie Array with Flown MINA, Transition Frame Angles

NOTE: Although the M'elodie can be attached to the MTF-M'elodie/MINA transition frame at positive angles (from +1 to +5 degrees), these angles are not recommended as they would cause the M'elodie's coverage to interfere with that of the MINAs flown below the transition frame. Make sure to use MAPP Online Pro to determine optimum transition frame angles between arrays.



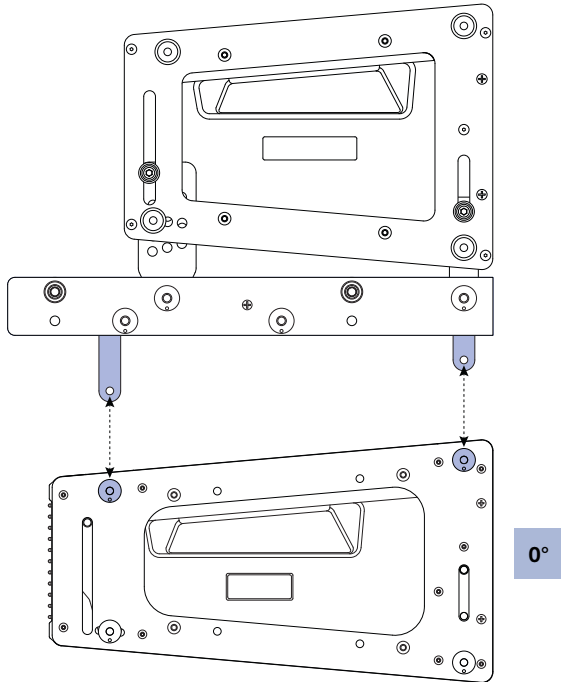
M'elodie Rear GuideALink Positions

M'elodie GuideALink Positions for Transition Frame Angles

M'elodie Rear GuideALink Label Position	Actual Angle for Attached Transition Frame
0	+5°
1	+4°
2	+3°
3	+2°
4	+1°
5	0°
6	-1°
7	-2°
8	-3°
9	-4°
10	-5°
11	-6°

M'elodie Array with Flown MINAs: Angle for Top MINA

When flying MINA loudspeakers below M'elodie arrays (for downfill), the top MINA in the array attaches to the transition frame at an angle of 0 degrees, and is therefore at the same angle as the transition frame with respect to the M'elodie above it. The MINA array can be curved by adjusting the rear GuideALink positions of the units flown below the top MINA.



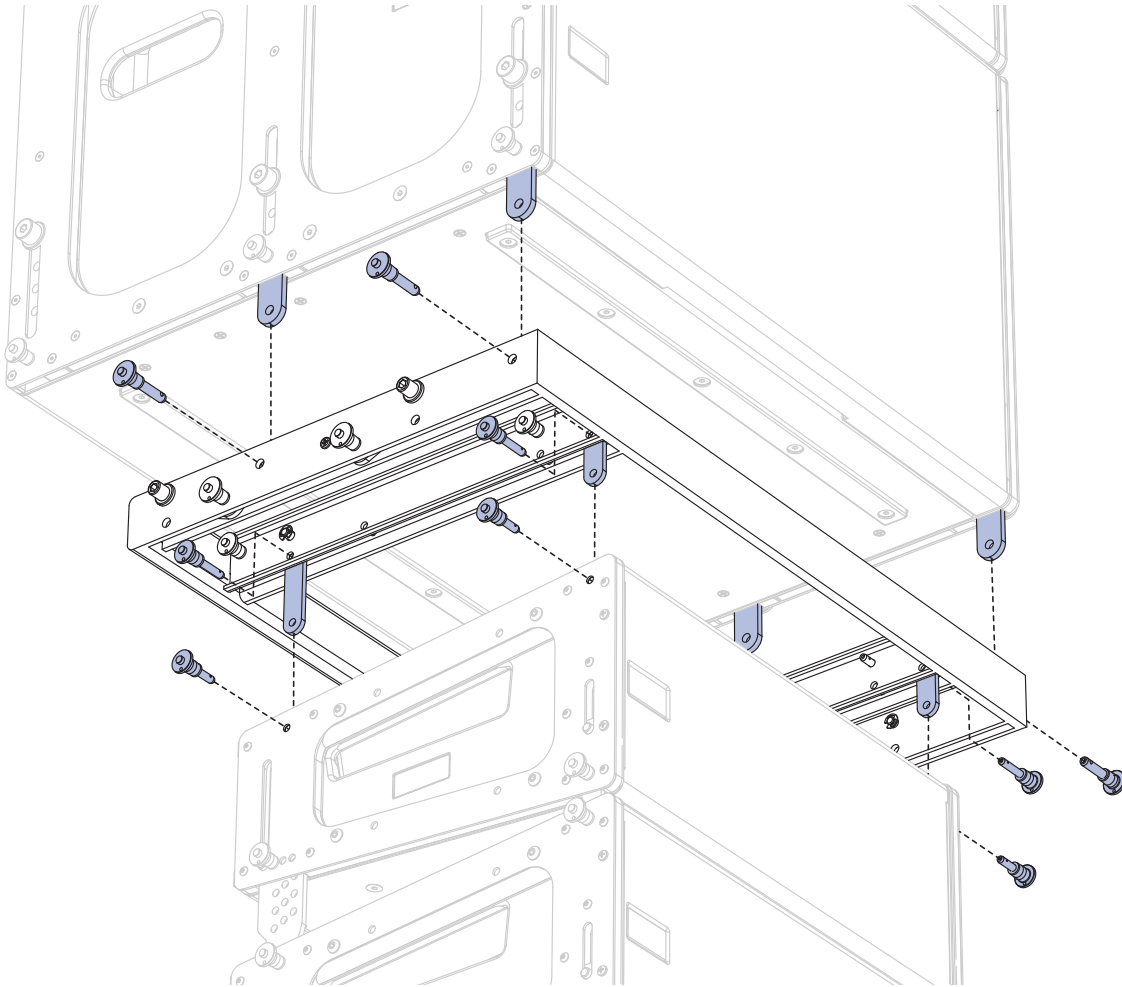
MINA Attached to Transition Frame at 0 Degrees



TIP: You can use MAPP Online Pro to determine optimum transition frame angles between arrays.

500-HP SUBWOOFERS WITH FLOWN MINAS

When flying MINA loudspeakers below 500-HP subwoofers, the MTF-M'elodie transition frame is placed between the bottom 500-HP and the top MINA. The transition frame attaches to the 500-HP's front and center GuideALinks and is secured with the transition frame's outer quick-release pins. The position of the 500-HP's GuideALinks determines the angle of the transition frame, which can be +10, +5, 0, or -5 degrees. The MINA attaches to the transition frame's inner links and is secured with the MINA's quick-release pins. The MINA attaches to the transition frame at an angle of 0 degrees.



MTF-M'elodie/MINA Transition Frame, 500-HP Subwoofers with Flown MINAs

CAUTION: Make sure to use the appropriate quick-release pins when securing the 500-HP subwoofer and MINA loudspeaker to the transition frame. Use the red 5/16" x 0.875" quick-release pins in the outer frame to secure the 500-HP. Use the black 1/4" x 0.90" quick-release pins in the inner frame to secure the MINA.

NOTE: The MTF-M'elodie/MINA transition frame can only be used with 500-HP subwoofers equipped with the optional rigging frames.

500-HP Subwoofers with Flown MINAs, MTF-M'elodie/MINA Load Ratings

The following table lists the maximum suspended weight for the MTF-M'elodie/MINA transition frame when flying MINA loudspeakers below 500-HP subwoofers.

Table 4: MTF-M'elodie/MINA Load Ratings, MINA Loudspeakers Flown Below 500-HP Subwoofers

Number of 500-HPs Above Transition Frame	Maximum Suspended Weight (7:1 Safety Factor)	Maximum Number of MINA Cabinets (7:1 Safety Factor)	Maximum Suspended Weight (5:1 Safety Factor)	Maximum Number of MINA Cabinets (5:1 Safety Factor)
1	495 lbs (225 kg)	12	744 lbs (337 kg)	15
2	495 lbs (225 kg)	12	620 lbs (281 kg)	15
3	495 lbs (225 kg)	10	496 lbs (225 kg)	15
4	290 lbs (132 kg)	7	577 lbs (262 kg)	14
5	165 lbs (75 kg)	4	454 lbs (206 kg)	11
6	125 lbs (57 kg)	3	371 lbs (169 kg)	9
7	Not Supported	Not Supported	248 lbs (113 kg)	6
8	Not Supported	Not Supported	125 lbs (57 kg)	3
9	Not Supported	Not Supported	42 lbs (19 kg)	1

Requirements for MTF-M'elodie/MINA Load Ratings

The load ratings in Table 4 are only supported when the following requirements are observed:

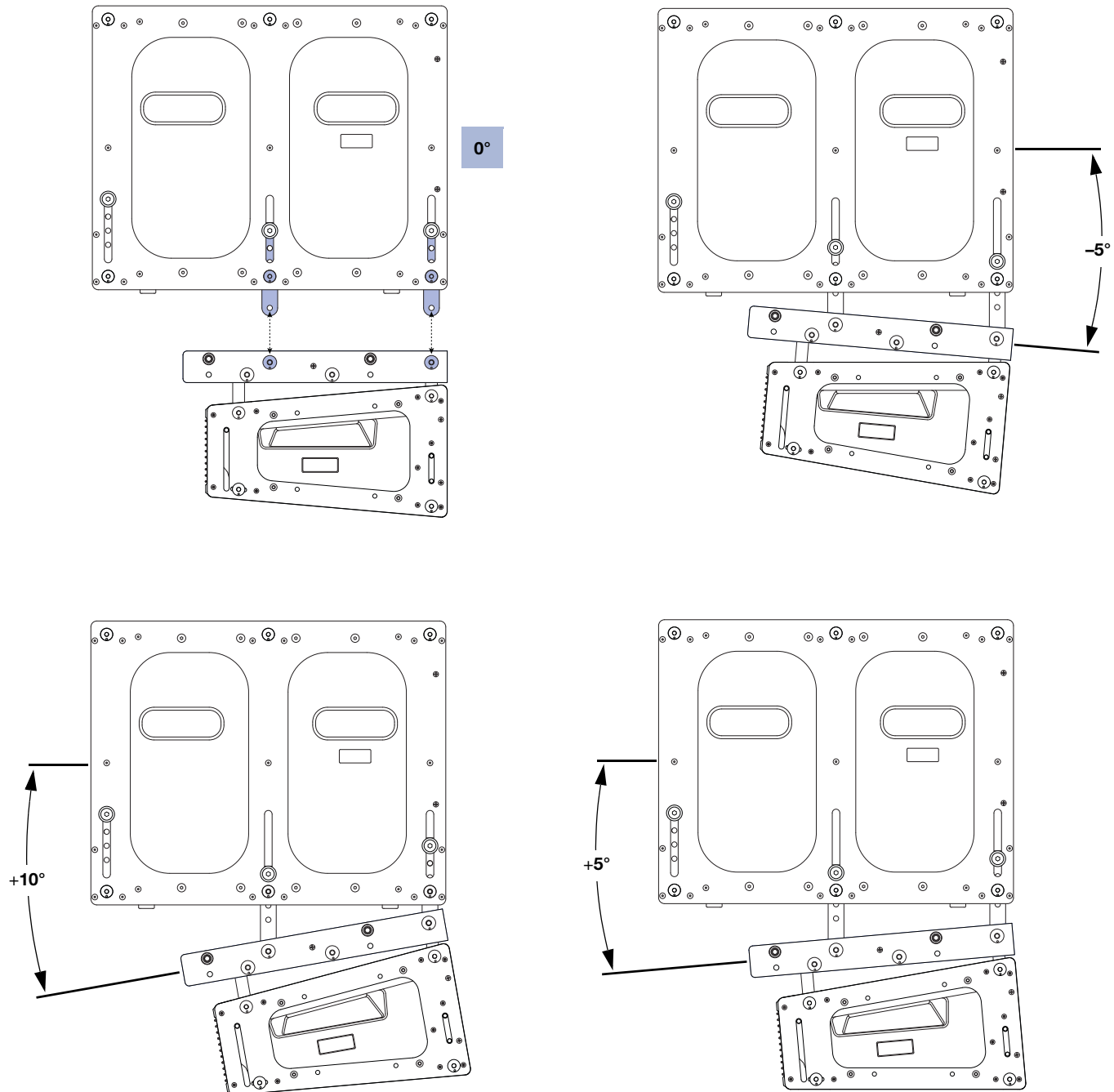
- The array should not be pulled from points other than those on the MG-M'elodie grid.
- The array tilt should not be greater than the one achieved by the natural rotation of the array.
- The grid tilt should not be larger than the one achieved by the natural rotation of the array.
- The grid tilt should not be greater than the angles in the table with respect to the horizontal. Negative angles are downtilt and positive angles are uptilt.
- The maximum number of MINA loudspeakers that can be flown is based on a weight of 41.2 lbs (18.69 kg) for each MINA cabinet.
- The maximum load ratings regard the MTF-M'elodie/MINA transition frame and flown loudspeakers as a system, including links and pins. Thus, the maximum stress point could change from one element to another in the system.
- The weight of the MTF-M'elodie/MINA transition frame has not been included in Table 3. The table rates the maximum load for the transition frame. Grids, pickup points, and motors that will suspend the transition frame must be rated to support the total weight of the frame (24.7 lbs, 11.2 kg) and its suspended loudspeakers (see Table 3).
- Always use properly rated rigging hardware. 5/8-inch shackles are recommended for the MG-M'elodie grid pickup points.



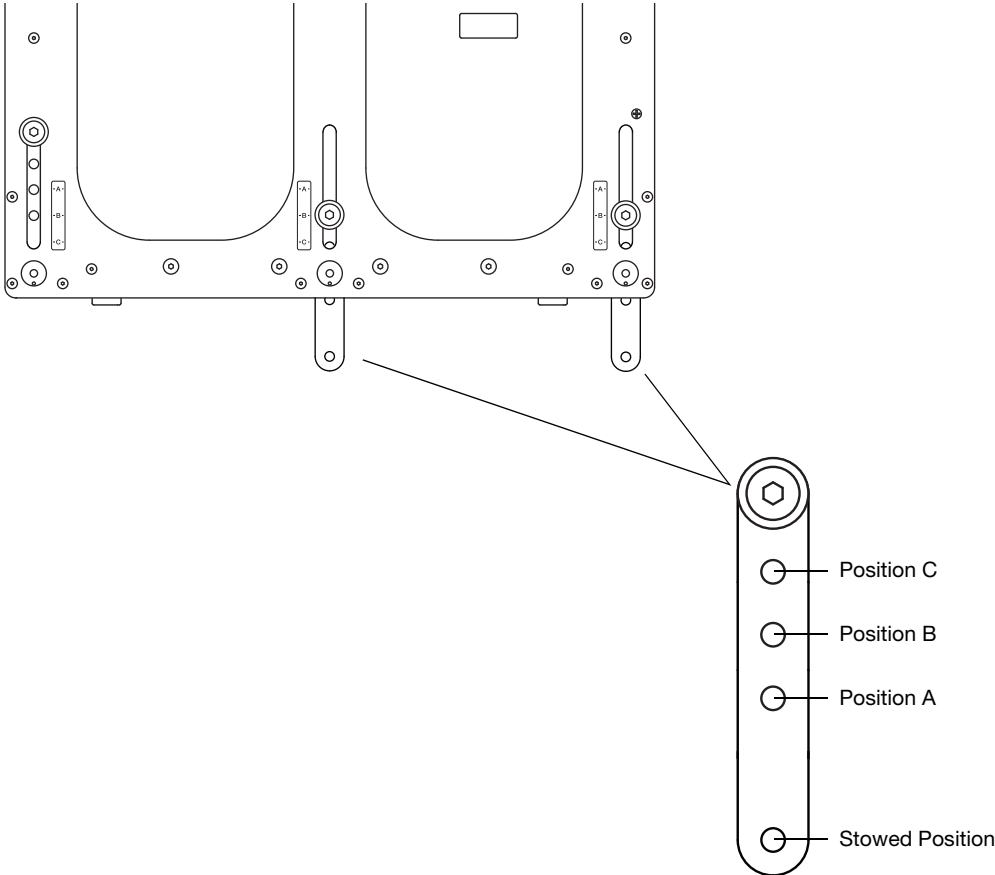
CAUTION: When adding an MTF-M'elodie/MINA transition frame and MINA loudspeakers to a 500-HP array, make sure not to exceed values in Table 4.

500-HP Subwoofers with Flown MINAs: Angle for Transition Frame

When flying MINA loudspeakers below 500-HP subwoofers, the MTF-M'elodie/MINA transition frame can be attached to the bottom 500-HP at angles of +10, +5, 0, or -5 degrees. The position of the 500-HP's GuideALinks determines the angle for the transition frame.



500-HP Subwoofer with Flown MINA: Transition Frame Angles



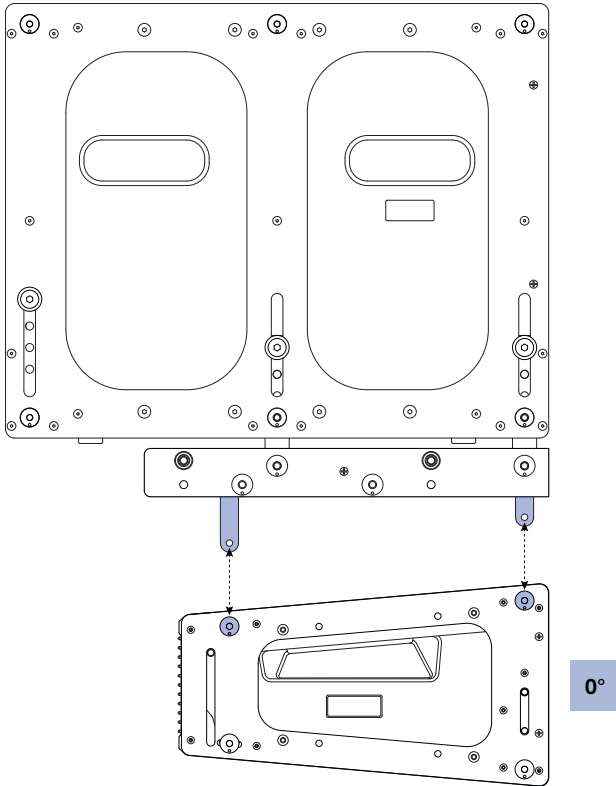
500-HP GuideALink Positions

500-HP GuideALink Positions for Transition Frame Angles

500-HP Center GuideALink Position	500-HP Front GuideALink Position	Transition Frame Angle
C	A	+10°
C	B	+5°
A	A	0°
B	C	-5°

500-HP Subwoofers with Flown MINAs: Angle for Top MINA

When flying MINA loudspeakers below 500-HP subwoofers, the top MINA attaches to the transition frame at an angle of 0 degrees, and is therefore at the same angle as the transition frame with respect to the 500-HP above it. The MINA array can be curved by adjusting the rear GuideALink positions of the units flown below the top MINA.



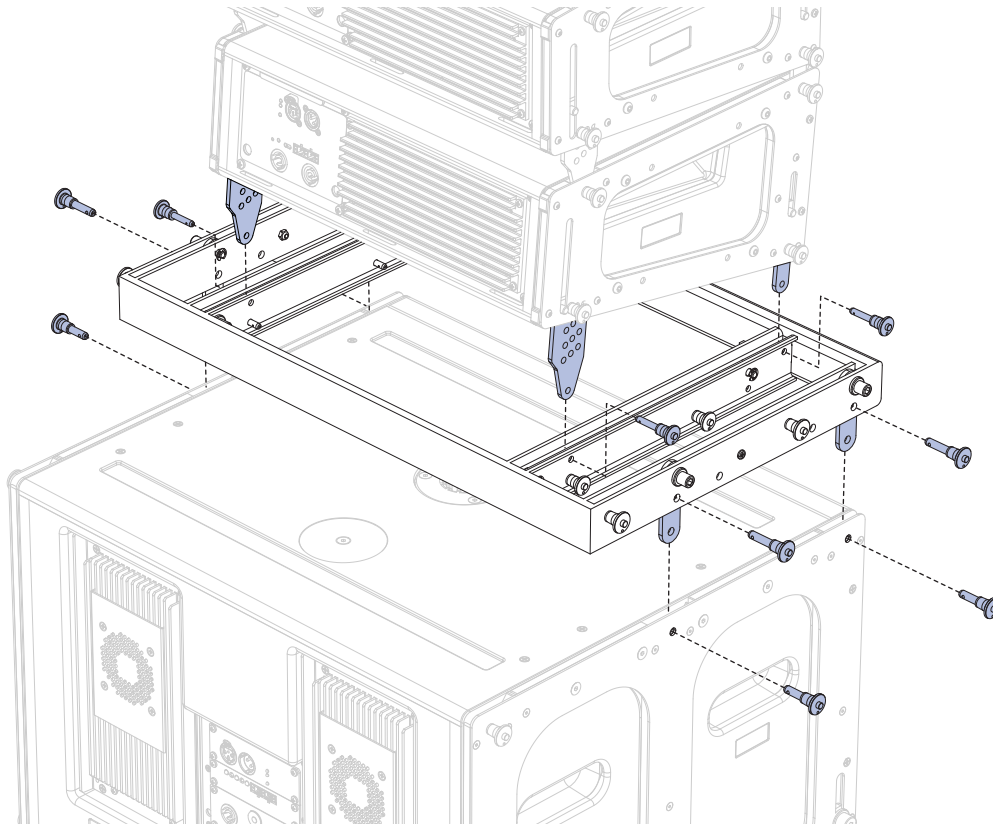
MINA Attached to Transition Frame at 0 Degrees



TIP: You can use MAPP Online Pro to determine optimum transition frame angles between arrays.

GROUNDSTACKED 500-HP SUBWOOFERS WITH MINAS

The MTF-M'elodie/MINA transition frame can be used to stack up to six MINA loudspeakers on top of a 500-HP subwoofer. The 500-HP attaches to the transition frame's outer links and is secured with the 500-HP's quick-release pins. The 500-HP attaches to the transition frame at an angle of 0 degrees. The transition frame attaches to the bottom MINA's GuideALinks and is secured with the transition frame's inner quick-release pins. The position of the MINA's rear GuideALinks determines the angle of the MINA, which can be from +6 to -5 degrees.



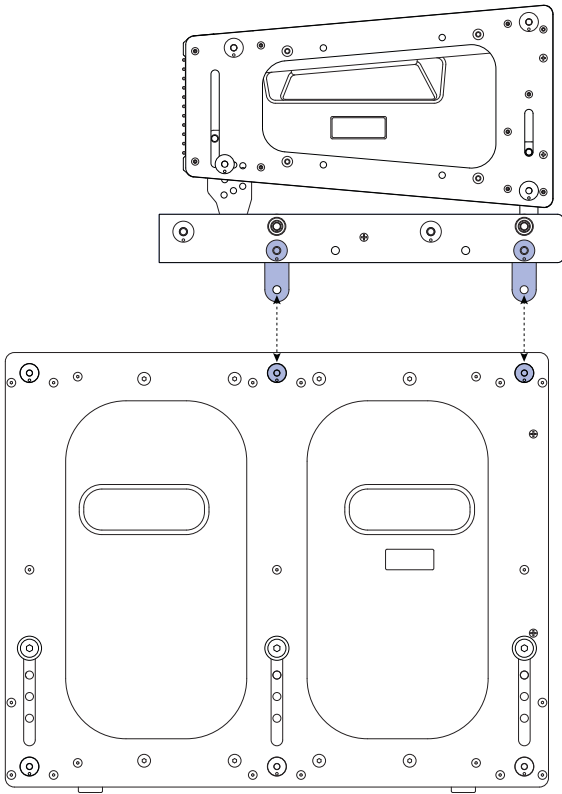
MTF-M'elodie/MINA Transition Frame, Groundstacked 500-HP Subwoofers with Stacked MINAs

CAUTION: Make sure to use the appropriate quick-release pins when securing the 500-HP subwoofer and MINA loudspeaker to the transition frame. Use the red 5/16" x 0.875" quick-release pins in the outer frame to secure the 500-HP. Use the black 1/4" x 0.90" quick-release pins in the inner frame to secure the MINA.

NOTE: The MTF-M'elodie/MINA transition frame can only be used with 500-HP subwoofers equipped with the optional rigging frames.

Groundstacked 500-HP Subwoofers with MINAs: Angle for Transition Frame

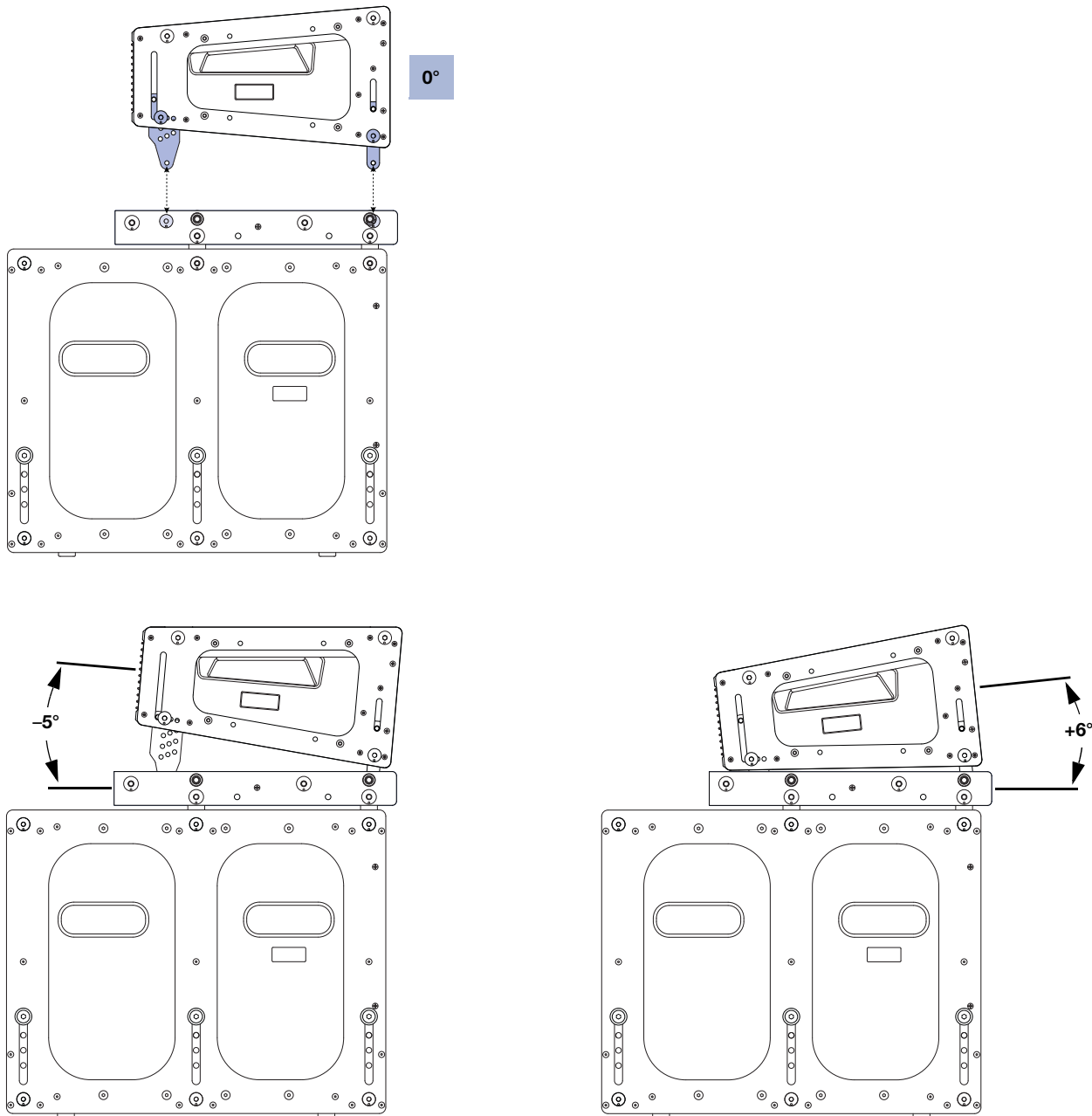
When groundstacking 500-HP subwoofers with MINA loudspeakers, the 500-HP attaches to the transition frame at an angle of 0 degrees.



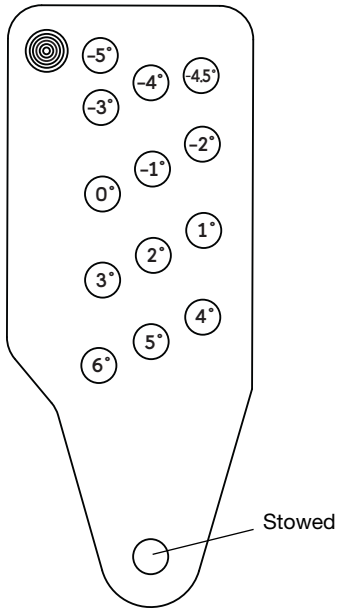
500-HP Attached to Transition Frame at 0 Degrees

Groundstacked 500-HP Subwoofers with MINAs: Angle for Bottom MINA

When groundstacking 500-HP subwoofers with MINA loudspeakers, the bottom MINA can be attached to the transition frame at angles from +6 to -5 degrees. The position of the MINA's rear GuideALinks determines the angle for the MINA.



Groundstacked 500-HP Subwoofers with MINAs: MINA Angles



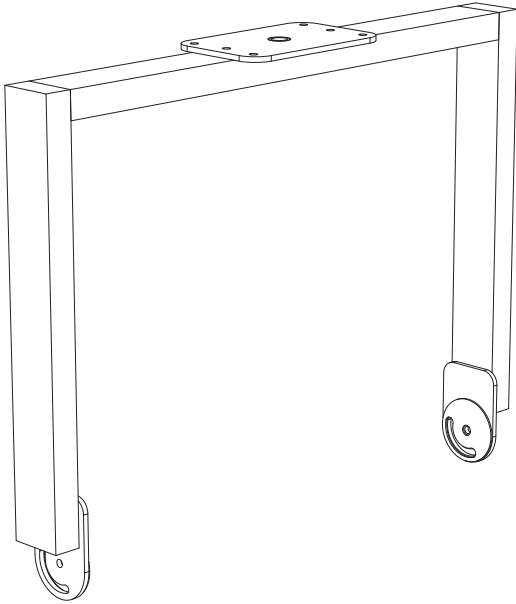
MINA Rear GuideALink Positions

MINA GuideALink Positions for MINA Angles

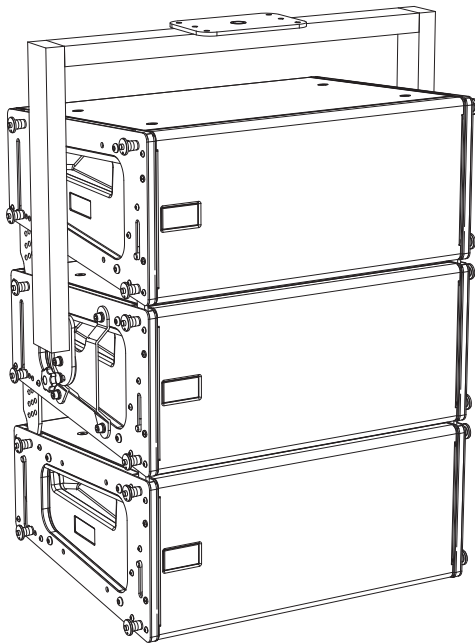
Rear GuideALink Label Position	Actual Groundstack Angle
0	-5°
0.5	-4.5°
1	-4°
2	-3°
3	-2°
4	-1°
5	0°
6	+1°
7	+2°
8	+3°
9	+4°
10	+5°
11	+6°

CHAPTER 7: MYA-MINA MOUNTING YOKE

The MYA-MINA mounting yoke flies up to three MINA loudspeakers from a single hanging point, or pole-mounts up to two MINA loudspeakers with a third-party pole-mount adapter. The yoke includes two bracketing options: the MPA-2 bracket for attaching to two cabinets, and the MPA-3 bracket for attaching to one or three cabinets. For larger arrays, the MG-MINA grid is recommended (see Chapter 3, “MG-MINA Grid”); for smaller profile applications, the MUB-MINA U-bracket is recommended (see Chapter 8, “MUB-MINA U-Bracket”).



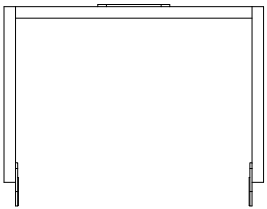
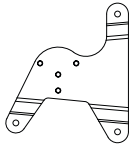
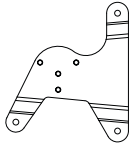
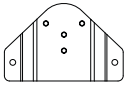
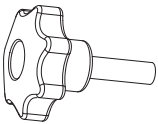
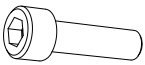


MYA-MINA Mounting Yoke



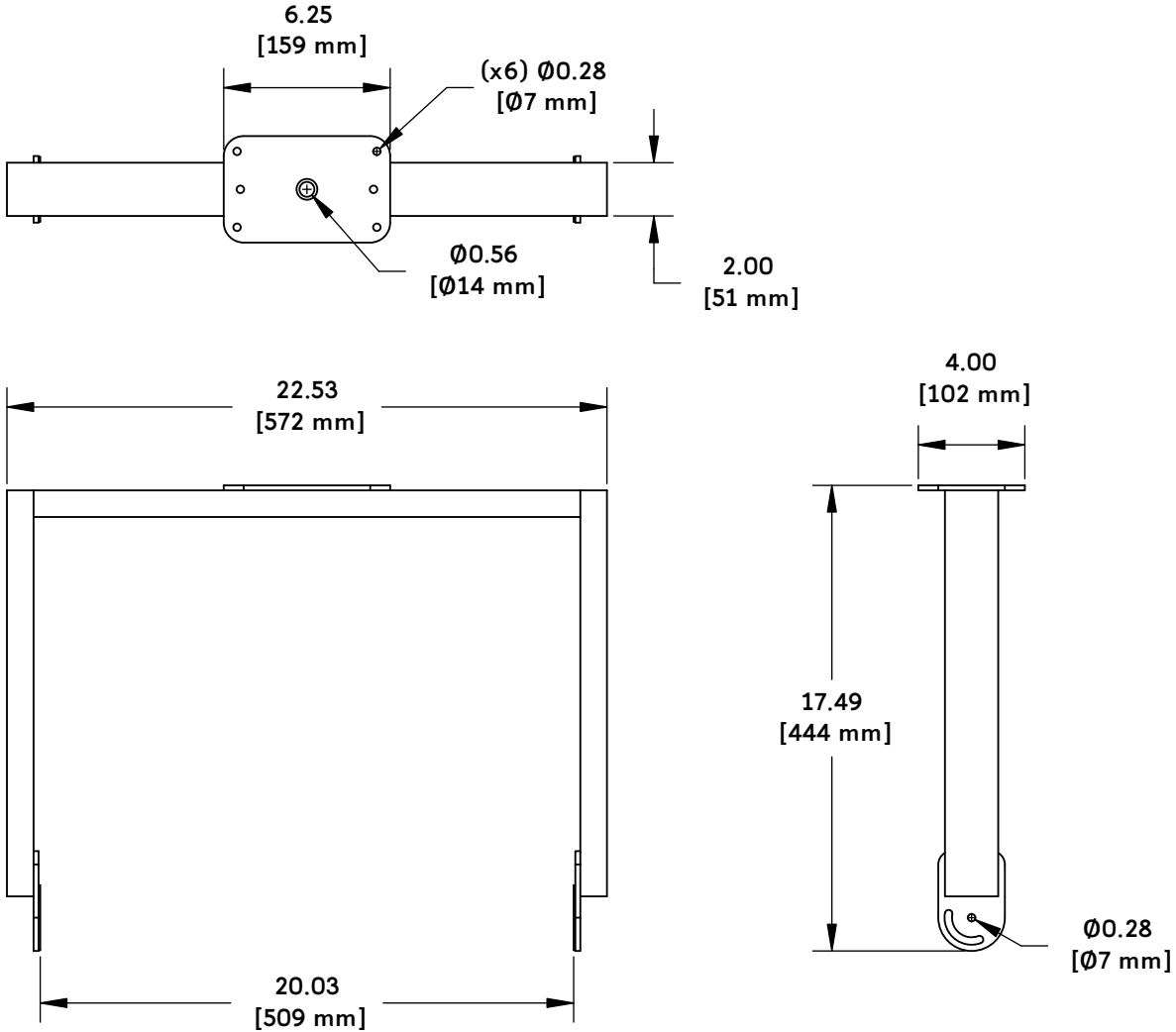
MYA-MINA Mounting Yoke with Three MINA Loudspeakers

MYA-MINA Kit Contents

PN 40.207.104.01

	Part Number	Quantity	Description
	45.207.135.01	1	MYA-MINA yoke assembly
	64.207.155.01	1	Bracket (right) for one or three cabinets
	64.207.156.01	1	Bracket (left) for one or three cabinets
	64.207.157.01	2	Bracket for two cabinets
	124.115	2	Knobs, M6 x 1 x 20 mm
	101.840	14	Screws, M6 x 1 x 22 mm
	113.521	14	Flat washers, M6
	115.531	14	Lock washers, M6

MYA-MINA Dimensions

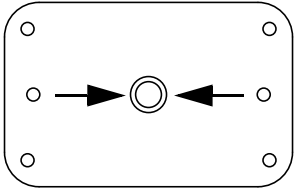
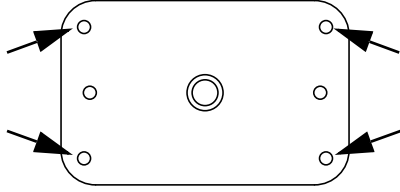


MYA-MINA Weight: 12.9 lbs (5.85 kg)

MYA-MINA LOAD RATINGS

An array of up to three MINA loudspeakers can be flown with the MYA-MINA mounting yoke at a 7:1 safety factor. When flying any number of MINAs with the yoke, the yoke must be secured to the mounting surface with the 1/2-inch center hole.

Table 5: MYA-MINA Load Ratings

Mounting Point	Safety Factor	Number of Flown MINAs	MYA-MINA Yoke Mounting Plate
1/2" center hole	7:1	Three MINAs (123.6 lbs, 56.06 kg)	
Four 1/4" corner holes	NA	Not rated for flown applications; these holes should only be used to attach the yoke to a pole-mount adapter; a maximum of two MINAs can be pole-mounted.	 <p>Not rated for flown applications</p>



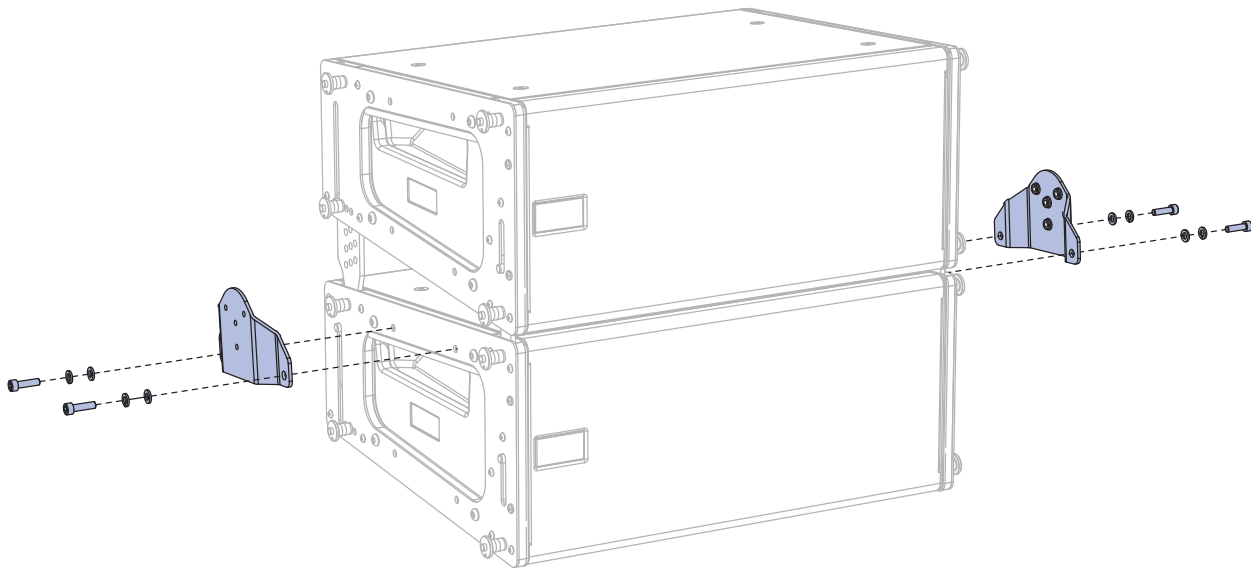
CAUTION: When mounting the MYA-MINA on a pole, make sure the pole and pole-mount adapter have been rated to support the full weight of the yoke and two loudspeakers. Observe all safety precautions specified by the pole and pole-mount adapter manufacturer.

MYA-MINA BRACKET OPTIONS

The MYA-MINA mounting yoke includes two side bracketing options: the MPA-2 for attaching to two cabinets, and the MPA-3 for attaching to one or three cabinets. The bracket options allow the yoke to attach near the center of gravity for the loudspeakers. The brackets bolt directly to the MINA end frames with the M6 bolts and washers included with the yoke kit; for attaching to the yoke, the brackets include a center/pivot hole and three pinning holes to yield a wide range of uptilt and downtilt angles for the loudspeakers.

MPA-2 Bracket

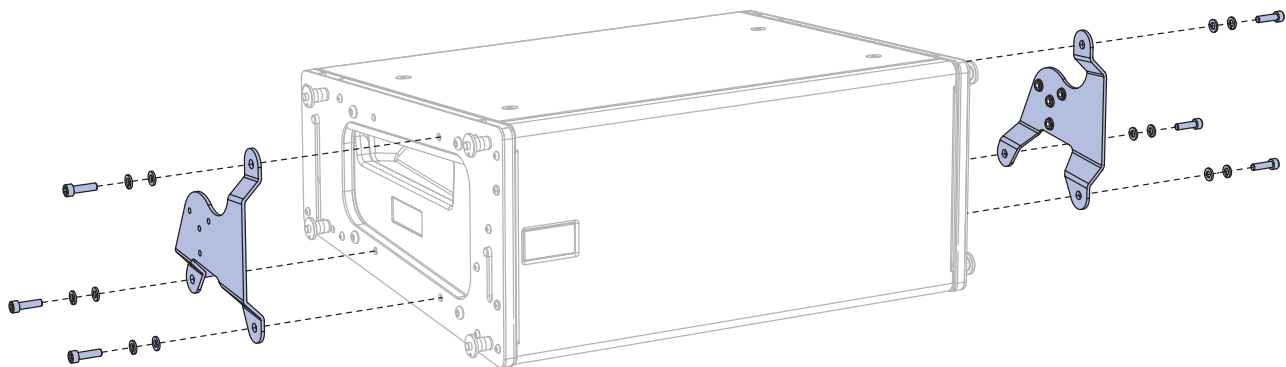
When suspending two MINA cabinets with the MYA-MINA mounting yoke, use the MPA-2 bracket and attach it to the bottom cabinet.



MPA-2 Bracket

MPA-3 Bracket

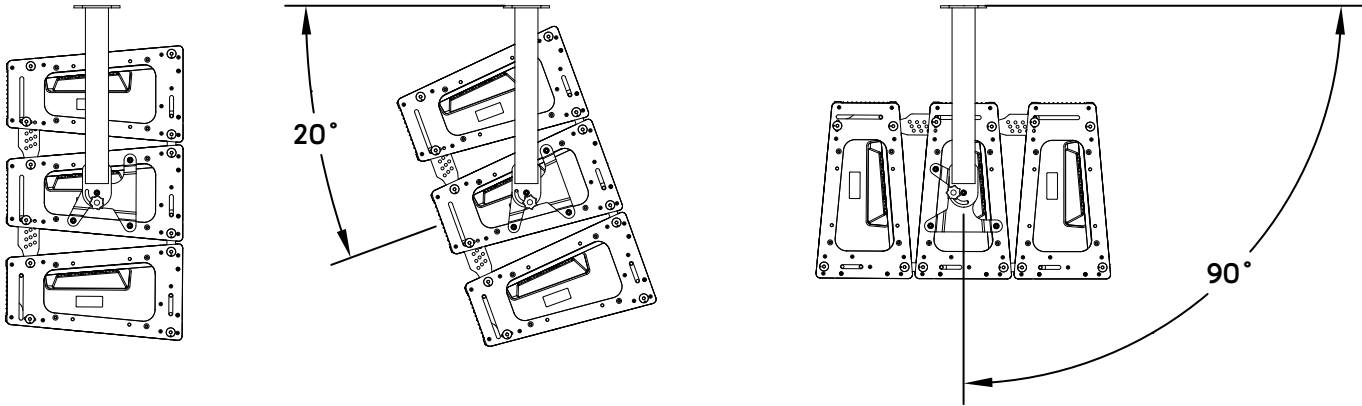
When suspending one or three MINA cabinets with the MYA-MINA mounting yoke, use the MPA-3 bracket. When suspending three cabinets, attach the bracket to the center cabinet (see Figure 2 on page 48).



MPA-3 Bracket

MYA-MINA FLOWN CONFIGURATIONS

The MYA-MINA mounting yoke flies up to three MINA loudspeakers from a single hanging point. The yoke attaches to the side brackets (which attach directly to the MINA end frames) and is secured with the included M6 screws in the center, pivot holes, and the M6 knobs in one of three pinning holes. For flown applications, the yoke supports up to 20 degrees of up tilt and severe downtilts of 90 degrees or more.



Flown Configurations for MYA-MINA with Three MINAs

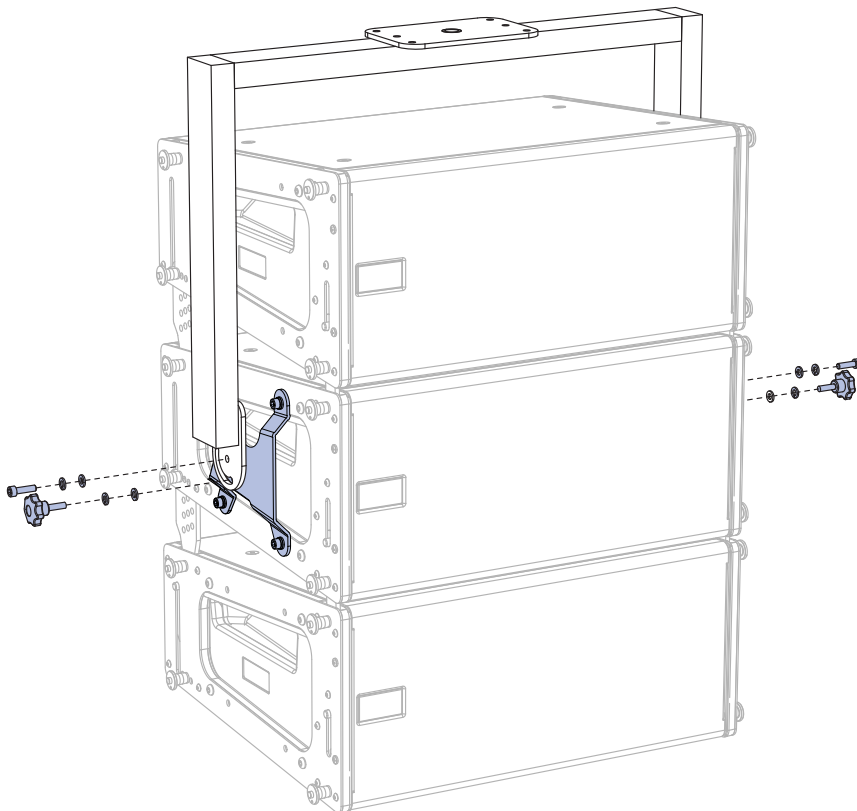



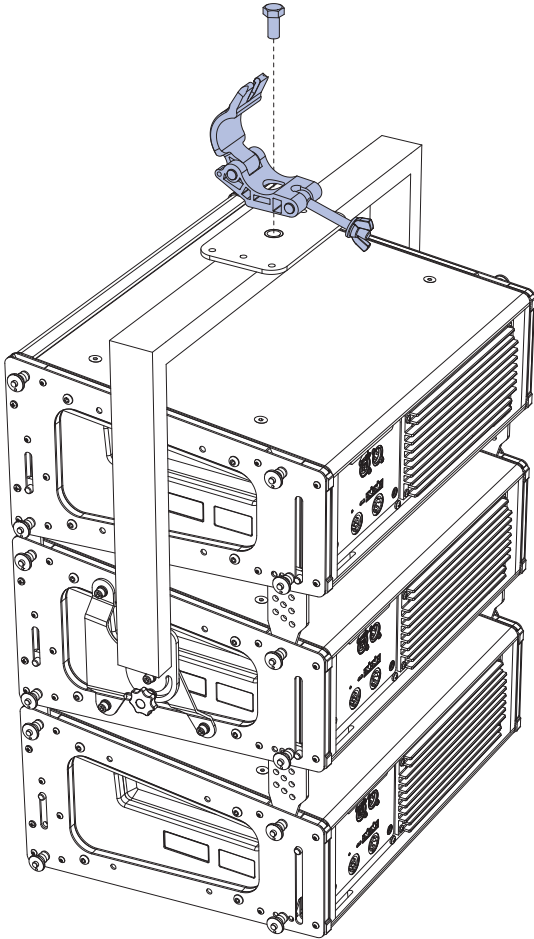
Figure 2: Flown MYA-MINA with MPA-3 Adapter and Three MINAs



CAUTION: The MYA-MINA mounting bracket at the top of yoke has one 1/2-inch center hole and four smaller corner holes. Only the center hole is rated for flown applications. The four corner holes are used for attaching to pole-mount adapters. For information load ratings, see Table 5 on page 46.

 **TIP:** The M6 screws can be used in the pinning holes for fixed installations that will not require tilt adjustments for the loudspeakers. For installations that *will* require tilt adjustments, use the M6 knobs in the pinning holes, as they are more easily untightened and tightened.

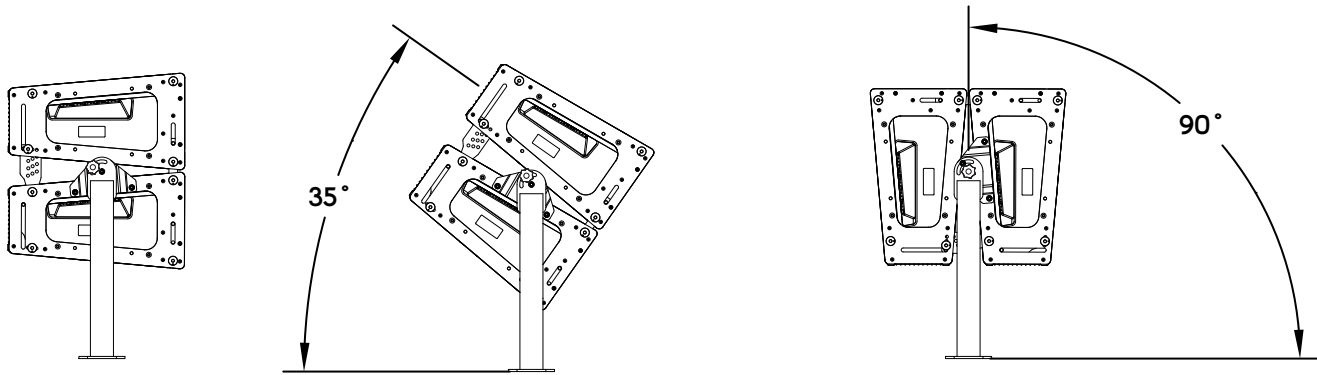
The MYA-MINA mounting yoke can be suspended with a standard 1/2-inch C-clamp or half Cheesborough clamp (not included). Make sure the clamp is rated to support the full weight of the yoke and flown loudspeakers.



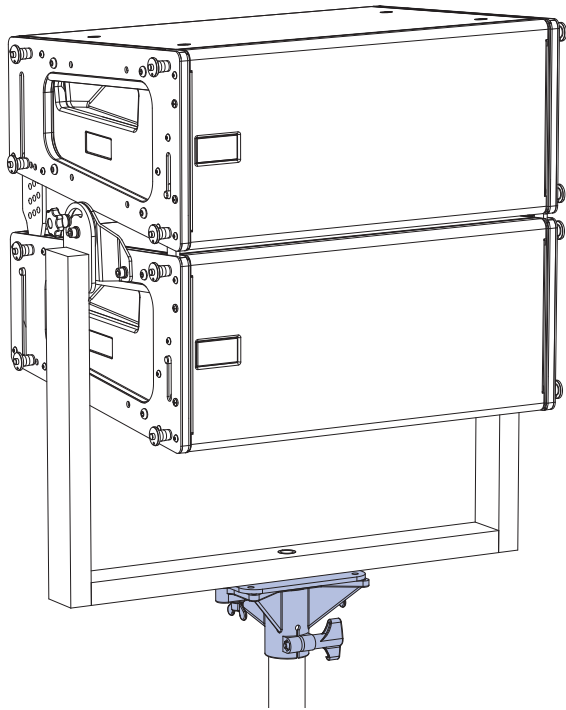
Flown MYA-MINA with Half Cheesborough Clamp

MYA-MINA POLE-MOUNT CONFIGURATIONS

Up to two MINA loudspeakers can be pole-mounted with the MYA-MINA mounting yoke. The yoke attaches to the side brackets (which attach directly to the MINA end frames) and is secured with the included M6 screws in the center, pivot holes, and the M6 knobs in one of three pinning holes. For pole-mount applications, the yoke supports up to 35 degrees of downtilt and severe uptilts of 90 degrees or more. When pole-mounting MINAs with the yoke, a third-party pole-mount adapter is required.



Pole-Mount Configurations for MYA-MINA with Two MINAs



MYA-MINA with Pole-Mount Adapter



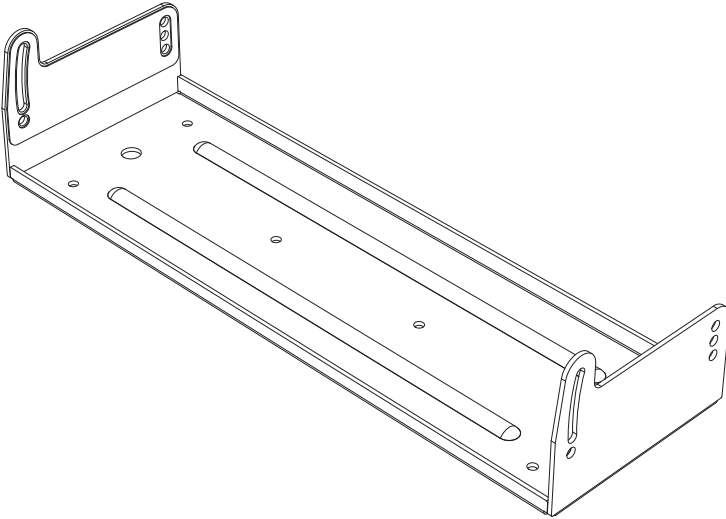
CAUTION: When mounting the MYA-MINA on a pole, make sure the pole and pole-mount adapter have been rated to support the full weight of the yoke and two loudspeakers. Observe all safety precautions specified by the pole and pole-mount adapter manufacturer.



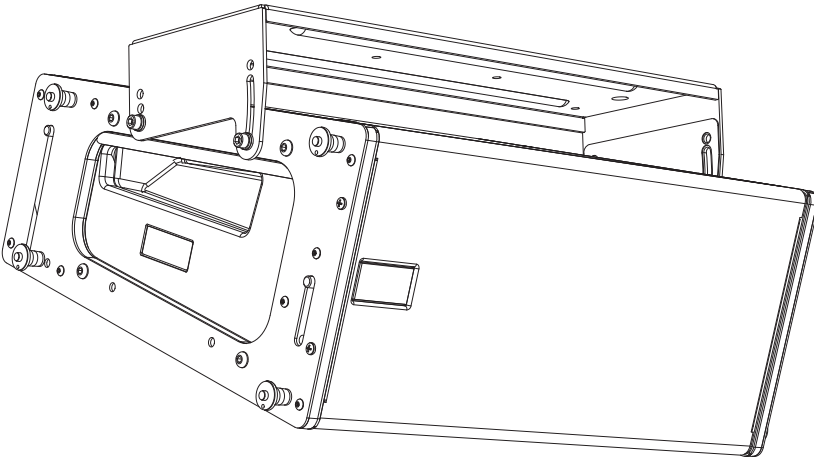
TIP: The M6 screws can be used in the pinning holes for fixed installations that will not require tilt adjustments for the loudspeakers. For installations that *will* require tilt adjustments, use the M6 knobs in the pinning holes, as they are more easily untightened and tightened.

CHAPTER 8: MUB-MINA U-BRACKET

The MUB-MINA U-bracket was primarily designed for aiming a single MINA loudspeaker in floor- and ceiling-mount configurations. However, the U-bracket is strong enough to fly arrays of up to three cabinets, or stack up to two cabinets in floor- and pole-mount configurations. The U-bracket can also be flown from trusses using C-clamps or equivalent. For flying and groundstacking larger arrays, the MG-MINA grid is recommended (see Chapter 3, “MG-MINA Grid”); for applications requiring continuous adjustability or greater downtilt and uptilt angles, the MYA-MINA mounting yoke is recommended (see Chapter 7, “MYA-MINA Mounting Yoke”).



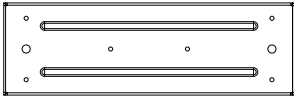
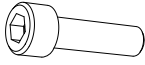


MUB-MINA U-Bracket



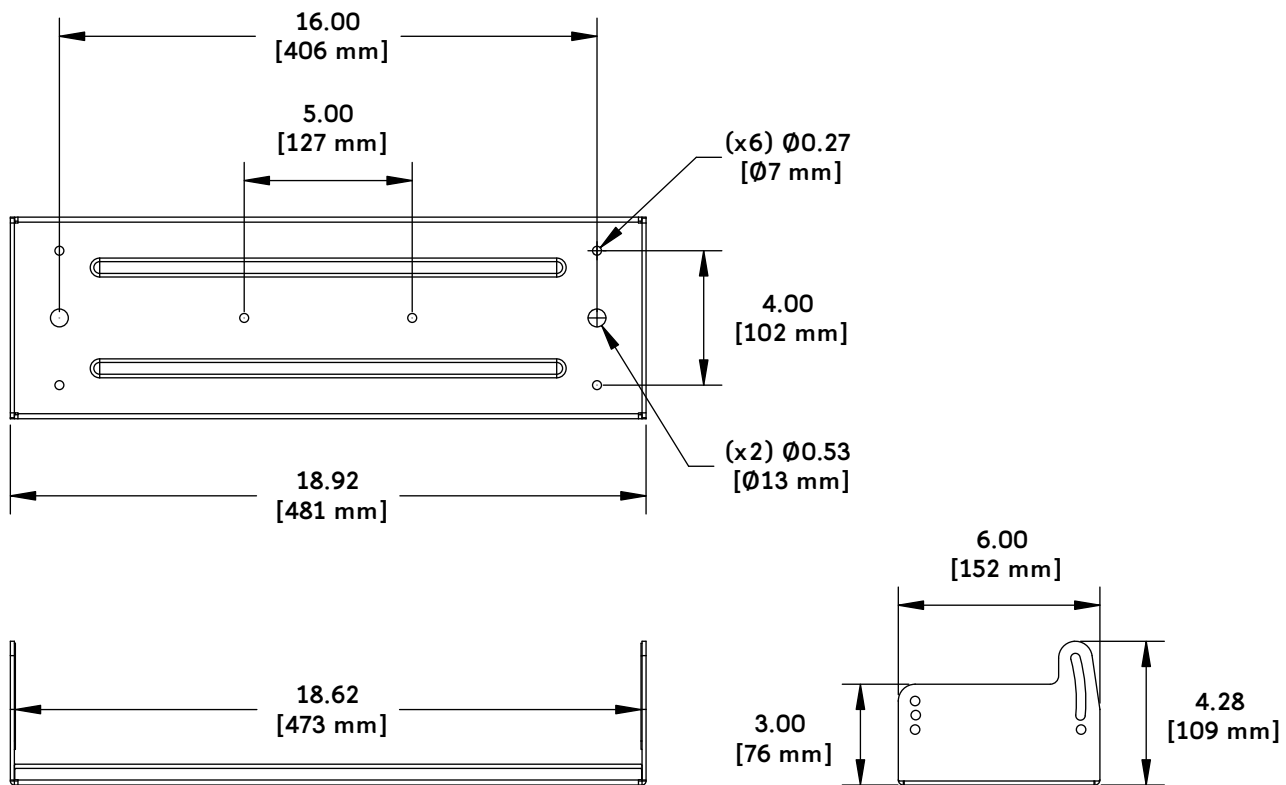
MUB-MINA U-Bracket with One MINA Loudspeaker

MUB-MINA Kit Contents

PN 40.207.030.01

	Part Number	Quantity	Description
	45.207.030.01	1	MUB-MINA U-bracket
	101.840	4	Screws, M6 x 1 x 22 mm
	113.521	4	Flat washers, M6
	115.531	4	Lock washers, M6

MUB-MINA Dimensions

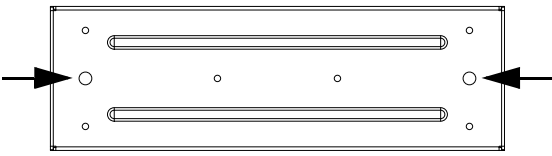
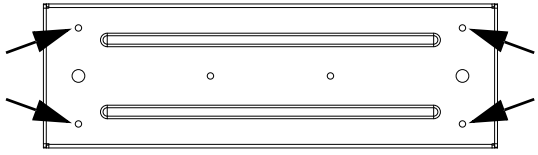
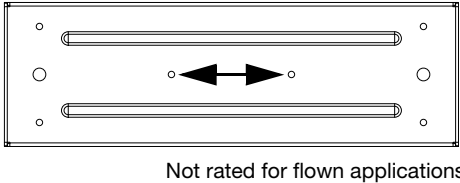



MUB-MINA Weight: 5.8 lbs (2.63 kg)

MUB-MINA LOAD RATINGS

An array of up to three MINA loudspeakers can be flown with the MUB-MINA U-bracket at a 7:1 safety factor. When flying any number of MINAs with the U-bracket, the U-bracket must be secured to the mounting surface with either the two 1/2-inch center holes or the four 1/4-inch corner holes.

Table 6: MUB-MINA Load Ratings

Mounting Point	Safety Factor	Number of Flown MINAs	MUB-MINA Mounting Points
Two 1/2" center holes	7:1	Three MINAs (123.6 lbs, 56.06 kg) with the load evenly distributed on the two points	
Four 1/4" corner holes	7:1	Three MINAs (123.6 lbs, 56.06 kg) with the load evenly distributed on the four points	
Two 1/4" center holes	NA	Not rated for flown applications; these holes should only be used to attach the U-bracket to a pole-mount adapter.	

 **CAUTION:** When mounting the MUB-MINA on a pole, make sure the pole and pole-mount adapter have been rated to support the full weight of the U-bracket and loudspeakers. Observe all safety precautions specified by the pole and pole-mount adapter manufacturer.

MUB-MINA ANGLE SETTINGS

To allow for a range of angles for the attached MINA, one end of the MUB-MINA U-bracket has three fixed holes and the other end has a single fixed hole and slot. The U-bracket's holes and slots align with MINA's attachment points (two per side). The screws and washers included with the MUB-MINA kit secure the U-bracket to the MINA cabinet. Tables 7–10 on the following pages show the available angles for both flown and floor- and pole-mount configurations for the MUB-MINA.

- When using the MUB-MINA U-bracket for flown configurations, the U-bracket can be oriented for either maximum downtilt (with the slot near the front of the loudspeakers) or maximum uptilt (with the slot near the rear of the loudspeakers).
- When using the MUB-MINA U-bracket for floor- and pole-mounted configurations, the U-bracket can be oriented for either maximum downtilt (with the slot near the rear of the loudspeakers) or maximum uptilt (with the slot near the front of the loudspeakers).

Table 7: MUB-MINA Flown, Fixed Angles

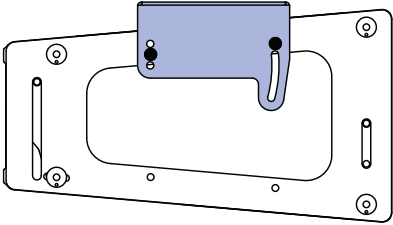
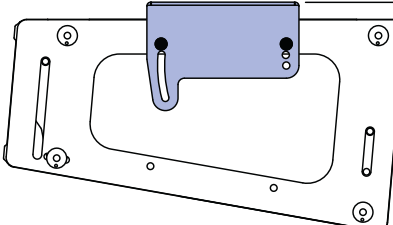
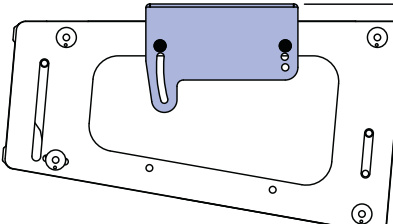
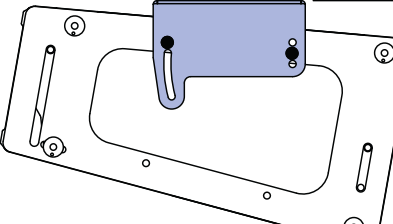
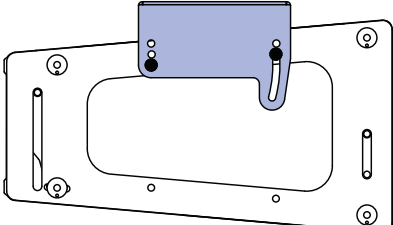
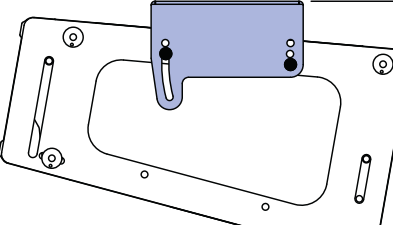
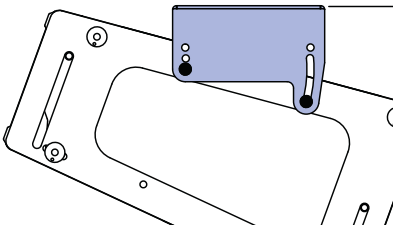
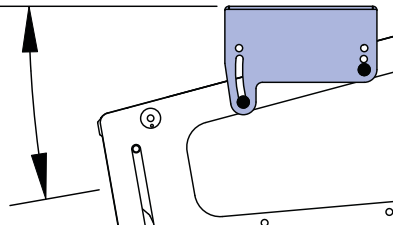
Flown, Maximum Downtilt Fixed (0°, -5°)	Flown, Maximum Uptilt Fixed (-5°, -10°)
 <p>0°</p>	 <p>-5°</p>
 <p>-5°</p>	 <p>-10°</p>

Table 8: MUB-MINA Flown, Adjustable Angles

Flown, Maximum Downtilt Adjustable (0° to 20°)	Flown, Maximum Uptilt Adjustable (-10° to +10°)
 <p>0°</p>	 <p>-10°</p>
 <p>-20°</p>	 <p>+10°</p>



NOTE: For multiple flown cabinets, the MUB-MINA slot is not recommended for variable adjustments since the angle could change over time due to the weight of the cabinets.

Table 9: MUB-MINA Floor/Pole-Mount, Fixed Angles

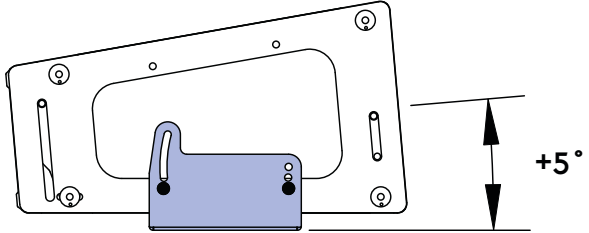
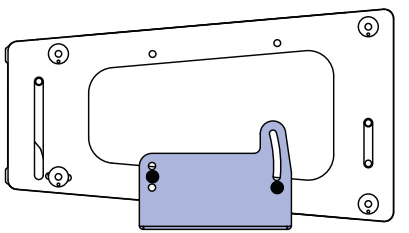
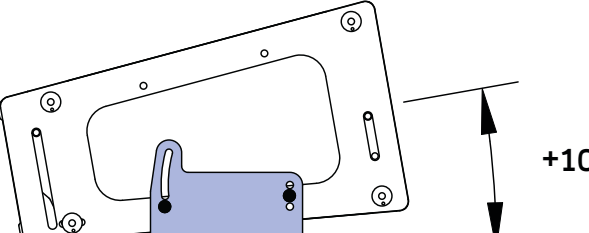
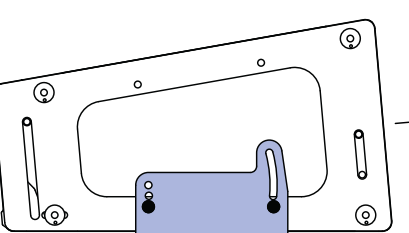
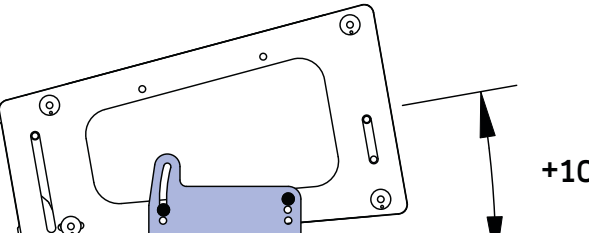
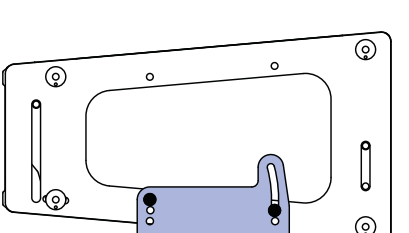
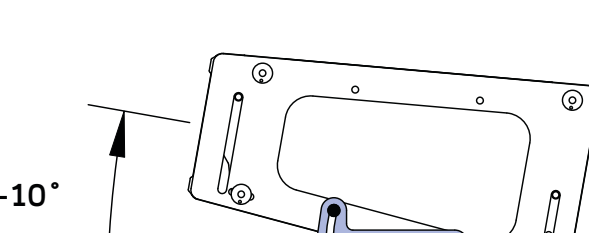
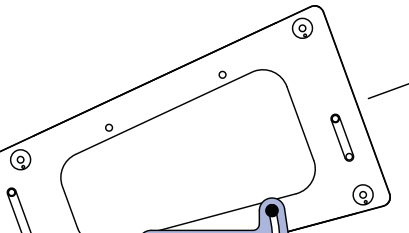
Flown/Pole-Mount, Maximum Downtilt Fixed (+5°, +10°)	Floor/Pole-Mount, Maximum Uptilt Fixed (0°, +5°)
 <p>+5°</p>	 <p>0°</p>
 <p>+10°</p>	 <p>+5°</p>

Table 10: MUB-MINA Floor/Pole-Mount, Adjustable Angles

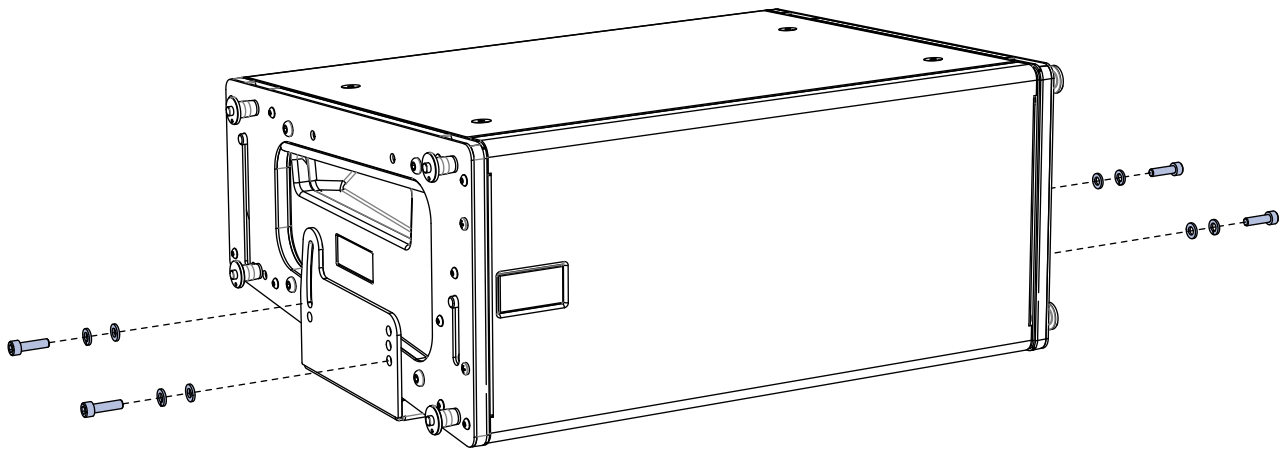
Floor/Pole-Mount, Maximum Downtilt Adjustable (+10° to -10°)	Floor/Pole-Mount, Maximum Uptilt Adjustable (0° to +20°)
 <p>+10°</p>	 <p>0°</p>
 <p>-10°</p>	 <p>+20°</p>

MUB-MINA FLOOR-MOUNT CONFIGURATIONS

The MUB-MINA U-bracket can be mounted to a floor to aim a single MINA loudspeaker, or it can be used for stacking up to two MINA loudspeakers. The MUB-MINA U-bracket should be secured to the floor with fasteners placed in its four corner holes. Make sure to use fasteners appropriate for the floor surface. The MINA cabinet is secured to the U-bracket with the screws and washers included with the MUB-MINA kit. A second MINA cabinet can be stacked on top of the first cabinet and secured with the top unit's GuideALinks.

For floor-mounted configurations, the MUB-MINA can be oriented for either maximum downtilt (with the slot near the rear of the loudspeakers) or maximum uptilt (with the slot near the front of the loudspeakers).

- For a single floor-mounted cabinet, the MUB-MINA supports continuous angles from +10 to -10 degrees in the maximum downtilt orientation, and continuous angles from 0 to +20 degrees in the maximum uptilt orientation.
- For two floor-mounted cabinets, the MUB-MINA supports fixed angles of 0, +5, and +10 degrees with either orientation.



Floor-Mounted MUB-MINA with One MINA



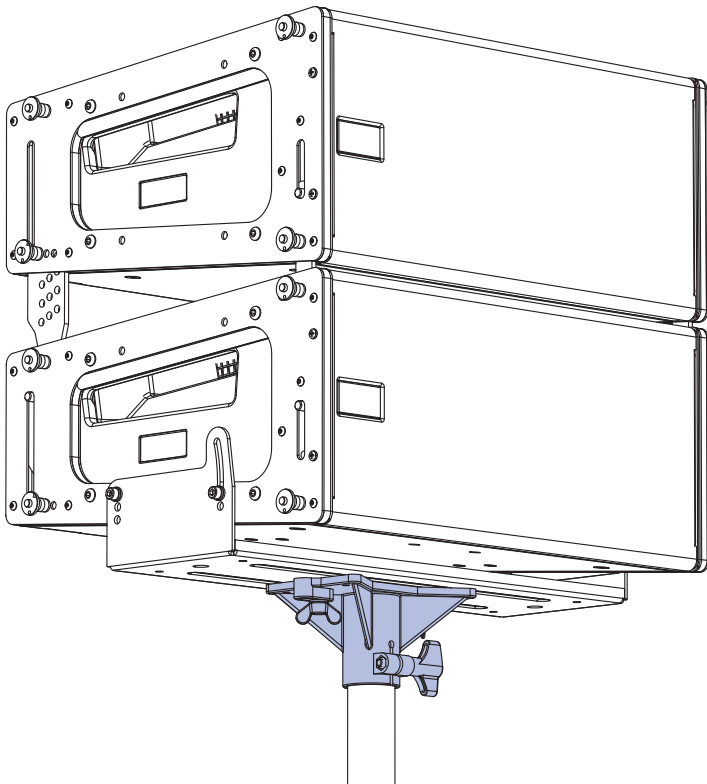
NOTE: For illustrations showing which MUB-MINA mounting holes and slot configurations to use to achieve specific angles for floor-mount applications, see Table 9 and Table 10 on page 55.

MUB-MINA POLE-MOUNT CONFIGURATIONS

Up to two MINA loudspeakers can be pole-mounted with the MUB-MINA U-bracket. The MUB-MINA U-bracket should be secured to the pole-mount adapter with fasteners placed in the U-bracket's two center holes. The MINA cabinet is secured to the U-bracket with the screws and washers included with the MUB-MINA kit. A second MINA cabinet can be stacked on top of the first cabinet and secured with the top unit's GuideALinks.

For pole-mounted configurations, the MUB-MINA can be oriented for either maximum downtilt (with the slot near the rear of the loudspeakers) or maximum uptilt (with the slot near the front of the loudspeakers).

- For a single pole-mounted cabinet, the MUB-MINA supports continuous angles from +10 to -10 degrees in the maximum downtilt orientation, and angles from 0 to +20 degrees in the maximum uptilt orientation.
- For two pole-mounted cabinets, the MUB-MINA supports fixed angles of 0, +5, and +10 degrees with either orientation.



Pole-Mounted MUB-MINA with Two MINAs



CAUTION: When mounting the MUB-MINA on a pole, make sure the pole and pole-mount adapter have been rated to support the full weight of the U-bracket and loudspeakers. Observe all safety precautions specified by the pole and pole-mount adapter manufacturer.



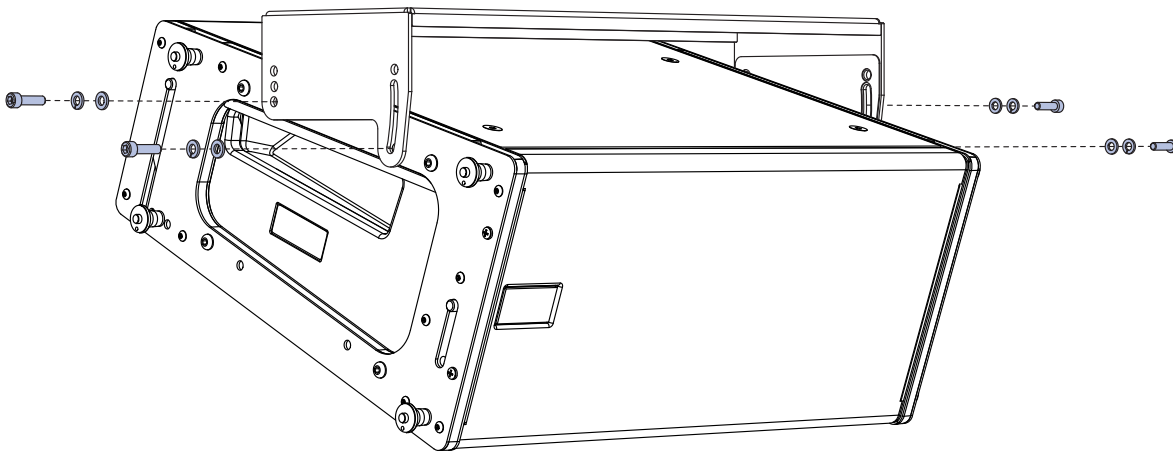
NOTE: For illustrations showing which MUB-MINA mounting holes and slot configurations to use to achieve specific angles for pole-mount applications, see Table 9 and Table 10 on page 55.

MUB-MINA CEILING-MOUNT CONFIGURATIONS

The MUB-MINA U-bracket can be mounted to a ceiling to aim a single MINA loudspeaker, or it can be used for flying arrays of up to three MINA loudspeakers. The MUB-MINA U-bracket should be secured to the ceiling with fasteners placed in its four corner holes. Make sure to use fasteners appropriate for the ceiling surface and rated to meet or exceed the weight of the MUB-MINA and flown loudspeakers. The MINA cabinet is secured to the U-bracket with the screws and washers included with the MUB-MINA kit. Additional cabinets are attached to the top cabinet with the top unit's GuideALinks.

For ceiling-mounted configurations, the MUB-MINA can be oriented for either maximum downtilt (with the slot near the front of the loudspeakers) or maximum uptilt (with the slot near the rear of the loudspeakers).

- For a single flown cabinet, the MUB-MINA supports continuous angles of 0 to -20 degrees in the maximum downtilt orientation, and angles of $+10$ to -10 degrees in the maximum uptilt orientation.
- For multiple flown cabinets, the MUB-MINA supports fixed angles of $+10$, 0 , -5 , -10 , and -20 degrees with either orientation.



Ceiling-Mounted MUB-MINA with One MINA



NOTE: For multiple flown cabinets, the MUB-MINA slot is not recommended for variable adjustments since the angle could change over time due to the weight of the cabinets.



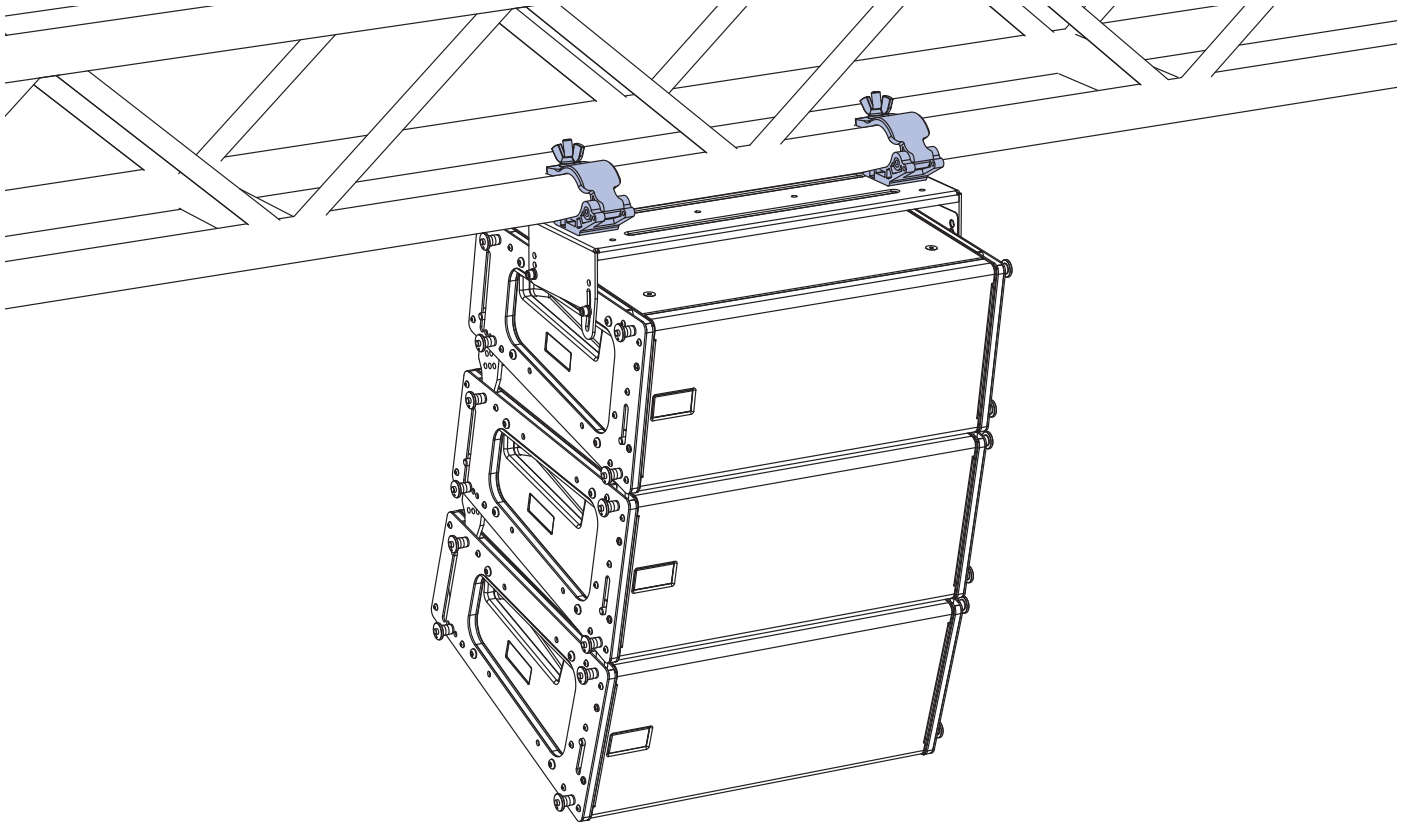
NOTE: For illustrations showing which MUB-MINA mounting holes and slot configurations to use to achieve specific angles for ceiling-mount applications, see Table 7 and Table 8 on page 54.

MUB-MINA FLOWN CONFIGURATIONS

The MUB-MINA U-bracket can be flown from a truss with two C-clamps attached to the bracket's two 1/2-inch center holes, or the U-bracket can be suspended with four eyebolts attached to the U-bracket's four 1/4-inch corner holes. Make sure to use rigging hardware rated to meet or exceed the weight of the U-bracket and suspended loudspeakers.

For flown configurations, the MUB-MINA can be oriented for either maximum downtilt (with the slot near the front of the loudspeakers) or maximum uptilt (with the slot near the rear of the loudspeakers).

- For a single flown cabinet, the MUB-MINA supports continuous angles of 0 to -20 degrees in the maximum downtilt orientation, and angles of $+10$ to -10 degrees in the maximum uptilt orientation.
- For multiple flown cabinets, the MUB-MINA supports fixed angles of $+10$, 0 , -5 , -10 , and -20 degrees with either orientation.



Flown MUB-MINA with Three MINAs



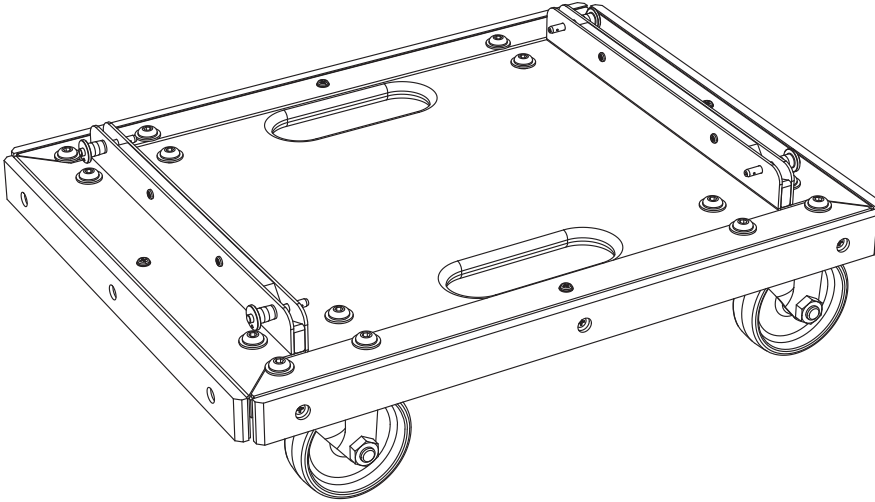
NOTE: For multiple flown cabinets, the MUB-MINA slot is not recommended for variable adjustments since the angle could change over time due to the weight of the cabinets.



NOTE: For illustrations showing which MUB-MINA mounting holes and slot configurations to use to achieve specific angles for flown applications, see Table 7 and Table 8 on page 54.


CHAPTER 9: THE MCF-MINA CASTER FRAME

The MCF-MINA caster frame safely supports up to five MINAs for transport and groundstacking, making it easy to assemble or disassemble arrays. The caster frame's sturdy construction allows it be conveniently moved with forklifts.



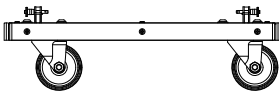
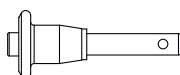
MCF-MINA Caster Frame

The MINA at the bottom of the stack attaches securely to the caster frame with its GuideALinks and is secured with the four (1/4 by 0.90-inch) quick-release pins included with the caster frame. The configuration of the GuideALinks for the attached MINA determines its tilt, which can be from +6 degrees (uptilt) to -5 degrees (downtilt).

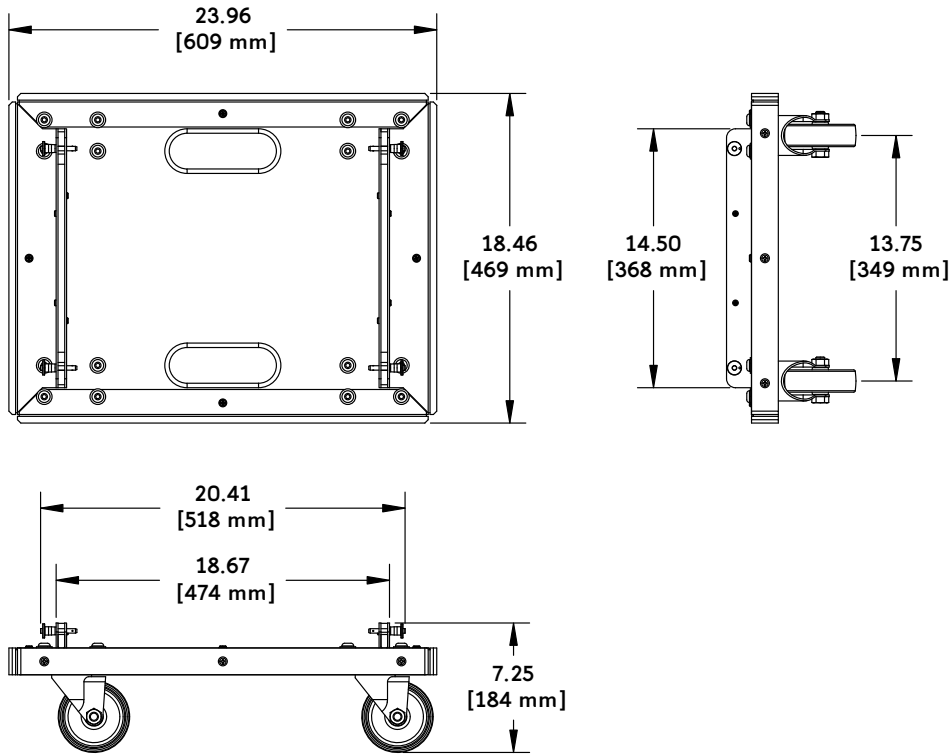
 **CAUTION:** Always use the quick-release pins included with the MCF-MINA caster frame to secure ground-stacked MINAs to the grid. Do not use the quick-release pins included with MINA in the frame as they are shorter and will not lock in place.

MCF-MINA Kit Contents

PN 40.207.102.01

	Part Number	Quantity	Description
	45.207.126.01	1	MCF-MINA caster frame
	134.036	4	1/4" x 0.90" quick-release pins

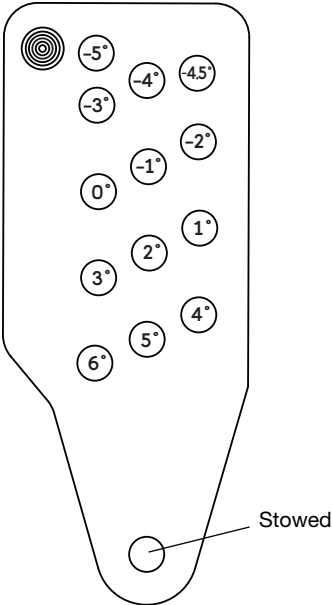
MCF-MINA Dimensions



MCF-MINA Caster Frame Dimensions

MCF-MINA Weight: 28.0 lbs (12.7 kg)

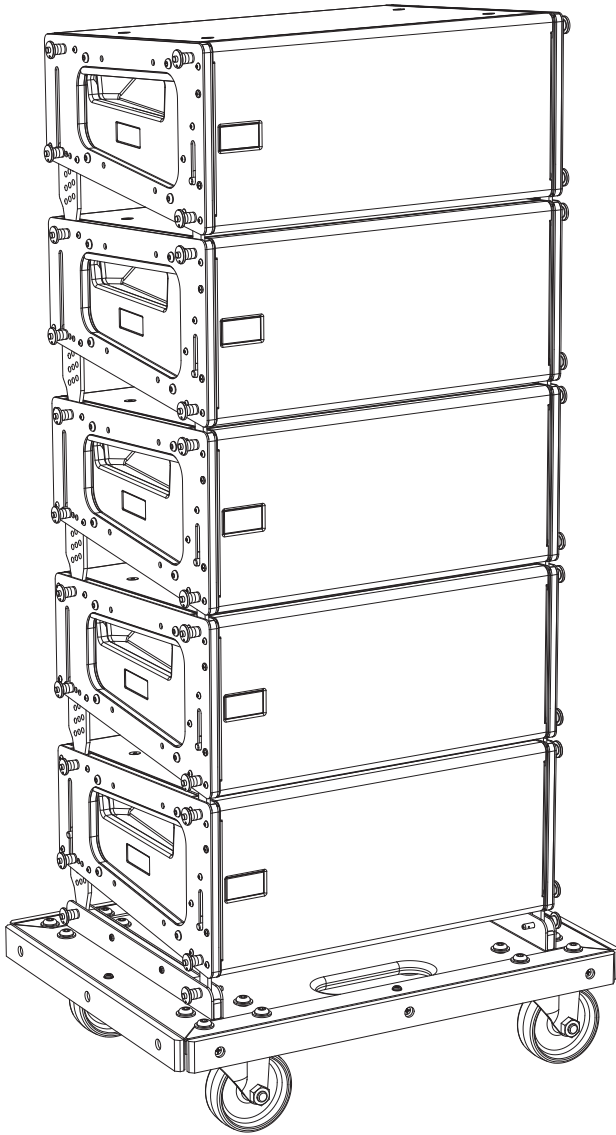
MCF-MINA Angles



MINA Rear GuideALink Angles for Groundstacked Units

Table 11: MCF-MINA Groundstack Angles

Rear GuideALink Label Position	Actual Groundstack Angle
0	-5°
0.5	-4.5°
1	-4°
2	-3°
3	-2°
4	-1°
5	0°
6	+1°
7	+2°
8	+3°
9	+4°
10	+5°
11	+6°



MCF-MINA Caster Frame with MINA Stack



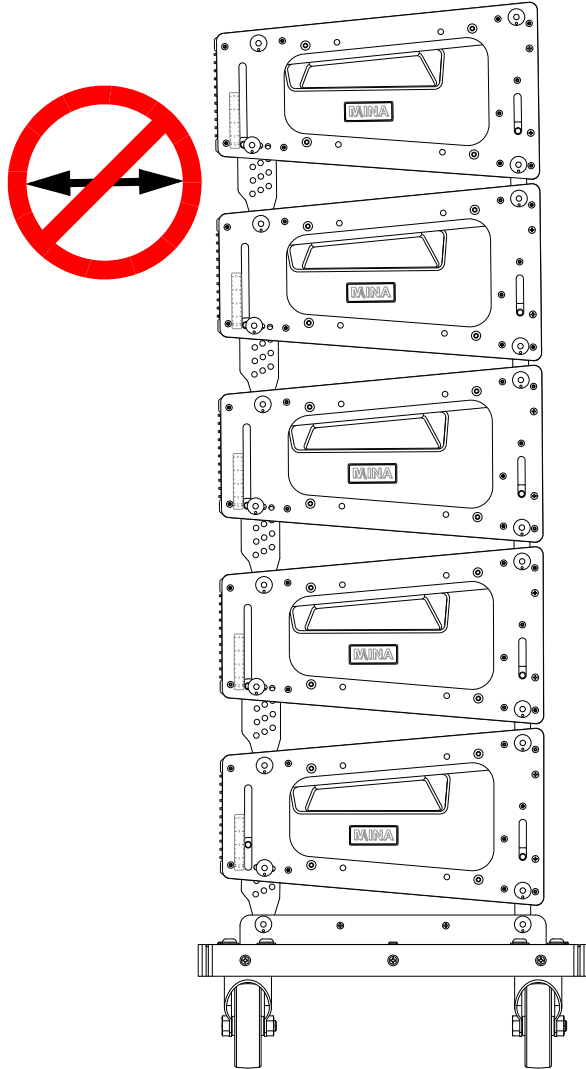
TIP: The MG-MINA grid can travel installed on top of MINA stacks.




TIP: Durable nylon covers, sized for stacks of 3, 4, and 5 units, are available to ensure the MINA is completely road ready.

SAFETY GUIDELINES FOR THE MCF-MINA CASTER FRAME

- Do not stack more than five MINAs.
- Avoid moving stacks in the front-to-back direction of the MINAs (the long side); always move stacks sideways to avoid tipping.



- When transporting a non-curved MINA stack with 0-degree splay angles, configure the rear GuideALinks for the bottom MINA so it is attached to the caster frame at 0 degrees (using the 5-degree hole in the MINA GuideALinks).
- When transporting a curved MINA stack with wide splay angles, configure the rear GuideALinks for the bottom MINA so it is attached to the caster frame at -5 degrees (using the 0-degree hole in the MINA GuideALinks), to compensate for the stack's center of gravity.
- When groundstacking MINAs with the caster frame, make sure that all four caster wheels are blocked to prevent the stack from rolling away.

 **CAUTION:** MINA stacks with severe angles between loudspeakers are less stable. When possible, to avoid tipping, transport stacks with MINAs as close as possible to 0 degrees with respect to the caster frame.

APPENDIX A: ASSEMBLING MINA ARRAYS WITH THE MG-MINA GRID

To assemble a MINA array with the MG-MINA grid:

1. Place the MG-MINA grid on the floor or road trunk in the approximate location where the rigging points have been established and the motors have been hung. Orient the grid for the desired configuration:
 - **Maximum Downtilt:** Use this option to place the flown MINAs closer to the front of the grid, to achieve a few more degrees of downtilt.
 - **Maximum Uptilt:** Use this option to place the flown MINAs closer to the rear of the grid, to achieve a few more degrees of uptilt.
2. Attach 5/8-inch shackles to the desired attachment points on the MG-MINA grid.



NOTE: A 2-foot length of wire rope between the shackles and motor's chain hooks is recommended to prevent the chain bags from obstructing high frequencies from the top loudspeakers.

3. Lower the motors so its chain hooks can be attached to the 5/8-inch shackles. Once the shackles are secured to the chain hooks, raise the grid slightly higher than the first stack of MINA loudspeakers to be linked.
4. Unstow the grid's links and pin them at the desired MINA angle with respect to the grid (for the maximum downtilt configuration, 0 or -5 degrees; for the maximum uptilt configuration, -5 or -10 degrees). Make sure to use the 1/4" x 0.90" quick-release pins included with the MG-MINA grid to pin the links.
5. Use the MCF-MINA caster frame to roll the first MINA stack into position under the grid. Up to five MINA loudspeakers can be safely transported with the caster frame.
6. Lower the grid to within approximately 1 inch of the top MINA cabinet. Adjust the placement of the MINA stack so the top cabinet's link slots align with the grid links. Bump the motors down so the grid links are inserted into the top cabinet's link slots. Pin the grid links to the top cabinet using the 1/4" x 0.53" quick-release pins included with MINA.
7. Check that each grid link is secured to the grid with the 1/4" x 0.90" quick-release pins included with the grid, and that each grid link is secured to the top cabinet with the 1/4" x 0.53" quick-release pins included with MINA. Make sure the other loudspeakers in the stack are securely pinned to each of their four GuideALinks secured with the MINA quick-release pins. Adjust the splay angles between the loudspeakers as necessary.




NOTE: To reduce the tension on pins when changing angles between loudspeakers, it may be necessary to bump the motors or lift the loudspeakers by hand.


8. Attach the AC power, audio, and RMS cables to the loudspeakers.
9. Raise the grid so the suspended loudspeakers are slightly off the floor and remove the two rear quick-release pins securing the bottom cabinet's GuideALinks to the caster frame. Rest the rear wheels of the caster frame on the floor and remove the two front quick-release pins to detach the caster frame from the bottom cabinet. Retract the GuideALinks for the bottom cabinet and pin them in the stowed position.
10. Raise the grid so the suspended loudspeakers are slightly higher than the next stack of MINAs to be linked. Roll away the empty caster frame.
11. Roll the next stack of MINAs into position under the suspended loudspeakers. Lower the suspended loudspeakers until they are almost touching the downstage edge of the top cabinet to be attached. Adjust the placement of the MINA stack so that when the GuideALinks from the bottom suspended cabinet are unpinned they will fall cleanly into the link slots of the cabinet being attached.

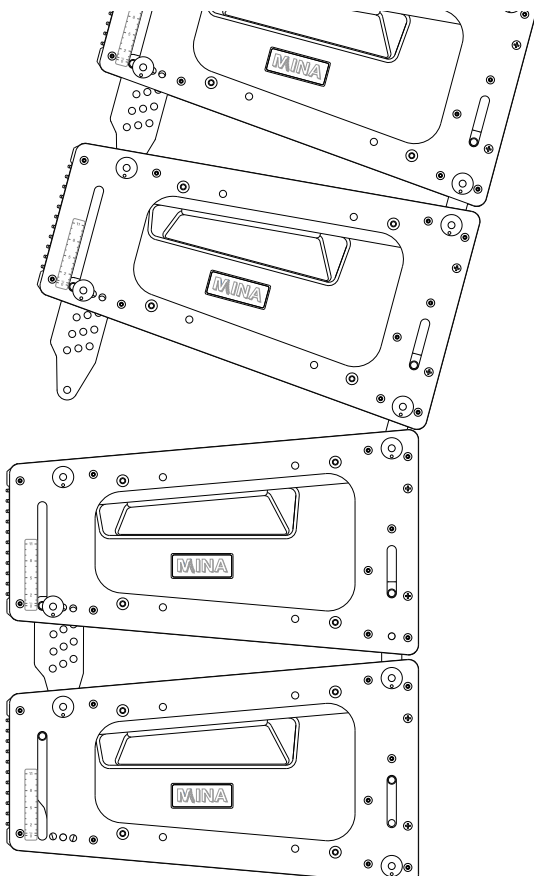


CAUTION: If the GuideALinks are not stowed as described in Step 9, you may damage the top of the cabinet being attached by hitting it with an extended link.


12. Pin the front GuideALinks first. Position and pin the rear GuideALinks of the suspended loudspeaker to the desired angle. Bump the motors to lower the rear GuideALinks into the link slots of the cabinet being attached and pin.
13. Attach the AC power, audio, and RMS cables to the newly added loudspeakers.
14. Repeat the previous steps until the entire array has been assembled. All loudspeaker-to-loudspeaker links are made with the 1/4" x 0.53" quick-release pins included with MINA.

 **NOTE:** As loudspeakers are added to the suspended array, try to keep the grid parallel to the stage surface to ease the process of adding more loudspeakers to the array. Failing to do so may place the array's center of gravity in front of the downstage motor, which could make it very difficult to control the angle of the grid and attach the rear links. In some cases, when the array length is longer than 10–12 loudspeakers, it may be necessary to push the suspended array toward the downstage direction and lower the array to close the gap between the rear of the flown and stacked loudspeakers.

 **TIP:** As the flown array is assembled and raised, MINA's front GuideALinks can rotate over 30 degrees forward while pinned, facilitating the connection of the flown, angled array to the loudspeakers on the caster frame. Roll the stack into position so the front GuideALinks align. Pin them, and then **lower the array slightly so that the rear GuideALinks can be pinned**. Finally, unpin the caster frame from the lowest enclosure. Reverse the procedure when striking the array.



Assembling a MINA Array

 **CAUTION:** Do not lift a MINA stack unless all four GuideALinks have been pinned for the top cabinet. Failing to do so could damage the end frames or GuideALinks for the linked units. Pinning only the front GuideALinks should only be done when attaching a floor stack to a suspended array.





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