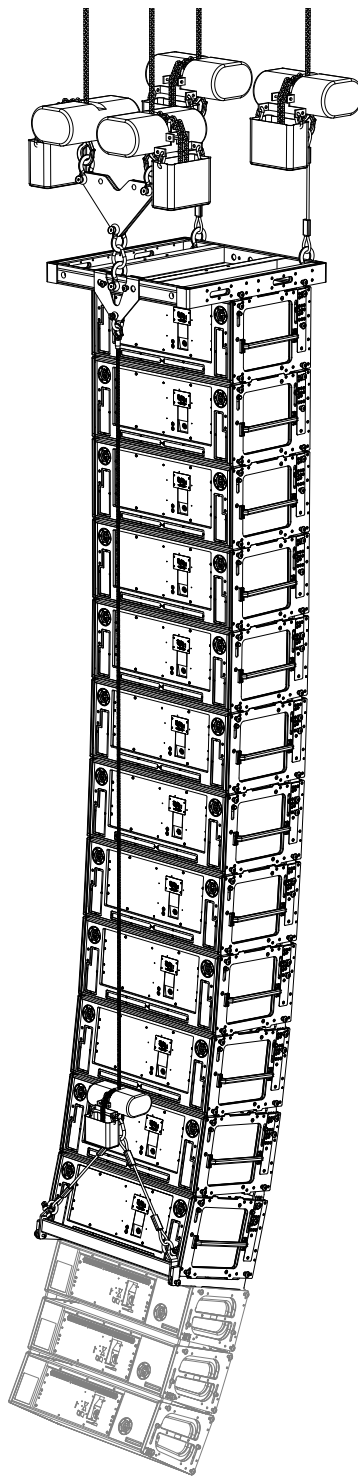


### MTG-LEO-M Top Grid and Accessories



***Keep these important operating instructions.  
Check [www.meyersound.com](http://www.meyersound.com) for updates.***

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MTG-LEO-M Top Grid and Accessories Assembly Guide, PN 05.215.049.01 A

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## CHAPTER 1: INTRODUCTION

### HOW TO USE THIS ASSEMBLY GUIDE

Make sure to read this assembly guide in its entirety before configuring a loudspeaker system with LEO-MS. In particular, pay close attention to material related to safety issues.

As you read this assembly guide, 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, or could cause delays or other problems.

Information and specifications are subject to change. Updates and supplementary information are available at [www.meyersound.com](http://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](http://www.meyersound.com/support)
- **Email:** [techsupport@meyersound.com](mailto:techsupport@meyersound.com)

### SAFETY STATEMENT FOR QUICKFLY RIGGING

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.

This Statement 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. The user must assume responsibility for making sure that 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. In all critical cases, load points are redundant, with a safety margin that allows one or more load points to fail while maintaining system integrity. 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 are advised to check the QuickFly section of the Meyer Sound website at

[www.meyersound.com](http://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 a 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 in a few 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 Statement. **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**

The 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 sub-systems 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.

## RIGGING OPTIONS FOR LEO-M

### MVP Motor Vee Plate

Attaches two motors to the front or rear center pickup point of the MTG-LEO-M top grid, to fine tune the horizontal aim of the array  $\pm 21$  degrees.

### RPP-LEO-M Rear Pull-Up Plate

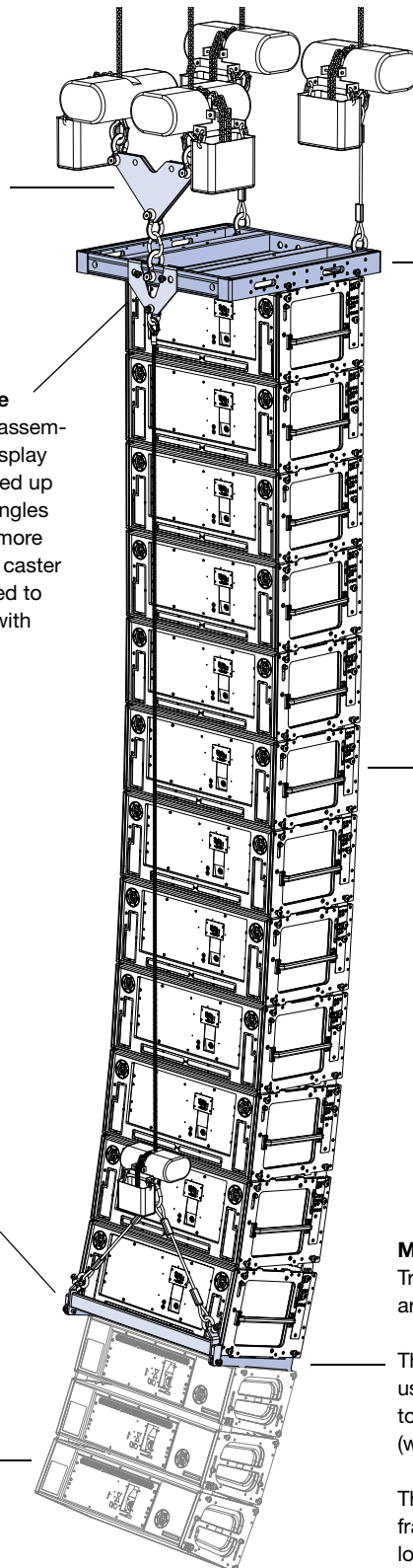
The optional pull-up plate helps assemble large flown arrays with wide splay angles. Flown arrays can be pulled up (with a motor) to expand splay angles so the blue locking pins can be more easily inserted. LEO-M stacks in caster frames can be pulled up and tilted to facilitate linking to flown arrays with severe downtilt.

### PBF-LEO-M Pull-Back Frame

The optional pull-back frame attaches to the MTF-LEO-M/MICA transition frame and provides pull-back for extreme array downtilts. The pull-back frame can also be used for pull-up to expand the array's splay angles during installation so the blue locking pins can be more easily inserted.

### Downfill

Shown with MICAs. LYON loudspeakers can also be used for downfill.



### MTG-LEO-M Top Grid

With some restrictions (see Table 1 on page 19), flies up to 18 LEO-Ms at a 7:1 safety factor, or up to 22 LEO-Ms at a 5:1 safety factor. The grid accommodates a variety of pickup configurations with six pickup points, three each on the front and rear of the grid

### LEO-M Array

### MTF-LEO-M/MICA Transition Frame

Transitions from the last LEO-M in the array to the first MICA (for downfill).

The transition frame is required when using the PBF-LEO-M pull-back frame to adjust the array's downtilt angle (with or without MICAs).

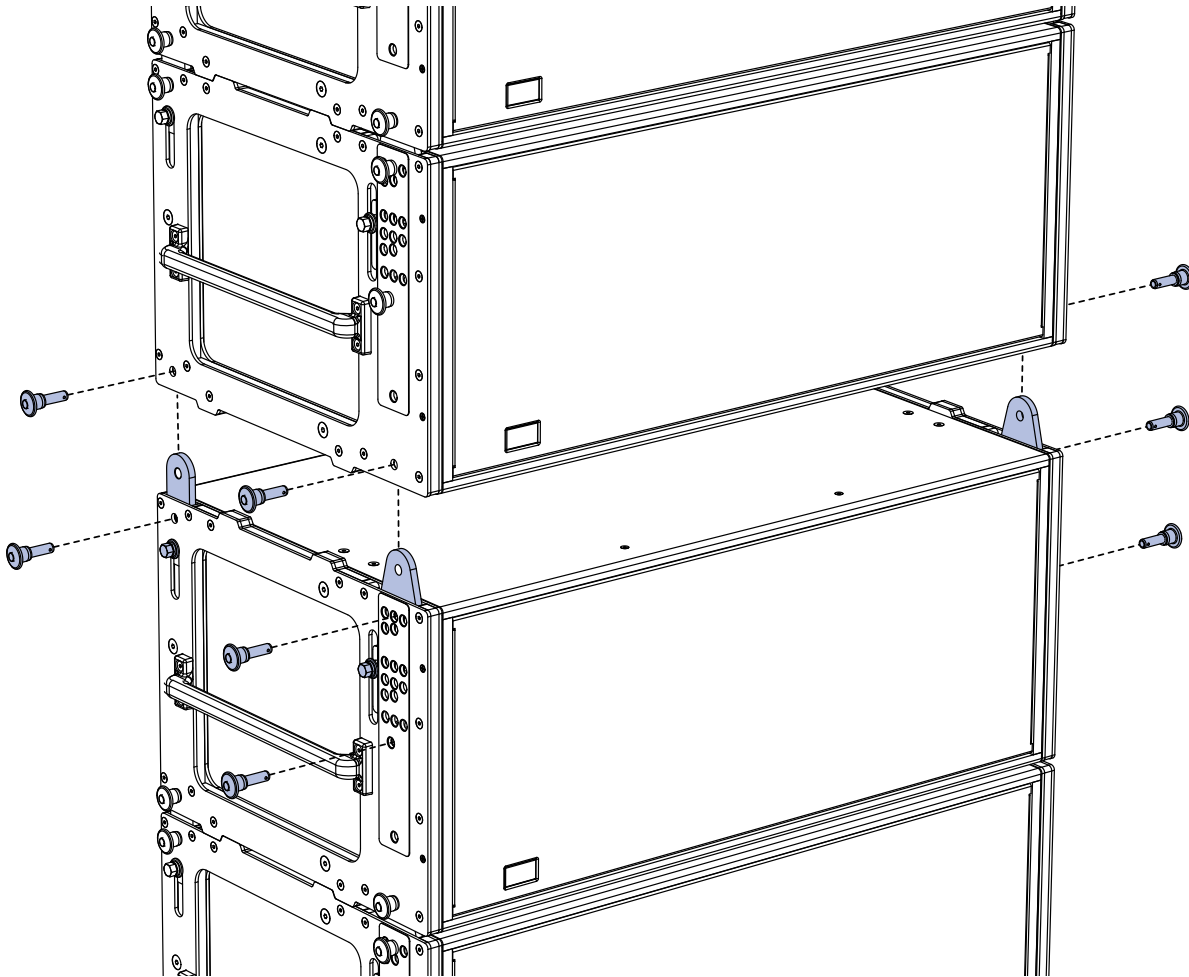
The **MTF-LEO-M/LYON** transition frame is also available for flying LYON loudspeakers below LEO-M arrays.

Figure 1: LEO-M Rigging Options

## CHAPTER 2: LEO-M GUIDEALINKS

### LEO-M GUIDEALINKS

LEO-M is equipped with four captive GuideALinks that link to adjacent units in flown arrays. Located at the top corners of the cabinet, the GuideALinks extend up and into the link slots of the cabinet above it (or into the link slots of the MTG-LEO-M top grid). The links extend and retract with recessed knobs and are secured with quick-release pins. Cabinets can be easily linked once they are stacked, since the GuideALinks extend up and into the link slots of the cabinet above. Each LEO-M loudspeaker ships with 10 1/2 x 1.25-inch quick-release pins (blue button) (PN 134.044).

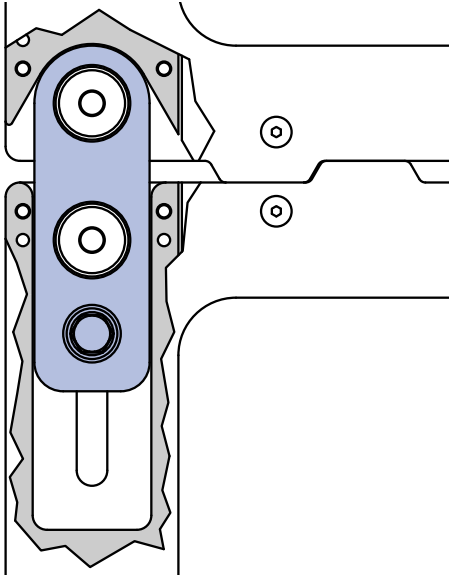


*LEO-M GuideALinks with Quick-Release Pins*

**CAUTION:** LEO-M GuideALinks must be secured with the included quick-release pins. At no time should the weight of the loudspeaker rest on the GuideALink knobs when the links are fully extended (without the pins inserted). GuideALink knobs are for extending and retracting the links only.

## Rear GuideALinks

The rear GuideALinks attach at a fixed splay angle of 0 degrees and act as a pivot point between linked LEO-Ms, with the splay angle between the units determined by the front GuideALink positions. The rear GuideALinks can be pinned in either of two positions: extended or stowed.



LEO-M Rear GuideALink Extended and Pinned



**CAUTION:** LEO-M GuideALinks must be secured with the included quick-release pins. At no time should the weight of the loudspeaker rest on the GuideALink knobs when the links are fully extended (without the pins inserted). GuideALink knobs are for extending and retracting the links only.

## Front GuideALinks

The front GuideALinks determine the loudspeaker's splay angle and are configured with the yellow ANGLE positions when the cabinets are resting in caster frames. After the stack is lifted with the motors, the loudspeakers rotate on the axis of the rear GuideALinks and the front GuideALinks slide into position as the weight of the loudspeakers causes the cabinets to shift, at which point, quick-release pins are inserted in the corresponding blue LOCKING positions to lock the splay angles.

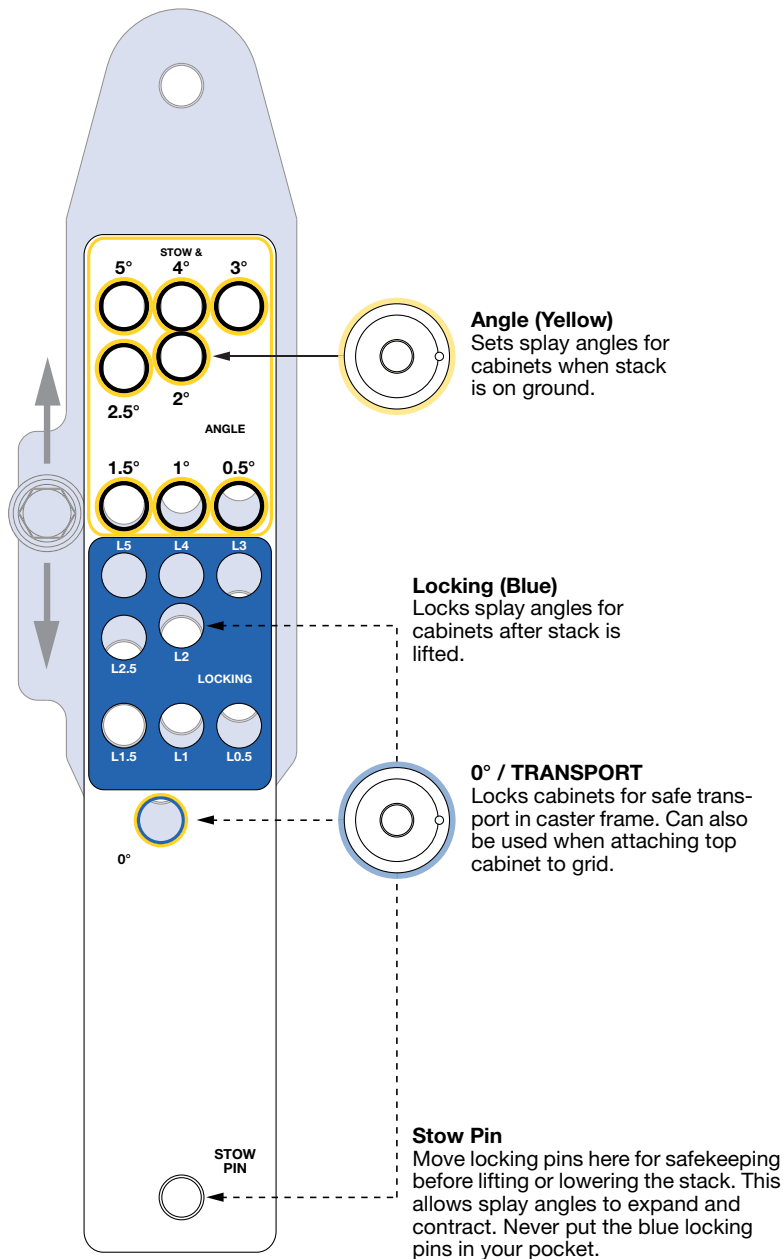
Available splay angles for linked LEO-Ms include 0.0, 0.5, 1.0, 1.5, 2.0, 3.0, 4.0, and 5.0 degrees and are indicated by the blue and yellow GuideALink labels.



**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 degrees 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 MTG-LEO-M top grid, the angles of the loudspeakers in the array above them, and other factors. MAPP Online XT should be used to calculate optimum splay angles for loudspeakers and to predict coverage patterns for arrays.



**NOTE:** Optimal acoustical performance for LEO-M arrays is achieved by using the appropriate number of units and appropriate splay angles to meet the coverage requirements of the venue. You should use MAPP Online XT to calculate optimum splay angles for loudspeakers and to predict coverage patterns for arrays.



LEO-M Front GuideALink Label with Angle and Locking Pins

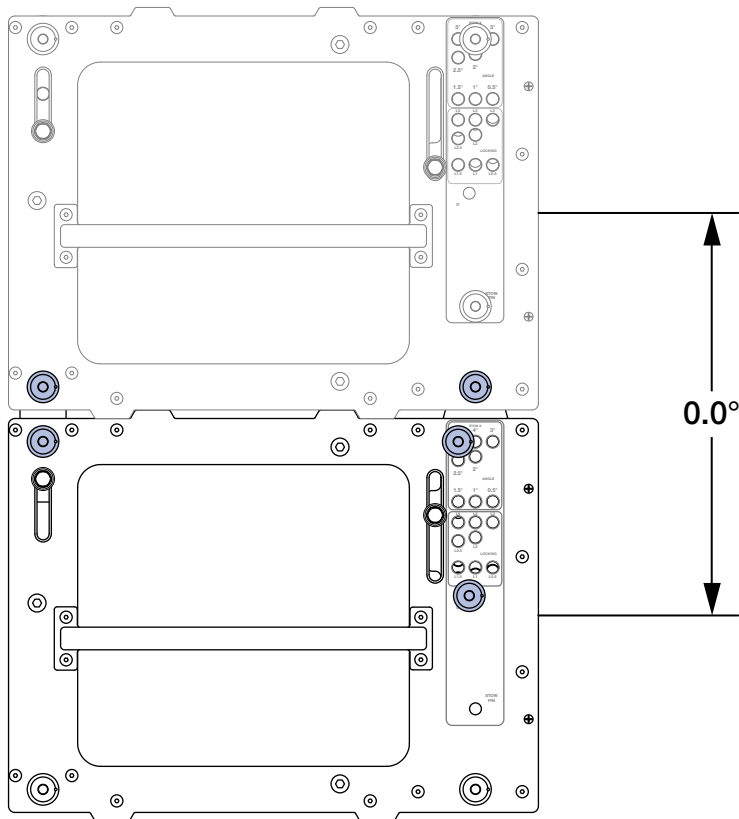
**CAUTION:** LEO-M GuideALinks must be secured with the included quick-release pins. At no time should the weight of the loudspeaker rest on the GuideALink knobs when the links are fully extended (without the pins inserted). GuideALink knobs are for extending and retracting the links only.

## GUIDEALINK CONFIGURATIONS

The following sections document how to configure LEO-M GuideALinks.

### Configuring GuideALinks for 0 Degrees

When configuring GuideALinks for 0 degrees, both the yellow ANGLE and blue LOCKING positions are pinned before lifting the stack. This procedure differs from the one described in “Configuring GuideALinks for 0.5, 1.0, 1.5, 2.0, 3.0, 4.0, and 5.0 Degrees” on page 13.



*LEO-M Cabinet (Bottom) Configured for 0-Degree Splay Angle*

To configure GuideALinks for a splay angle of 0 degrees:

1. Pin the rear and front GuideALinks to the cabinet above.
2. Insert quick-release pins in any of the yellow ANGLE positions. For a splay angle of 0 degrees, it does not matter which ANGLE position is chosen.
3. Before lifting the stack, insert quick-release pins in the 0-degree position (below the blue LOCKING positions).



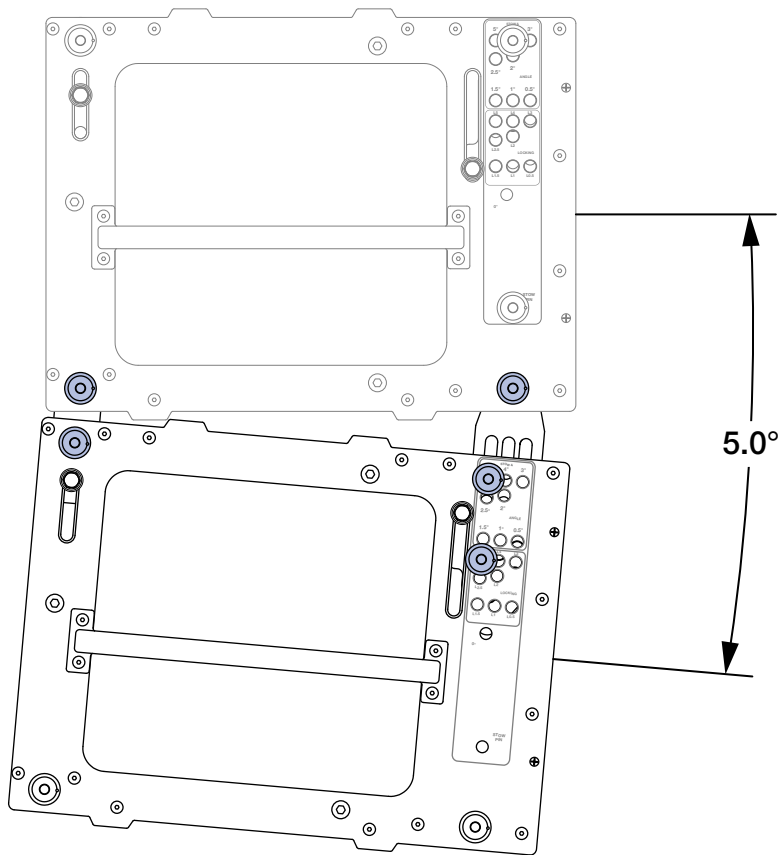
**CAUTION:** Splay angles of 0 degrees should only be used for the top cabinet attached to the grid. Splay angles of at least 0.5 degrees are recommended for cabinets near the top of the array. If multiple cabinets are set to 0 degrees and the array is flown with downtilt, the resulting splay angles could be negative because of the gaps in the links and pins that facilitate easy pinning.



**CAUTION:** When LEO-Ms are stacked in the MCF-LEO-M caster frame, each of the cabinets should be set to splay angles of 0 degrees, except for the top cabinet, which should be configured as stowed. For more information, see “Configuring GuideALinks for Transport” on page 14.



## Configuring GuideALinks for 0.5, 1.0, 1.5, 2.0, 3.0, 4.0, and 5.0 Degrees



*LEO-M Cabinet (Bottom) Configured for 5-Degree Splay Angle*

To configure GuideALinks for splay angles of 0.5, 1.0, 1.5, 2.0, 3.0, 4.0, or 5.0 degrees:

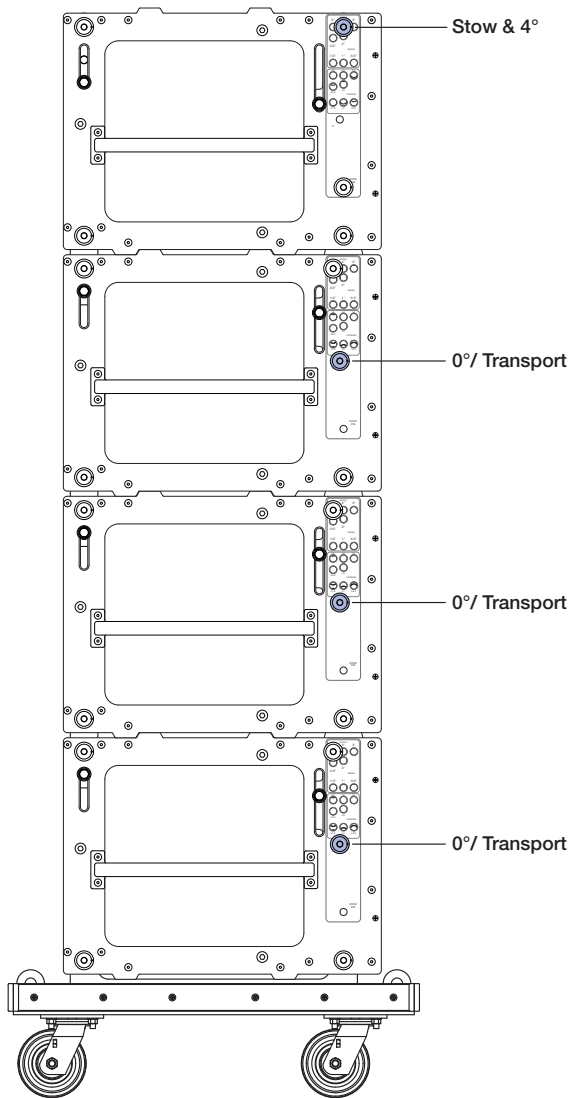
1. Pin the rear and front GuideALinks to the cabinet above.
2. Insert quick-release pins in the desired yellow **ANGLE** position. For example, for a splay angle of 5 degrees, insert quick-release pins in the yellow 5-degree **ANGLE** position.
3. Before lifting the stack, remove the quick-release pins from the blue **LOCKING** positions and insert them temporarily in the **STOW PIN** position. This will allow splay angles to extend when the stack is lifted.
4. After the stack has been attached to the array and lifted with the motors, to lock the splay angles, remove the pins from the **STOW PIN** position and insert them in the corresponding blue **LOCKING** positions. For example, to lock the splay angles at 5 degrees, insert the quick-release pins in the blue 5-degree **LOCKING** position.

**CAUTION:** After stacks have been attached to the array and lifted with the motors, make sure that for each cabinet, the quick-release pins for the blue **LOCKING** positions match those of the corresponding yellow **ANGLE** positions, and that the quick-release pins for the left and right sides mirror each other.

**TIP:** When inserting quick-release pins in the blue **LOCKING** positions (for splay angles of 0.5, 1.0, 1.5, 2.0, 3.0, 4.0, and 5.0 degrees), a good visual clue is to make sure they are located three holes below those of the corresponding yellow **ANGLE** positions.

## Configuring GuideALinks for Transport

When LEO-Ms are stacked in the MCF-LEO-M caster frame, each of the cabinets should be set to splay angles of 0 degrees, except for the top cabinet, which should be configured as stowed.



*LEO-M Cabinets Configured for Transport*

To configure GuideALinks for transport with the MCF-LEO-M caster frame:

1. Pin the MCF-LEO-M caster frame to the bottom cabinet.
2. Configure GuideALinks for the bottom three cabinets:
  - Pin the rear and front GuideALinks to the cabinets above.
  - Insert quick-release pins in the desired yellow ANGLE position. For example, for a splay angle of 5 degrees, insert quick-release pins in the yellow 5-degree ANGLE position.
  - Remove the quick-release pins from the blue LOCKING positions and insert them in the 0-degree position (just below the blue LOCKING positions).

3. Configure GuideALinks for the top cabinet:

- Lower the rear GuideALinks and pin them to the stowed position.
- Lower the front GuideALinks and pin them to the yellow STOW & 4-degree ANGLE position.

## WHEN TO MOVE THE LOCKING PINS TO THE “STOW PIN” POSITION

The quick-release pins in the blue LOCKING positions must be moved to the STOW PIN position before either lifting or lowering an array. The removal of the quick-release pins from the LOCKING positions allows the splay angles to expand and contract when assembling and disassembling the array. Moving the pins to the STOW PIN position also keeps them handy so they won't be dropped or misplaced.



**TIP:** Resist the urge to put the blue locking pins in your pocket. Instead place them in the STOW PIN position before lifting or lowering the array.

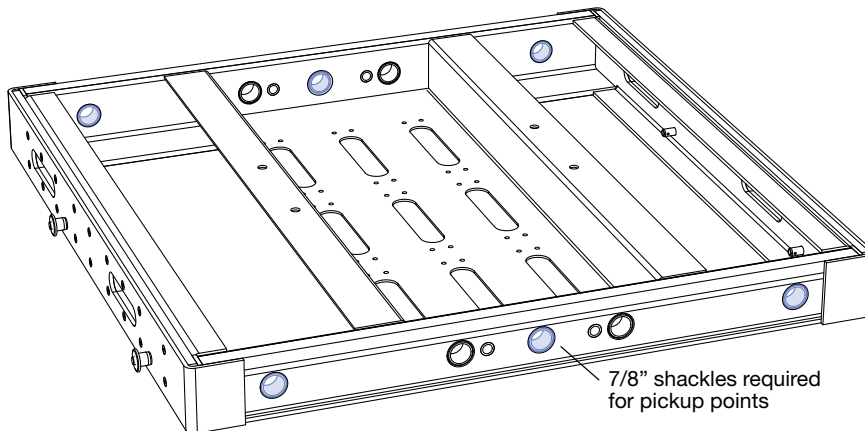


**TIP:** For detailed instructions on assembling LEO-M arrays, refer to Appendix A, “Assembling Arrays with the MTG-LEO-M Top Grid.”




## CHAPTER 3: MTG-LEO-M TOP GRID


With some restrictions (see Table 1 on page 19), the MTG-LEO-M top grid flies LEO-M arrays of up to 18 cabinets at a 7:1 safety ratio, or up to 22 cabinets at a 5:1 safety ratio. The grid accommodates a variety of pickup configurations with six pickup points, three each on the front and rear of the grid. The grid also includes attachment points that accommodate brackets and adapters for lasers and inclinometers (see Appendix B, “Laser Bracket”).





*MTG-LEO-M Top Grid (Attachment Points Highlighted in Blue)*


The MTG-LEO-M and its attached array can be tilted by adjusting the chain motors above the grid, or by suspending the grid from differing lengths of steel or SpanSets. The grid can be oriented to provide either maximum array downtilt or maximum arrow uptilt (see “MTG-LEO-M Top Grid Orientation” on page 23).

 **CAUTION:** Always use the 1/2 x 1.50-inch quick-release pins (red button) included with the MTG-LEO-M top grid to secure the attached LEO-M. Do not use the quick-release pins included with LEO-M in the grid as they are shorter and will not lock in place.

 **CAUTION:** Always use properly rated rigging hardware. The MTG-LEO-M top grid requires 7/8-inch shackles for its pickup points.

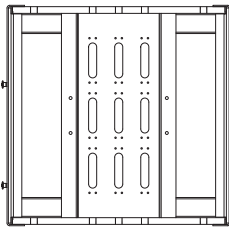
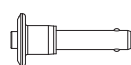
 **CAUTION:** The two holes immediately to the left and right of the center pickup points are for aiming lasers or inclinometers (see, Appendix B, “Laser Bracket”). These holes should not be used for pickup points.

 **TIP:** The MTG-LEO-M top grid includes attachment points that accommodate brackets and adapters for lasers and inclinometers. For more information, see Appendix B, “Laser Bracket.”

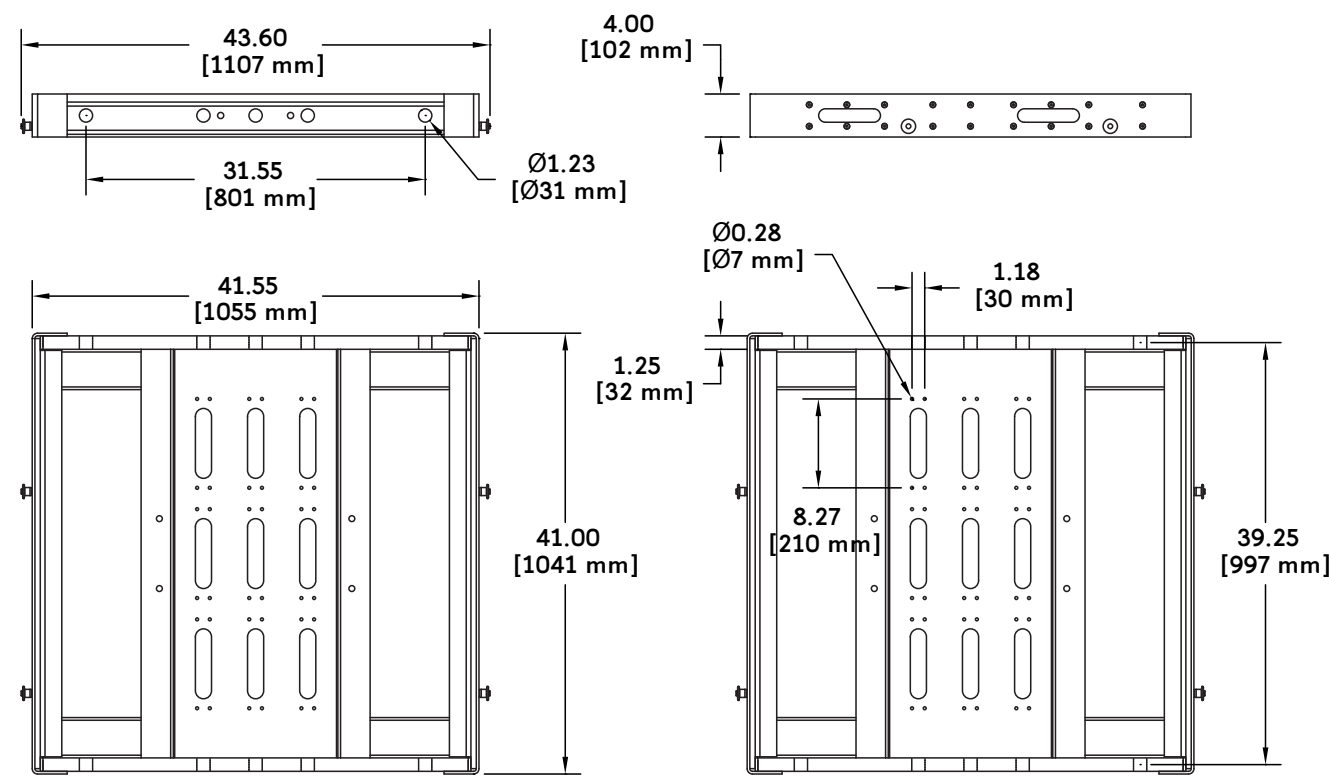
 **TIP:** The MTG-LEO-M top grid can travel installed on top of LEO-M stacks in the MCF-LEO-M caster frame.

MTG-LEO-M TOP GRID KIT CONTENTS

MTG-LEO-M Top Grid Kit, PN 40.220.030.01

	Quantity	Part Number	Item
	1	45.220.030.01	MTG-LEO-M top grid
	4	134.045	1/2 x 1.50" quick-release pins (red button)

MTG-LEO-M TOP GRID DIMENSIONS



MTG-LEO-M Top Grid Dimensions

MTG-LEO-M Top Grid Weight: 205 lbs (93.0 kg)

## MTG-LEO-M TOP GRID LOAD RATINGS

Table 1 lists the maximum number LEO-M cabinets that can be flown from the MTG-LEO-M top grid (with no downfill). For additional load requirements, see “Additional Requirements for MTG-LEO-M Top Grid Load Ratings” on page 21.

**Table 1: MTG-LEO-M Top Load Ratings with LEO-Ms**

	Maximum Flown LEO-Ms			
	No Splay Angle Restrictions, No Downfill Loudspeakers		Top Half of LEO-M Array with Splay Angles of 2° or Less, Bottom Half with 5° or Less, No Down Fill Loudspeakers	
	5:1 Safety Factor	7:1 Safety Factor	5:1 Safety Factor	7:1 Safety Factor
	19	16	22	18



**NOTE:** Additional array configurations for the MTG-LEO-M top grid are possible. Use MAPP Online XT to verify whether configurations exceed load ratings. You can also use MAPP Online XT to verify whether configurations meet BGV C1 requirements.



**NOTE:** The grid tilt should not be larger than the one achieved by the natural rotation of the array (except when using the PBF-LEO-M pull-back frame for pull-back, see Chapter 8, “PBF-LEO-M Pull-Back Frame”).

## MTG-LEO-M Top Grid Load Ratings with Downfill LYONs

Table 2 lists the maximum number of downfill LYON cabinets that can be flown from the MTG-LEO-M top grid with the MTF-LEO-M/LYON transition frame. For additional load requirements, see “Additional Requirements for MTG-LEO-M Top Grid Load Ratings” on page 21. For additional information on the MTF-LEO-M/LYON transition frame, including weight, dimensions, and kit contents, see Chapter 6, “MTF-LEO-M/LYON Transition Frame.”

**Table 2: MTG-LEO-M Top Load Ratings with LEO-Ms and LYONs**

Number of Flown LEO-Ms	Maximum Flown LYONs			
	No Splay Angle Restrictions		Top Half of LEO-M Array with Splay Angles of 2° or Less, Bottom Half with 5° or Less, LYONs with Any Splay Angles	
	5:1 Safety Factor	7:1 Safety Factor	5:1 Safety Factor	7:1 Safety Factor
8	8	7	8	7
9	8	6	8	7
10	8	6	8	6
11	8	6	8	6
12	8	5	8	6
13	7	3	8	5
14	6	2	8	4
15	5	1	7	3
16	4		6	2
17	2		5	1
18	1		4	
19			3	
20			2	
21			1	
22				

## MTG-LEO-M Top Grid Load Ratings with Downfill MICAs

Table 2 lists the maximum number of downfill MICA cabinets that can be flown from the MTG-LEO-M top grid with the MTF-LEO-M/MICA transition frame. For additional load requirements, see “Additional Requirements for MTG-LEO-M Top Grid Load Ratings” on page 21. For additional information on the MTF-LEO-M/MICA transition frame, including weight, dimensions, and kit contents, see Chapter 7, “MTF-LEO-M/MICA Transition Frame.”

**Table 3: MTG-LEO-M Top Load Ratings with LEO-Ms and MICAs**

Number of Flown LEO-Ms	Maximum Flown MICAs			
	No Splay Angle Restrictions		Top Half of LEO-M Array with Splay Angles of 2° or Less, Bottom Half with 5° or Less, MICAs with Any Splay Angles	
	5:1 Safety Factor	7:1 Safety Factor	5:1 Safety Factor	7:1 Safety Factor
8	6	5	6	5
9	6	5	6	5
10	6	5	6	5
11	6	5	6	5
12	5	5	6	5
13	5	5	6	5
14	5	3	6	5
15	5	2	5	5
16	4		5	3
17	3		5	2
18	2		5	1
19			4	
20			3	
21			2	
22				



## ADDITIONAL REQUIREMENTS FOR MTG-LEO-M TOP GRID LOAD RATINGS

The load ratings in Table 1, Table 2, and Table 3 are only supported when the following requirements are observed:


- Always use properly rated rigging hardware. The MTG-LEO-M top grid requires 7/8-inch shackles for its pickup points.
- Supported pickup points are: two center points, three points, or four corner points.
- If a bridle is used between pickup points, the bridle angle at the apex must not be greater than 90 degrees.
- The minimum supported leg length for front-to-rear bridle attachments is 29 inches (737 mm). The minimum supported leg length for side-to-side bridle attachments is 23 inches (584 mm). Using a bridle leg shorter than the recommended length reduces the load rating and may damage the MTG-LEO-M top grid.
- The array should not be pulled from points other than those on the grid (except when using the PBF-LEO-M pull-back frame for pull-back, see Chapter 8, “PBF-LEO-M Pull-Back Frame”).
- The grid tilt should not be larger than the one achieved by the natural rotation of the array (except when using the PBF-LEO-M pull-back frame for pull-back, see Chapter 8, “PBF-LEO-M Pull-Back Frame”).
- The maximum number of LEO-M loudspeakers that can be flown is based on a weight of 265 lbs (120.2 kg) for each LEO-M cabinet.
- The maximum load ratings regard the MTG-LEO-M top 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 MTG-LEO-M top grid has not been included in Table 1 on page 19. The table rates the maximum load for the grid. Pickup points and motors that will suspend the grid must be rated to the support the total weight of the grid (205 lbs, 93.0 kg) and its suspended loudspeakers (see Table 1 on page 19).



## CHAPTER 4: FLYING LEO-M ARRAYS

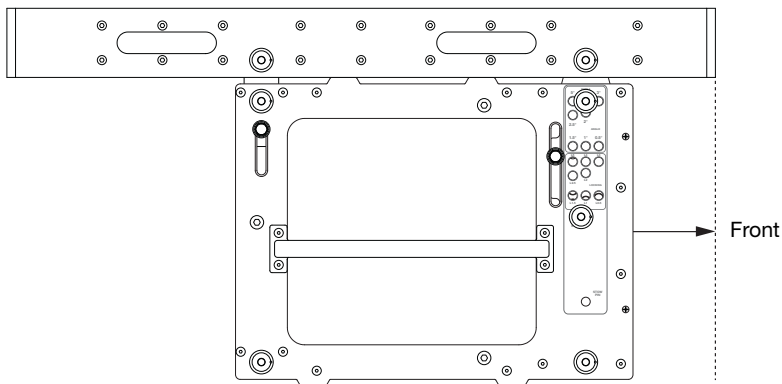
### MTG-LEO-M TOP GRID ORIENTATION

The MTG-LEO-M top grid can be oriented to place the array's center of gravity closer to the front or rear of the grid, for maximum downtilt or maximum uptilt.

 **TIP:** The MTG-LEO-M top grid and its attached array can be tilted by adjusting the chain motors above the grid, or by suspending the grid from differing lengths of steel or SpanSets.

### MTG-LEO-M Oriented for Maximum Array Downtilt (Forward)

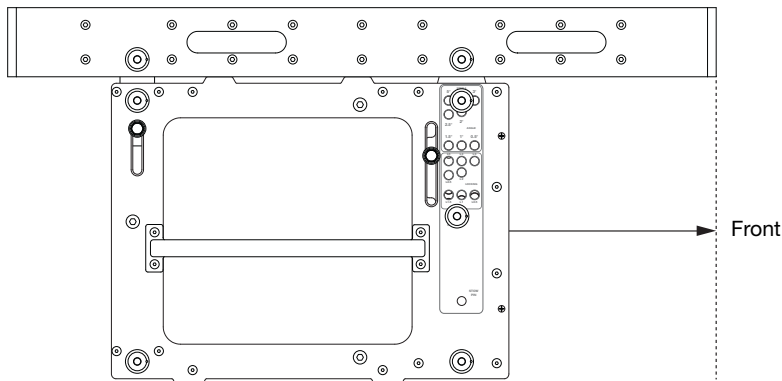
When the MTG-LEO-M grid is oriented with its quick-release pins near the front of the grid, the array's center of gravity is closer to the front of the grid so that the grid's rear pickup points can be used to achieve maximum array downtilt.




*MTG-LEO-M Top Grid Oriented for Maximum Array Downtilt*

### MTG-LEO-M Oriented for Maximum Array Uptilt (Rearward)

When the MTG-LEO-M top grid is oriented with its quick-release pins near the rear of the grid, the array's center of gravity is closer to the rear of the grid so that the grid's front pickup points can be used to achieve maximum array uptilt.

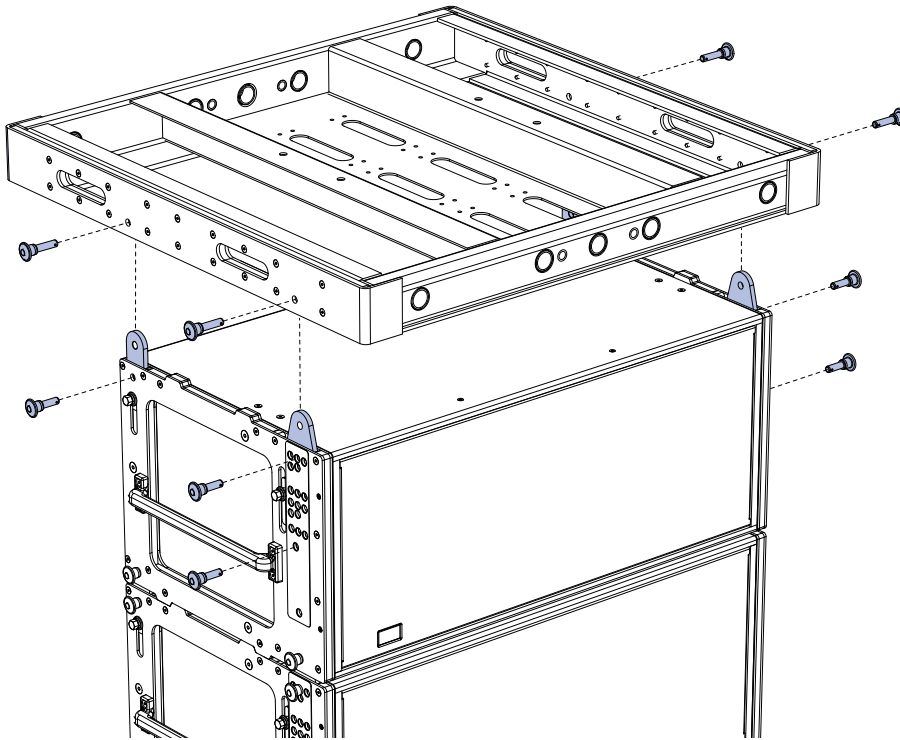


*MTG-LEO-M Top Grid Oriented for Maximum Array Uptilt*

 **TIP:** If the array will not be flown with downtilt or uptilt, you should always use the maximum uptilt orientation, as it is easier to build arrays in this configuration, easier for the splay angles to expand when the array is lifted, and therefore easier to insert the quick-release pins in the blue LOCKING positions.

## ATTACHING THE ARRAY TO THE MTG-LEO-M

The MTG-LEO-M top grid has four bottom link slots, two on each side of the grid, that accept GuideALinks from the top cabinet in the array. The configuration of the GuideALinks for the top cabinet determines the angle of its attachment (see “GuideALink Configurations” on page 12). The grid includes four 1/2 x 1.50-inch quick-release pins (red button) for securing the top cabinet.




*MTG-LEO-M Top Grid with LEO-M, Exploded View*





**CAUTION:** Always use the 1/2 x 1.50-inch quick-release pins (red button) included with the MTG-LEO-M top grid to secure the attached LEO-M. Do not use the quick-release pins included with LEO-M in the grid as they are shorter and will not lock in place.

## MTG-LEO-M PICKUP CONFIGURATIONS

The MTG-LEO-M top grid accommodates a variety of pickup configurations with its six pickup points, three each on the front and rear of the grid. When possible, use the front and rear pickup points to change the tilt of the grid with front and rear motors.

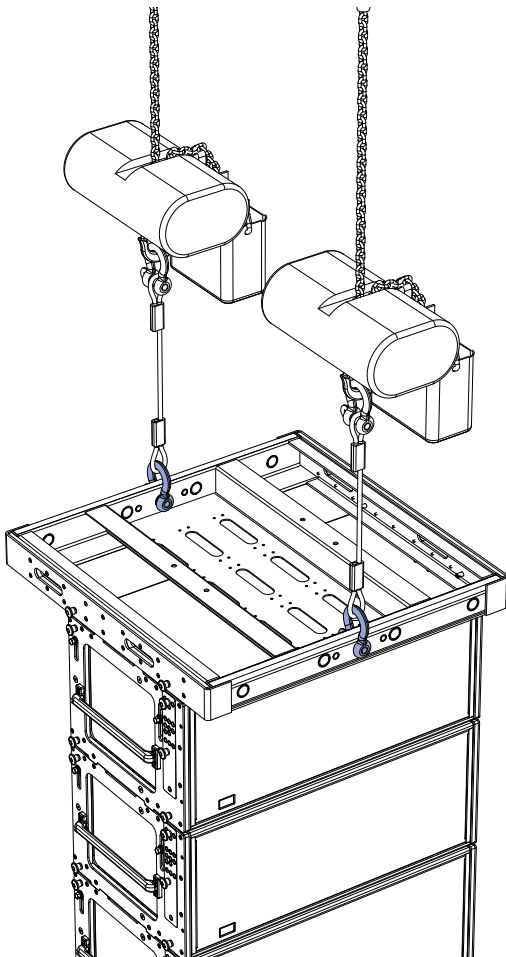
 **CAUTION:** Always use properly rated rigging hardware. The MTG-LEO-M top grid requires 7/8-inch shackles for its pickup points.

 **CAUTION:** When using bridles between pickup points on the MTG-LEO-M, 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.


 **CAUTION:** The two holes immediately to the left and right of the center pickup points are for aiming lasers or inclinometers (see, Appendix B, “Laser Bracket”). These holes should not be used for pickup points.

### Two Pickup Points

The MTG-LEO-M top grid supports the following configuration with two pickup points.



*2 to 2 Center Point Configuration (Right)*

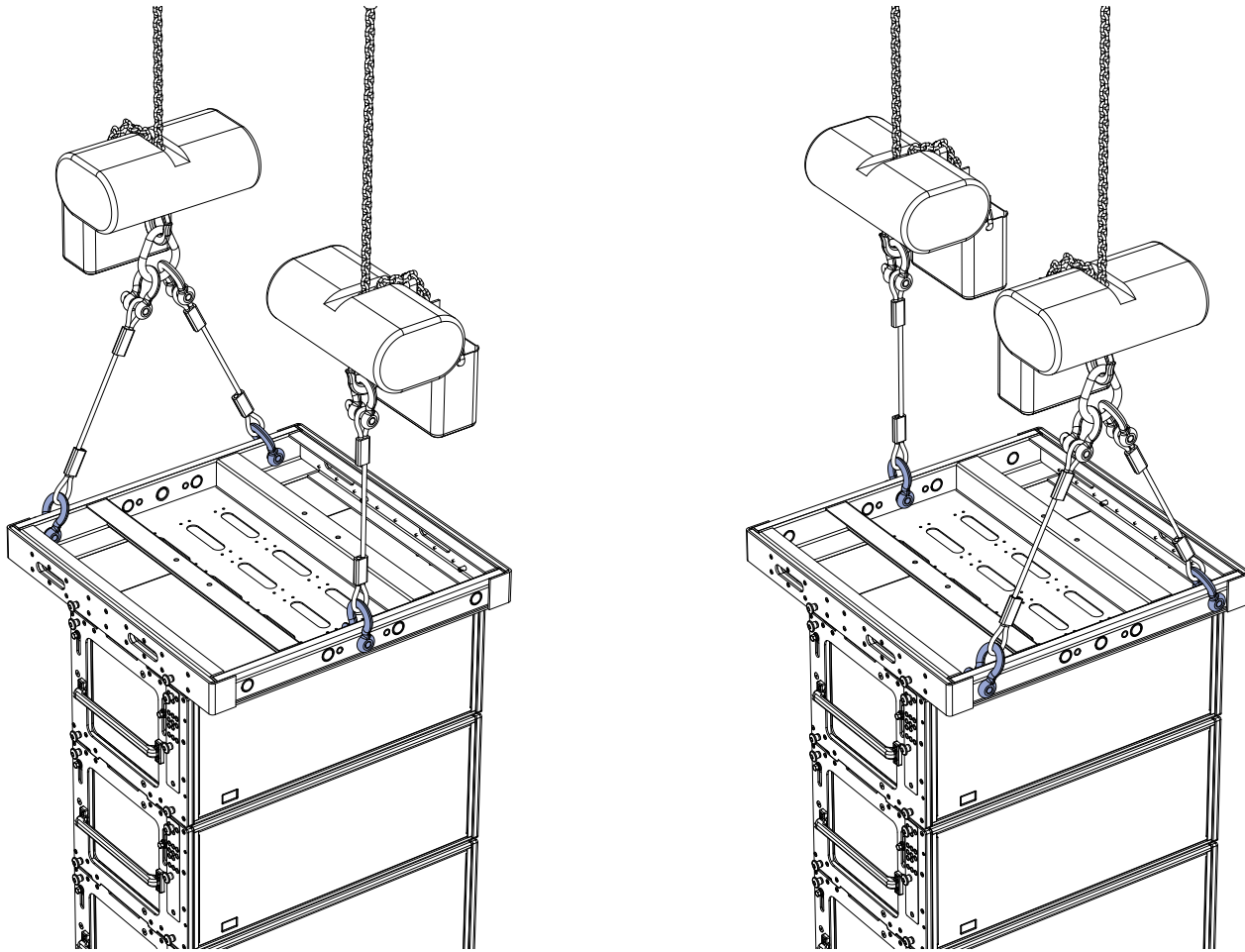
 **CAUTION:** When suspending MTG-LEO-M arrays from one or two motors, make sure each motor and ceiling pickup point (above the hook) are rated to hold the total weight of the grid and array.



**NOTE:** Single-motor configurations, with front-rear bridle attachments, are supported. However, this configuration does not provide any means of adding tilt to the array, nor does it facilitate configuration of the array so splay angles can fully extend and lock with the blue locking pins.

### Three Pickup Points

The MTG-LEO-M top grid supports the following configurations with three pickup points.



3 to 2 Corner/Center Point Configuration (Left), 3 to 2 Center/Corner Point Configuration (Right)



**CAUTION:** When suspending MTG-LEO-M arrays from one or 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.



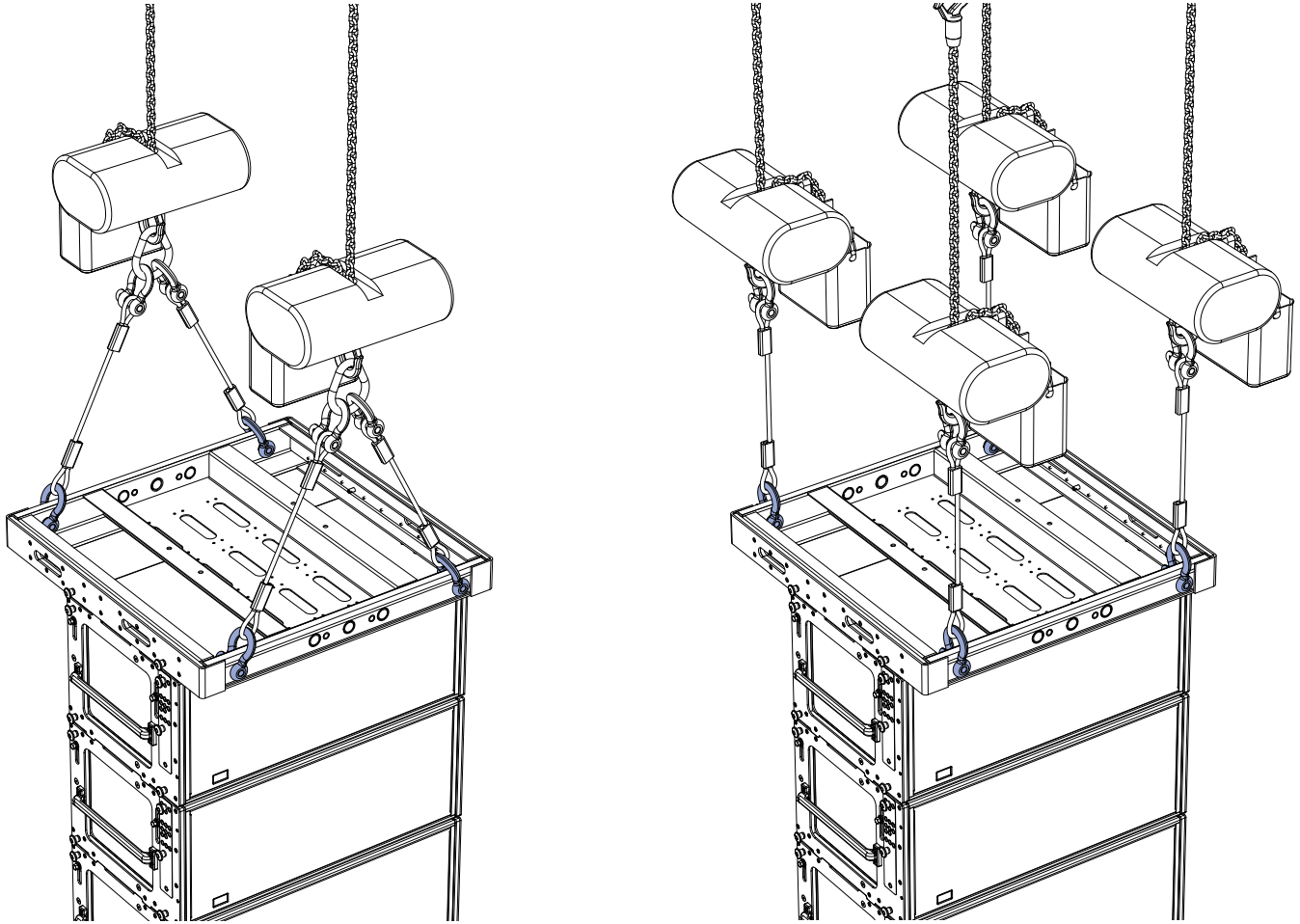
**CAUTION:** The minimum leg length for side-to-side bridle attachments is 23 inches (584 mm).



**CAUTION:** For configurations with three pickup points and a bridle, make sure to place the bridle on the side with the higher load value.

## Four Pickup Points

The MTG-LEO-M top grid supports the following configurations with four pickup points.



4 to 2 Corner Point Configuration (Left), 4 to 4 Corner Point Configuration (Right)



**CAUTION:** When suspending MTG-LEO-M arrays from one or 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.



**CAUTION:** The minimum leg length for front-to-rear bridle attachments is 29 inches (737 mm).



**CAUTION:** The minimum leg length for side-to-side bridle attachments is 23 inches (584 mm).



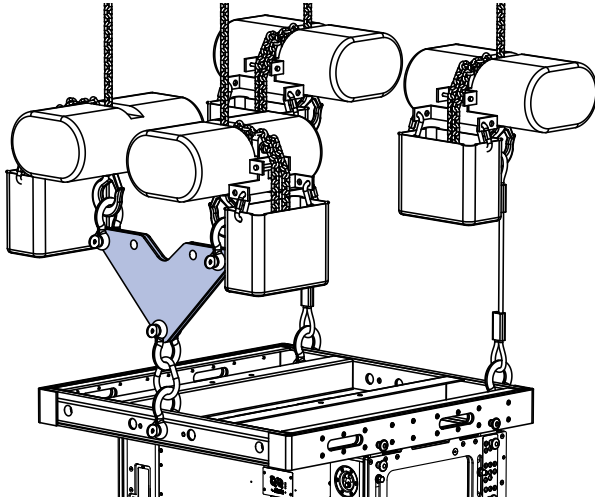
**TIP:** For configurations with the MVP motor Vee plate, which provides horizontal aiming of the array, see Chapter 5, “MVP Motor Vee Plate.”



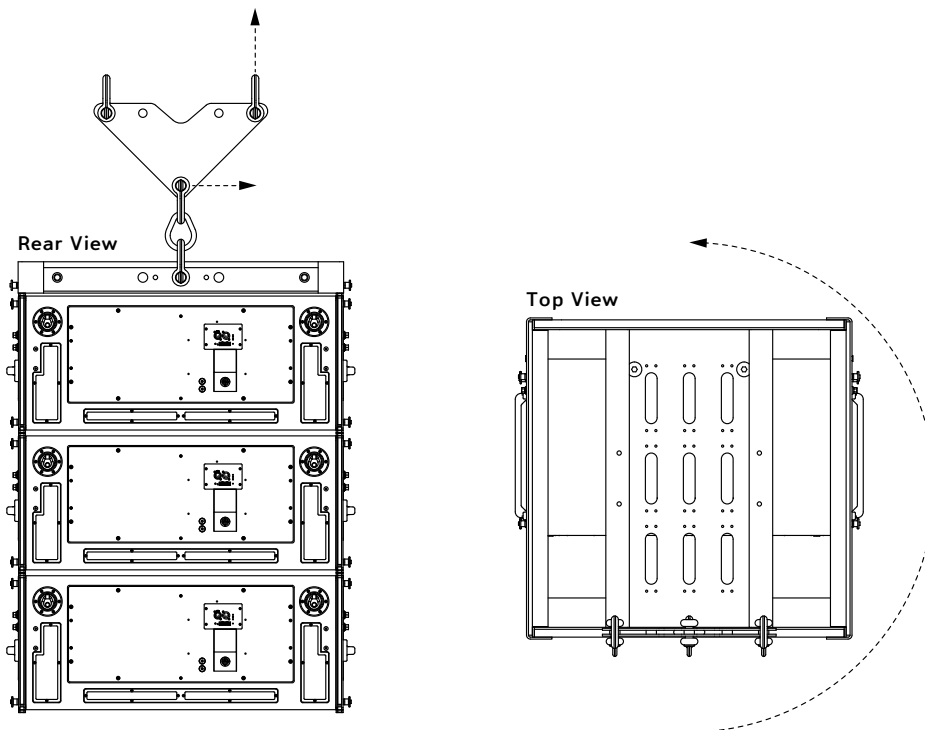


## CHAPTER 5: MVP MOTOR VEE PLATE

The optional MVP motor Vee plate fine tunes the horizontal aim of LEO-M arrays  $\pm 21$  degrees. The bottom of the Vee plate attaches to the grid's front or rear center pickup point, while the top corners of the Vee plate attach to two motors, which, when adjusted, affect the horizontal rotation of the grid. The Vee plate's attachment points require 3/4-inch or 7/8-inch shackles.




*MVP Motor Vee Plate Attached to MTG-LEO-M Top Grid*




*MVP Motor Vee Plate, Pulling Up on Right Motor Rotates Grid Counterclockwise*



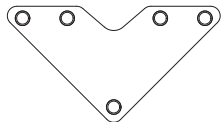
**CAUTION:** Always use properly rated rigging hardware. The MVP motor Vee plate requires 3/4-inch or 7/8-inch shackles for its attachment points.

 **CAUTION:** The MVP motor Vee plate should always be placed on the grid side (front or rear) with the lower load value.

 **NOTE:** The MVP motor Vee plate is compatible with any Meyer Sound multipurpose grid or top grid with center pickup points.

MVP MOTOR VEE PLATE KIT CONTENTS

MVP Motor Plate Kit, PN 40.215.184.01

	Quantity	Part Number	Item
	1	45.215.184.01	MVP motor Vee plate

MVP Motor Vee Plate Weight: 20 lbs (9.1 kg)


MVP MOTOR VEE PLATE LOAD RATINGS


The MVP motor Vee plate has the following load ratings:


	5:1	7:1
Maximum Number of LEO-M Cabinets (+ MTG-LEO-M Top Grid)	22	18

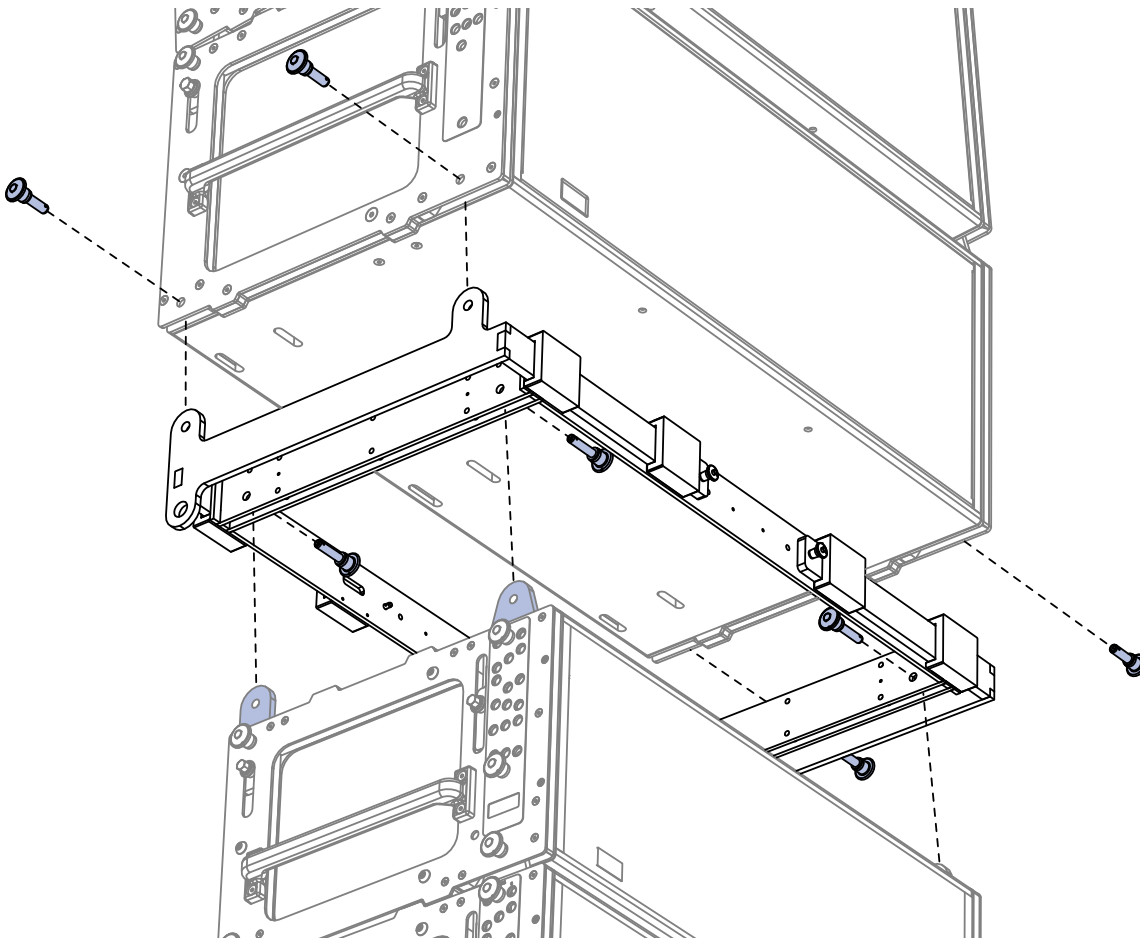
## CHAPTER 6: MTF-LEO-M/LYON TRANSITION FRAME

The optional MTF-LEO-M/LYON transition frame flies up to seven LYON loudspeakers at a 7:1 safety factor below LEO-M arrays for downfill. The transition frame attaches to the bottom cabinet in the LEO-M array at an angle of 0 degrees and is secured with the quick-release pins included with LEO-M. The top LYON cabinet attaches to the transition frame's inner link slots and is secured with the four 7/16 x 1.50-inch quick-release pins (red button) included with the transition frame. The configuration of GuideALinks for the top LYON cabinet determines the angle of its attachment, from 0.0 to 9.0 degrees. The MTF-LEO-M/LYON transition frame is collapsible for easy transport and also includes rear pickup points for pull-back and pull-up.


 **CAUTION:** When flying combined arrays, the total weight of the arrays and transition and pull-back hardware should be calculated, before the arrays are flown, to verify that the weight does not exceed the load ratings for the MTG-LEO-M top grid (see "MTG-LEO-M Top Grid Load Ratings" on page 19).

 **CAUTION:** Always use the 7/16 x 1.50-inch quick-release pins (red button) included with the MTG-LEO-M/LYON transition frame to secure the attached LYON. Do not use the quick-release pins included with LYON in the transition frame as they are shorter and will not lock in place.

 **CAUTION:** Always use properly rated rigging hardware. The MTF-LEO-M/LYON transition frame requires 5/8-inch shackles for its pickup points.

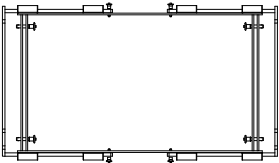
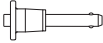
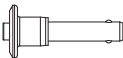


*MTF-LEO-M/LYON Transition Frame with LYONs flown by LEO-M Array*

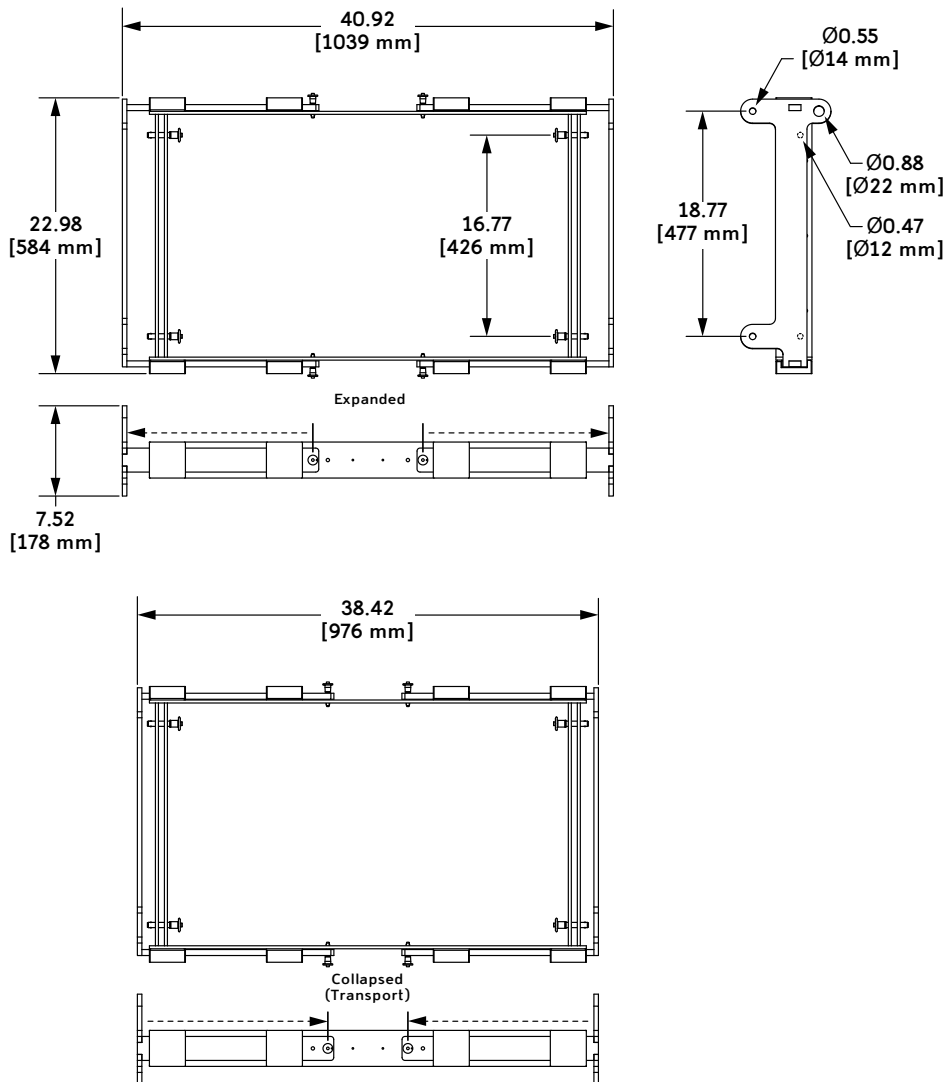
 **TIP:** The MTF-LEO-M/LYON transition frame can travel installed on top of LYON stacks in the MCF-LYON caster frame.

**MTF-LEO-M/LYON TRANSITION FRAME KIT CONTENTS**

MTF-LEO-M/LYON Transition Frame Kit, PN 40.215.250.01

	Quantity	Part Number	Item
	1	45.215.250.01	MTG-LEO-M/LYON transition frame
	4	134.025	5/16 x 0.875" quick-release pins (red button)
	4	134.051	7/16 x 1.50" quick-release pins (red button)

## MTF-LEO-M/LYON TRANSITION FRAME DIMENSIONS



MTF-LEO-M/LYON Transition Frame Dimensions

## MTF-LEO-M/LYON Transition Frame Weight: 85 lbs (38.6 kg)

## MTF-LEO-M/LYON TRANSITION FRAME LOAD RATINGS

With some restrictions, the MTF-LEO-M/LYON transition frame has the following load ratings:

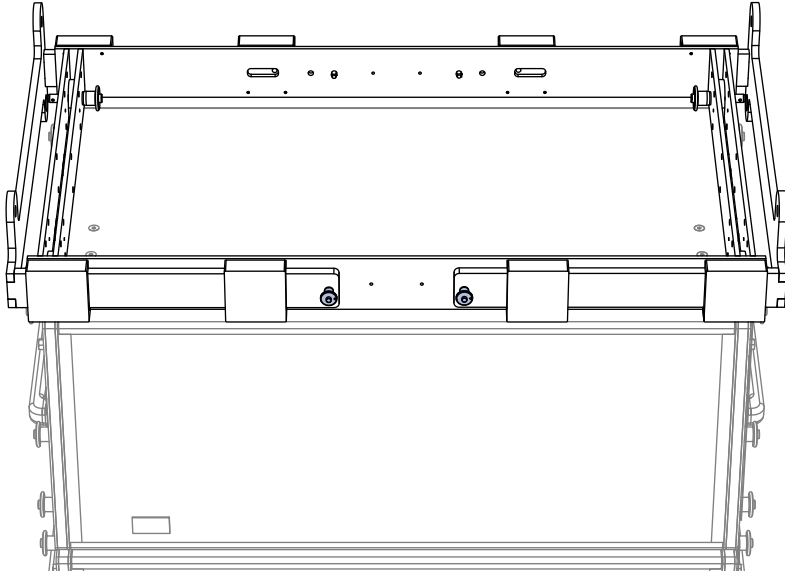
- 5:1 safety factor, eight LYONs
- 7:1 safety factor, seven LYONs



**CAUTION:** The LEO-M array configuration greatly effects the load ratings for the attached MTF-LEO-M/LYON transition frame. In addition, the number of LYONs flown below a LEO-M array greatly affects the load rating for the MTG-LEO-M top grid. For more information, see “MTG-LEO-M Top Grid Load Ratings with Downfill LYONs” on page 19.

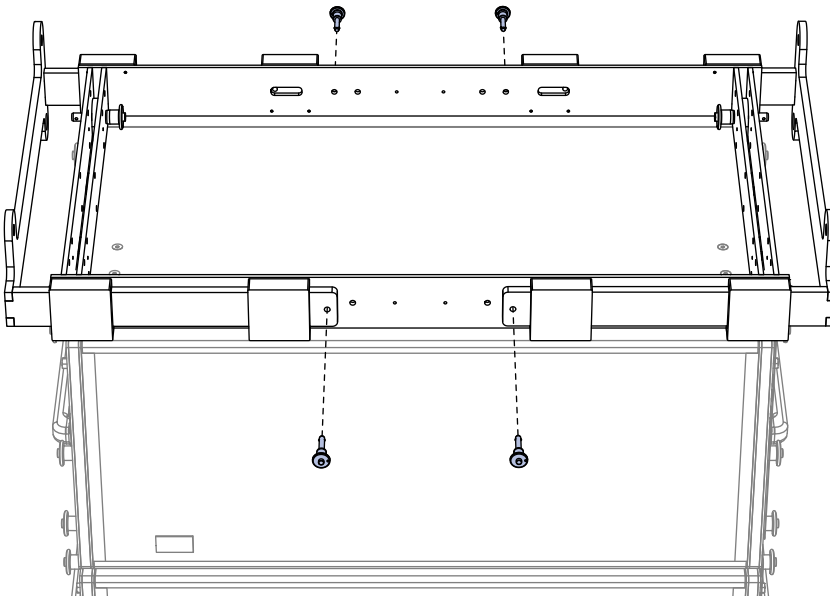
## COLLAPSING THE MTF-LEO-M/LYON TRANSITION FRAME

The MTF-LEO-M/LYON transition frame collapses horizontally so it can travel installed on top of LYON stacks in the MCF-LYON caster frame. When the transition frame is collapsed, it occupies the same footprint as the MCF-LYON caster frame.



*MTF-LEO-M/LYON Transition Frame Collapsed*

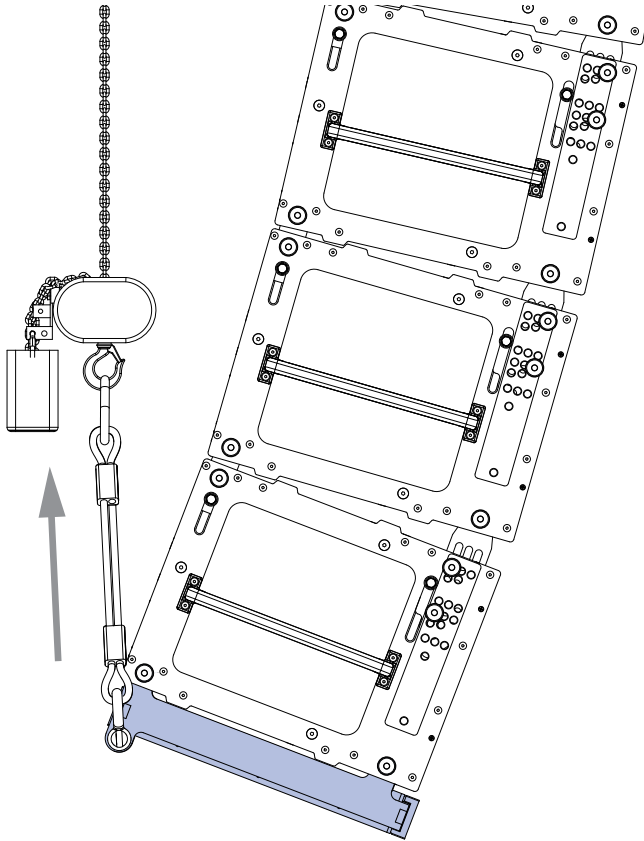
Before attaching the MTF-LEO-M/LYON transition frame to a LEO-M array, simply expand the frame and lock it with the four included 5/16 x 0.857-inch quick-release pins (red button).



*MTF-LEO-M/LYON Transition Frame Expanded*

## USING THE MTF-LEO-M/LYON TRANSITION FRAME FOR PULL-BACK AND PULL-UP

The MTF-LEO-M/LYON transition frame includes two rear pickup points that provide pull-back for extreme array downtilts. The pickup points can also be used for pull-up to expand the array's splay angles during installation so the blue locking pins can be more easily inserted. The MTF-LEO-M/LYON transition frame requires 5/8-inch shackles for its pickup points.



MTF-LEO-M/LYON Transition Frame with Pull-Back

- When the PBF-LEO-M is used for **pull-back**, to tilt the array, the frame must be pulled by a motor separate from (and usually behind) the MTG-LEO-M top grid. The pull-back motor must *not* be attached to the top grid.

**CAUTION:** When configuring arrays with pull-back, when in final position, the pull-back chain should not be greater than  $\pm 30$  degrees from vertical.

- When the PBF-LEO-M is used for **pull-up**, to expand the array's splay angles during installation so the blue locking pins can be inserted, the frame is pulled by a motor placed between the frame and the RPP-LEO-M rear pull-up plate (attached to the MTG-LEO-M top grid). For more information, see Chapter 9, "RPP-LEO-M Rear Pull-Up Plate."

**CAUTION:** When flying combined arrays, the total weight of the arrays and transition and pull-back hardware should be calculated, before the arrays are flown, to verify that the weight does not exceed the load ratings for the MTG-LEO-M top grid (see "MTG-LEO-M Top Grid Load Ratings" on page 19).

**CAUTION:** Always use properly rated rigging hardware. The MTF-LEO-M/LYON transition frame requires 5/8-inch shackles for its pickup points.


**CAUTION:** The PBF-LEO-M pull-back frame should not be used with the MTF-LEO-M/LYON transition frame. The MTF-LEO-M/LYON transition frame has its own attachment points for pull-back and pull-up.

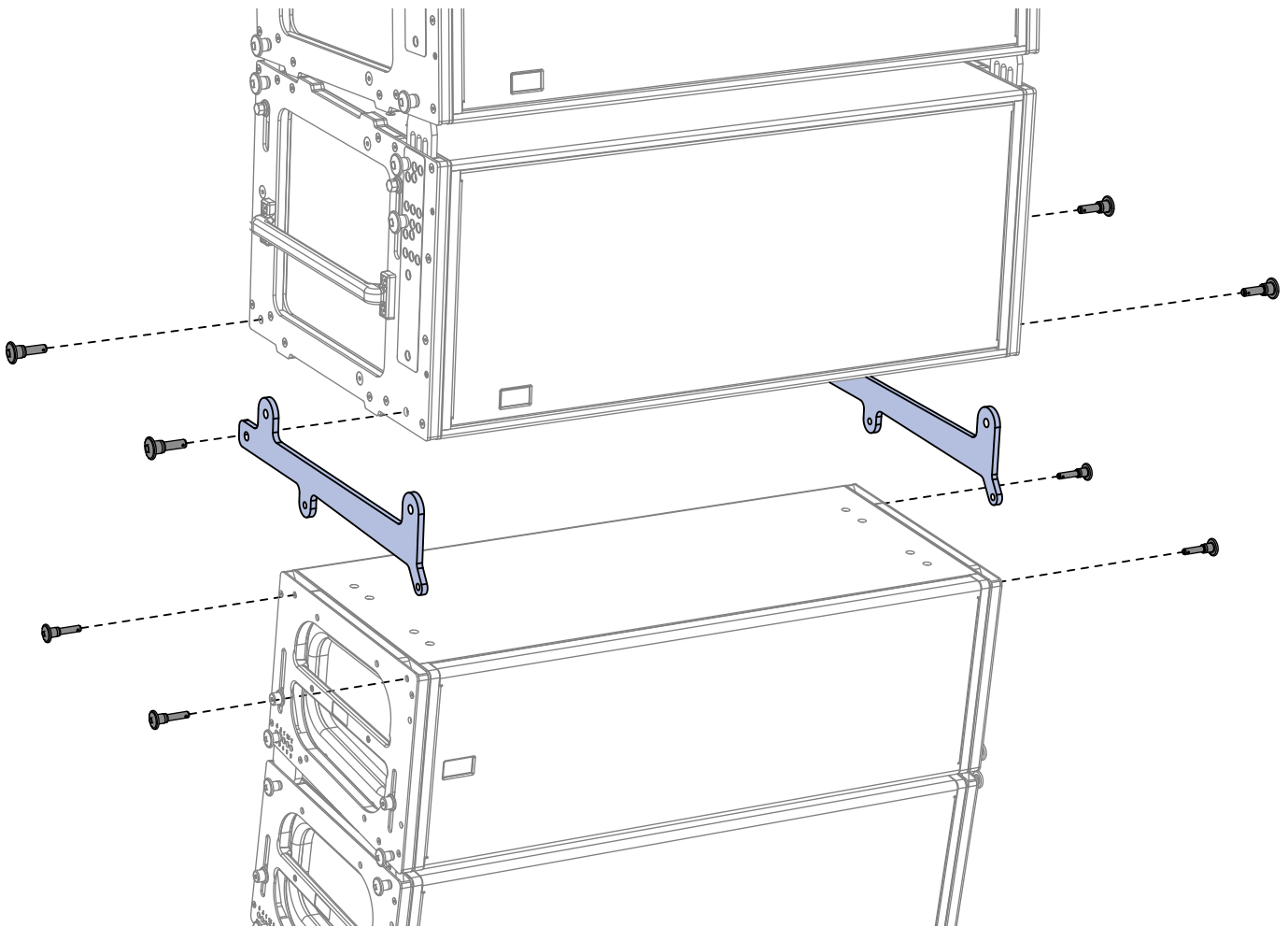





## CHAPTER 7: MTF-LEO-M/MICA TRANSITION FRAME

The MTF-LEO-M/MICA transition frame flies up to eight MICA loudspeakers at a 7:1 safety factor below LEO-M arrays for downfill. The MTF-LEO-M/MICA transition frame kit is comprised of two transition bars that attach to the bottom cabinet in the LEO-M array and the top cabinet in the MICA array. The top MICA cabinet attaches at a fixed splay angle of 3 degrees. The MTF-LEO-M/MICA transition frame is secured to the LEO-M and MICA cabinets with the quick-release pins included with those loudspeakers.

 **CAUTION:** When flying combined arrays, the total weight of the arrays and transition and pull-back hardware should be calculated, before the arrays are flown, to verify that the weight does not exceed the load ratings for the MTG-LEO-M top grid (see “MTG-LEO-M Top Grid Load Ratings” on page 19).

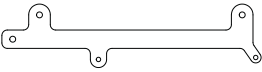


*MTF-LEO-M/MICA Transition Frame with MICAs flown by LEO-M Array*

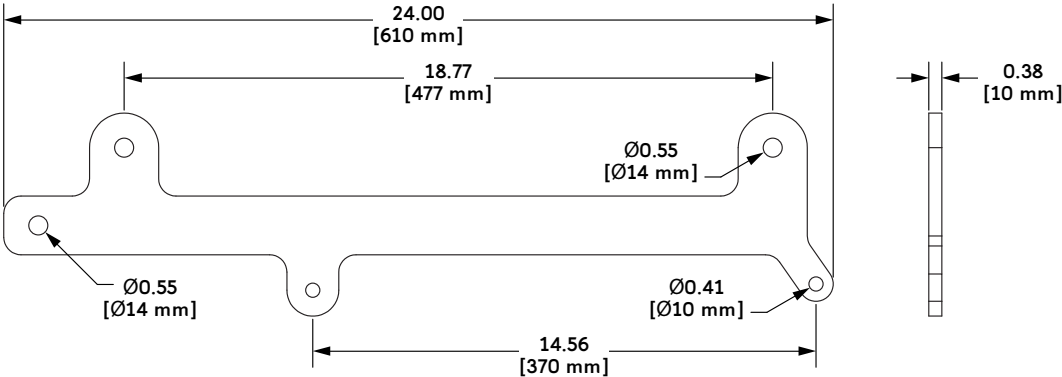
 **NOTE:** The MTF-LEO-M/MICA transition frame is required when using the PBF-LEO-M pull-back frame to adjust the array's downtilt angle (with or without MICAs). For more information, see Chapter 8, “PBF-LEO-M Pull-Back Frame.”

MTF-LEO-M/MICA TRANSITION FRAME KIT CONTENTS

MTF-LEO-M/MICA Transition Frame Kit, PN 40.215.131.01

	Quantity	Part Number	Item
	2	61.215.131.01	MTF-LEO-M/MICA transition bars

MTF-LEO-M/MICA TRANSITION BAR DIMENSIONS




MTF-LEO-M/MICA Transition Bar Dimensions

MTF-LEO-M/MICA Transition Frame Weight: 9 lbs (4.1 kg)

MTF-LEO-M/MICA TRANSITION FRAME LOAD RATINGS

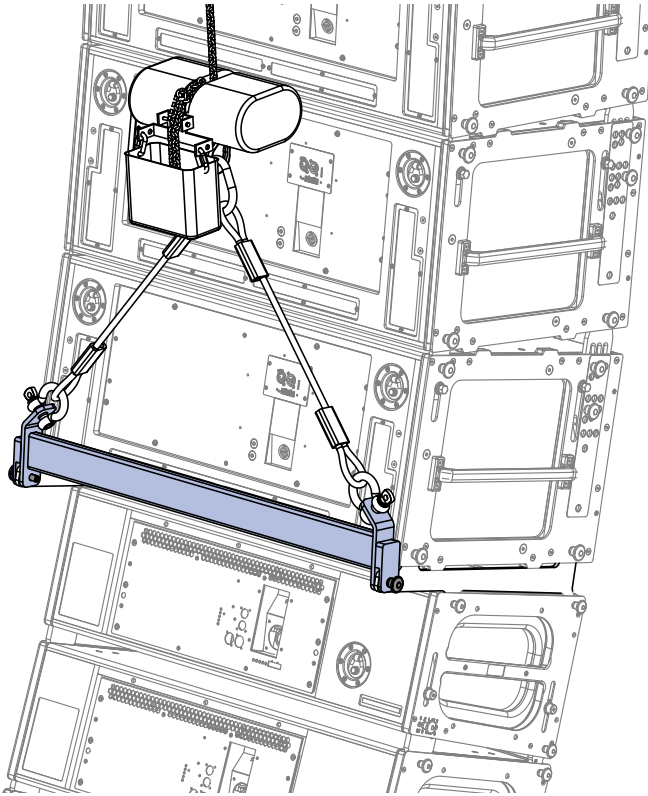
With some restrictions, the MTF-LEO-M/MICA transition frame has the following load ratings:

- 5:1 safety factor, six MICAs
- 7:1 safety factor, five MICAs

 **CAUTION:** The LEO-M array configuration greatly effects the load ratings for the attached MTF-LEO-M/MICA transition frame. In addition, the number of MICAs flown below a LEO-M array greatly affects the load rating for the MTG-LEO-M top grid. For more information, see “MTG-LEO-M Top Grid Load Ratings with Downfill MICAs” on page 20.

## CHAPTER 8: PBF-LEO-M PULL-BACK FRAME

The optional PBF-LEO-M pull-back frame attaches to the MTF-LEO-M/MICA transition frame and provides pull-back for extreme array downtilts. The pull-back frame can also be used for pull-up to expand the array's splay angles during installation so the blue locking pins can be more easily inserted. The PBF-LEO-M pull-back frame includes two 1/2 x 1.50-inch quick-release pins (red button) for securing the frame to the MTF-LEO-M transition frame. The PBF-LEO-M pull-back frame requires 5/8-inch shackles for its two pickup points.



*PBF-LEO-M Pull-Back Frame Attached to MTF-LEO-M Transition Frame*


- When the PBF-LEO-M is used for **pull-back**, to tilt the array, the frame must be pulled by a motor separate from (and usually behind) the MTG-LEO-M top grid. The pull-back motor must *not* be attached to the top grid.


⚠ **CAUTION:** When configuring arrays with pull-back, when in final position, the pull-back chain should not be greater than  $\pm 30$  degrees from vertical.

- When the PBF-LEO-M is used for **pull-up**, to expand the array's splay angles during installation so the blue locking pins can be more easily inserted, the frame is pulled by a motor placed between the frame and the RPP-LEO-M rear pull-up plate (attached to the MTG-LEO-M top grid). For more information, see Chapter 9, "RPP-LEO-M Rear Pull-Up Plate."

⚠ **CAUTION:** When flying combined arrays, the total weight of the arrays and transition and pull-back hardware should be calculated, before the arrays are flown, to verify that the weight does not exceed the load ratings for the MTG-LEO-M top grid (see "MTG-LEO-M Top Grid Load Ratings" on page 19).


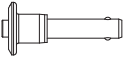
⚠ **CAUTION:** Always use the 1/2 x 1.50-inch quick-release pins (red button) included with the PBF-LEO-M pull-back frame to secure the frame to the MTF-LEO-M transition frame. Do not use the quick-release pins included with LEO-M as they are shorter and will not lock in place.

 **CAUTION:** Always use properly rated rigging hardware. The PBF-LEO-M pull-back frame requires 5/8-inch shackles for its pickup points.

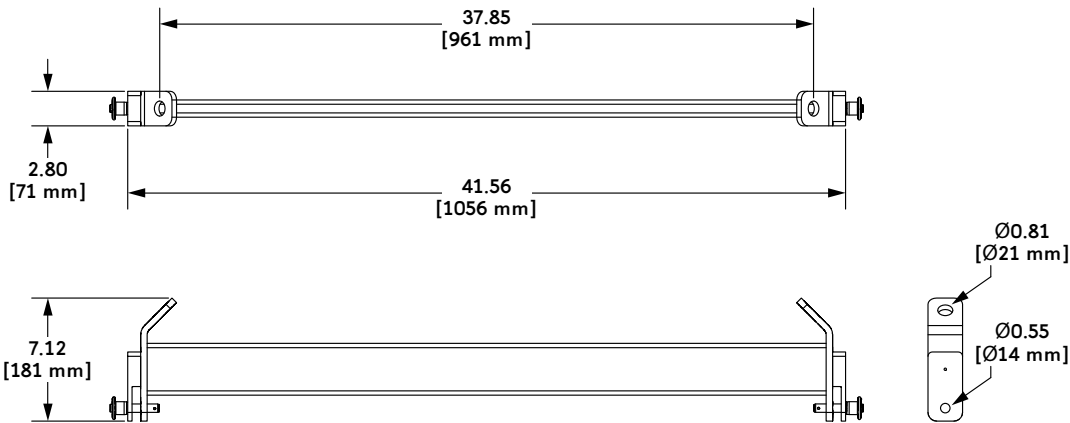
 **CAUTION:** The PBF-LEO-M pull-back frame should only be used with the MTF-LEO-M/MICA transition frame. It should not be used with the MTF-LEO-M/LYON transition frame, which has its own attachment points for pull-back and pull-up. For more information, see “Using the MTF-LEO-M/LYON Transition Frame for Pull-Back and Pull-Up” on page 35.

PBF-LEO-M PULL-BACK FRAME KIT CONTENTS

PBF-LEO-M Pull-Back Frame Kit, PN 40.215.136.01

	Quantity	Part Number	Item
	1	45.215.137.01	PBF-LEO-M pull-back frame
	2	134.045	1/2 x 1.50" quick-release pins (red button)

PBF-LEO-M PULL-BACK FRAME DIMENSIONS




PBF-LEO-M Pull-Back Frame Dimensions

PBF-LEO-M Pull-Back Frame Weight: 16 lbs (7.3 kg)

PBF-LEO-M PULL-BACK FRAME LOAD RATINGS

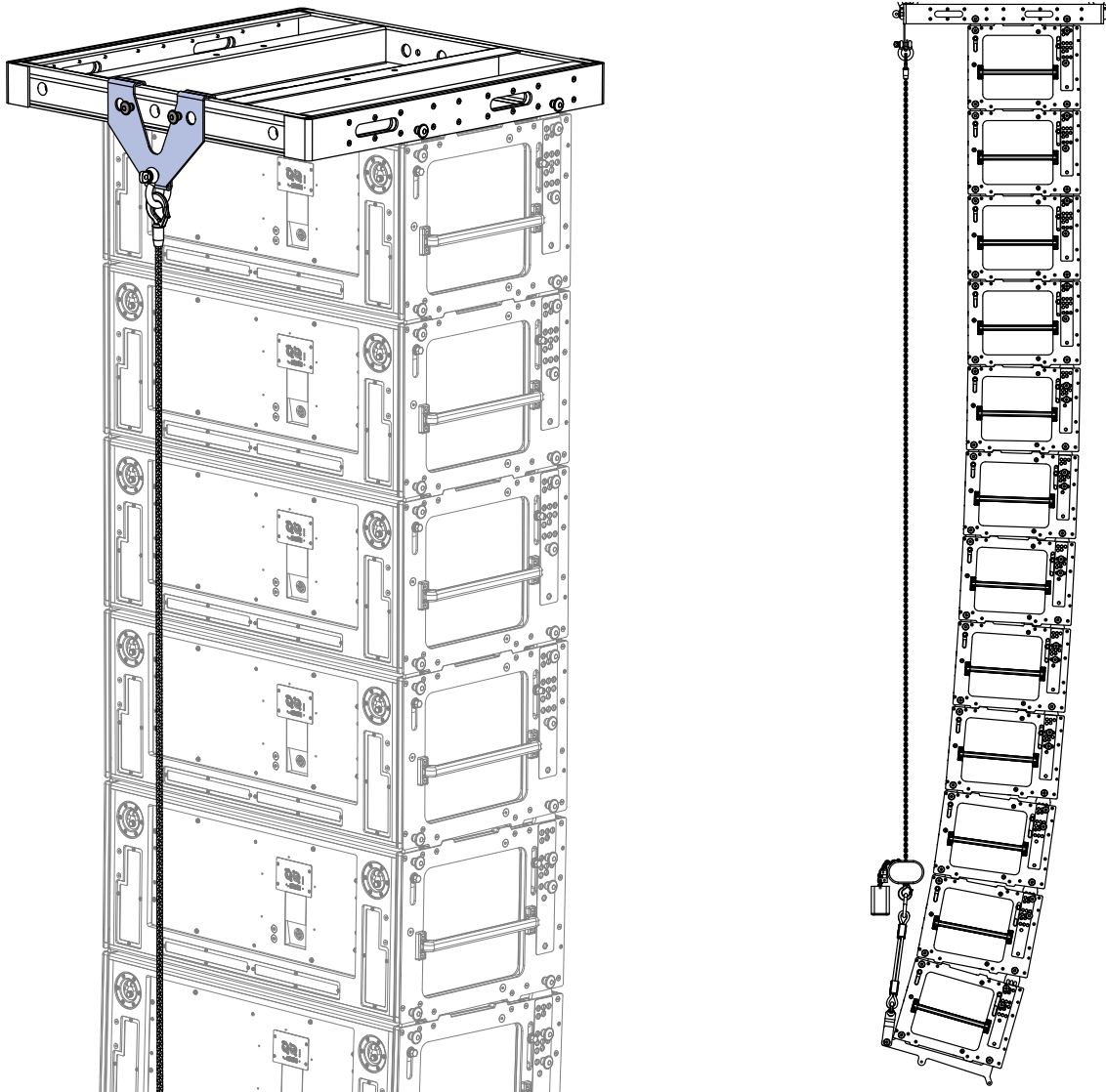
The PBF-LEO-M pull-back frame has the following load ratings:

- 7:1 safety factor, 1325 lbs (601 kg)
- 5:1 safety factor, 1855 lbs (841 kg)

 **CAUTION:** The minimum leg length for bridle attachments to the PBF-LEO-M pull-back frame is 27 inches (686 mm).

## CHAPTER 9: RPP-LEO-M REAR PULL-UP PLATE

The optional RPP-LEO-M rear pull-up plate helps assemble large flown arrays with wide splay angles. Flown arrays can be pulled up (with a motor) to expand splay angles so the blue locking pins can be more easily inserted. LEO-M stacks in caster frames can be pulled up and tilted to facilitate linking to flown arrays with severe downtilt (see “MCF-LEO-M Caster Frame Dimensions” on page 45). The pull-up motor should be 1/2 ton or smaller and placed between the pull-up plate and the PBF-LEO-M pull-back frame, MTF-LEO-M/LYON transition frame, or MCF-LEO-M caster frame. The RPP-LEO-M rear pull-up plate includes two 1/2 x 2.50-inch quick-release pins (blue button) for securing the plate to the MTG-LEO-M top grid. The RPP-LEO-M rear pull-up plate requires a 5/8-inch shackle for its single attachment point.



*RPP-LEO-M Rear Pull-Up Plate Attached to MTG-LEO-M Top Grid (Left) and MTF-LEO-M/MICA Transition Frame (Right)*



**CAUTION:** Use a 1/2 ton motor or smaller for pull-up with the RPP-LEO-M rear pull-up plate. Larger motors could damage cabinets and rigging hardware if pulled beyond their configured splay angles.



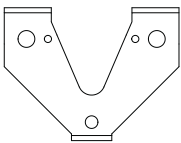
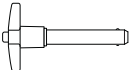
**CAUTION:** Always use the 1/2 x 2.50-inch quick-release pins (blue button) included with the RPP-LEO-M rear pull-up plate to secure the plate to the MTG-LEO-M top grid. Do not use the quick-release pins included with the MTG-LEO-M top grid, as they are shorter and will not lock in place.



**CAUTION:** Always use properly rated rigging hardware. The RPP-LEO-M rear pull-up plate requires a 5/8-inch shackle for its pickup point.

## RPP-LEO-M REAR PULL-UP PLATE KIT CONTENTS

RPP-LEO-M Rear Pull-Up Plate Kit, PN 40.215.181.01

	Quantity	Part Number	Item
	1	61.215.181.01	RPP-LEO-M rear pull-up plate
	2	134.007	1/2 x 2.50" quick-release pins (blue button)

**RPP-LEO-M Rear Pull-Up Plate Weight: 6 lbs (2.7 kg)**

## RPP-LEO-M REAR PULL-UP PLATE LOAD RATINGS

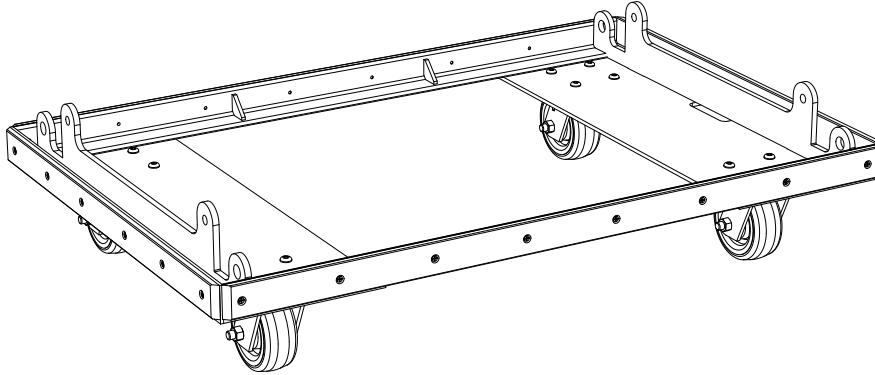
The RPP-LEO-M rear pull-up plate has the following load ratings:

- 7:1 safety factor, 1325 lbs (601 kg)
- 5:1 safety factor, 1855 lbs (841 kg)
- Maximum chain motor size, 1/2 ton

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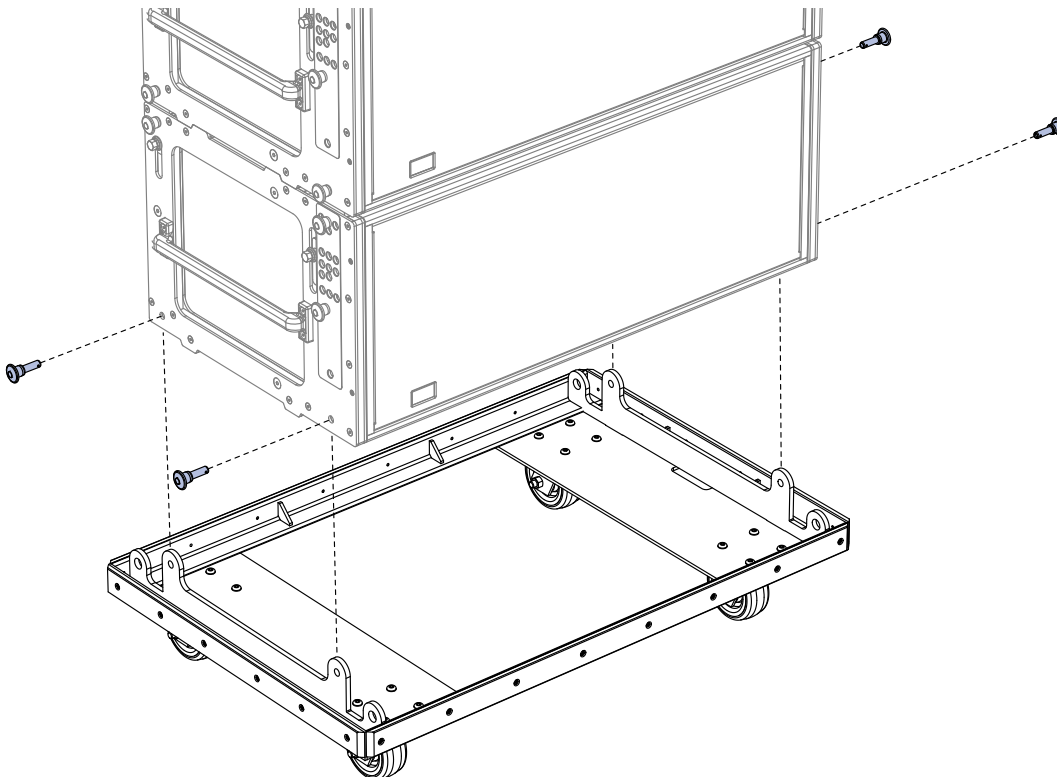
## CHAPTER 10: MCF-LEO-M CASTER FRAME

The MCF-LEO-M caster frame safely supports up to four LEO-Ms for transport, making it easy to assemble and disassemble arrays in blocks of four cabinets. The caster frame's sturdy construction allows it to be conveniently moved with forklifts.

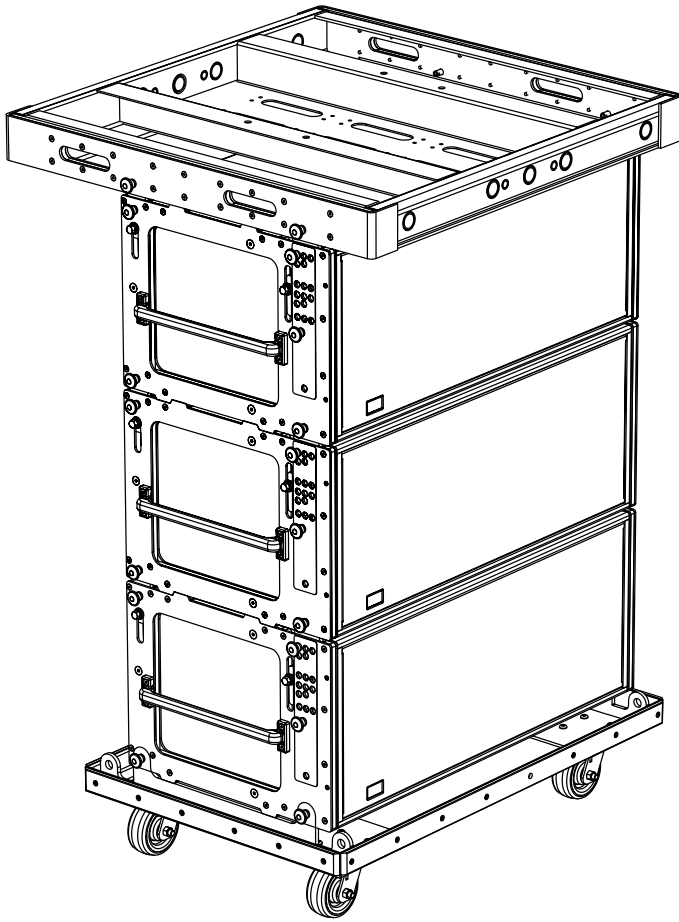


*MCF-LEO-M Caster Frame*

The caster frame includes four fixed, 0-degree links that attach to the LEO-M at the bottom of the stack and are secured with the 1/2 by 1.25-inch quick-release pins (blue button) included with LEO-M. The caster frame also includes front and rear pickup points that can be pulled by motors to adjust the tilt of the stack when linking to suspended arrays (see “MCF-LEO-M Caster Frame Dimensions” on page 45). The MCF-LEO-M caster frame requires 5/8-inch shackles for its pickup points.



*MCF-LEO-M Caster Frame with LEO-Ms*



MCF-LEO-M Caster Frame with LEO-M Stack



**TIP:** Durable nylon covers, sized for stacks of 2, 3, and 4 units, are available to ensure that LEO-M is completely road ready.



**TIP:** The MTG-LEO-M top grid can travel installed on top of LEO-M stacks in the MCF-LEO-M caster frame.



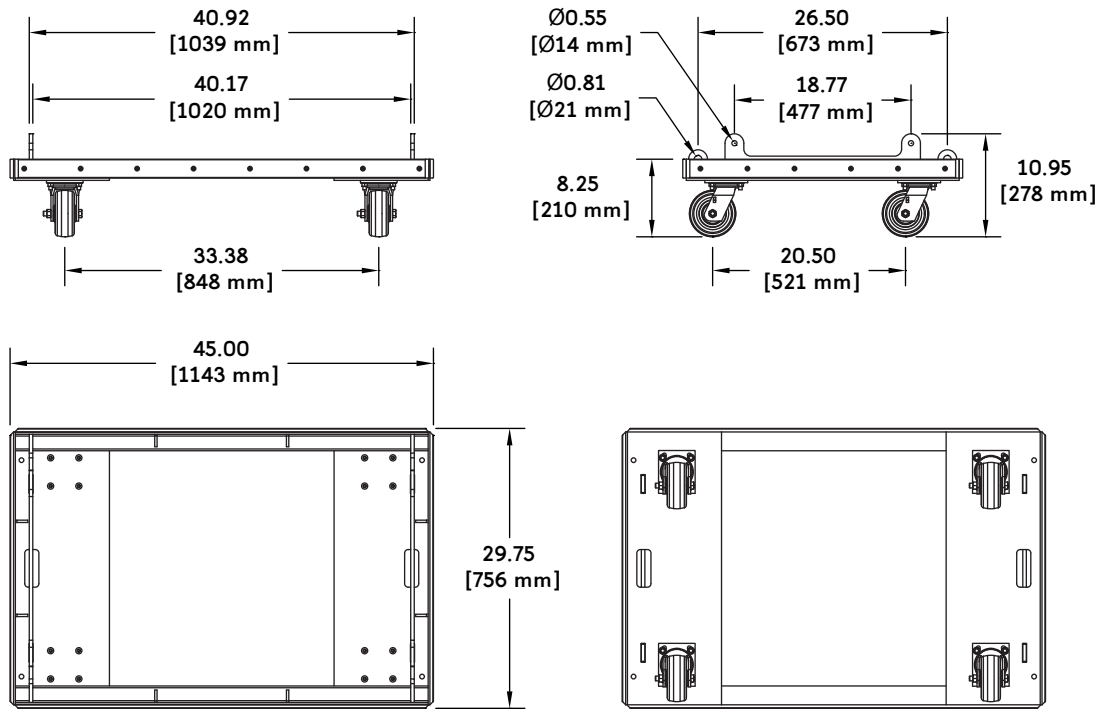
**TIP:** When transporting the MTG-LEO-M top grid on top of LEO-M stacks in the MCF-LEO-M caster frame and additional height is needed to avoid colliding with other LEO-M stacks, you can use the optional Wheel Frame Extension kit (PN 40.132.150.01) to raise the stack by 1 inch.



**TIP:** When adding LEO-M stacks to a suspended array with severe downtilt, you can use the RPP-LEO-M pull-up plate to attach a motor to the MCF-LEO-M caster frame, to pull up the rear of the stack so it can more easily be linked to the suspended array (see “MCF-LEO-M Caster Frame Dimensions” on page 45).



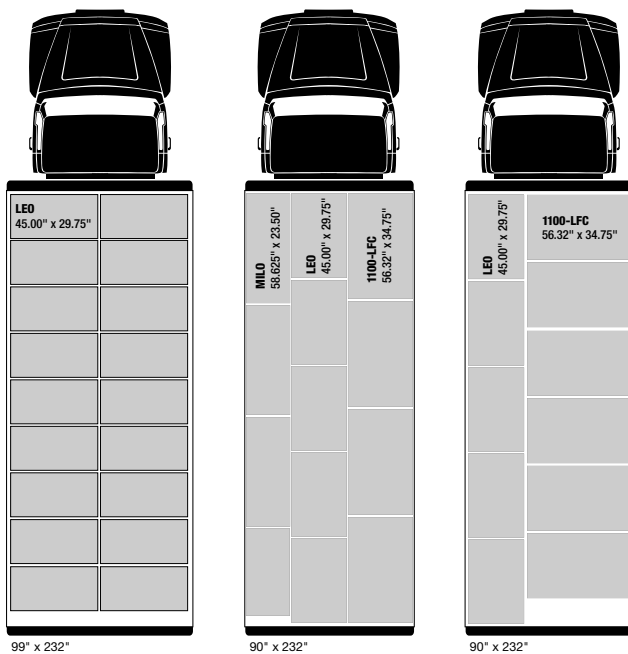
## MCF-LEO-M CASTER FRAME DIMENSIONS



MCF-LEO-M Caster Frame Dimensions

**MCF-LEO-M Caster Frame Weight: 110 lbs (49.9 kg)**

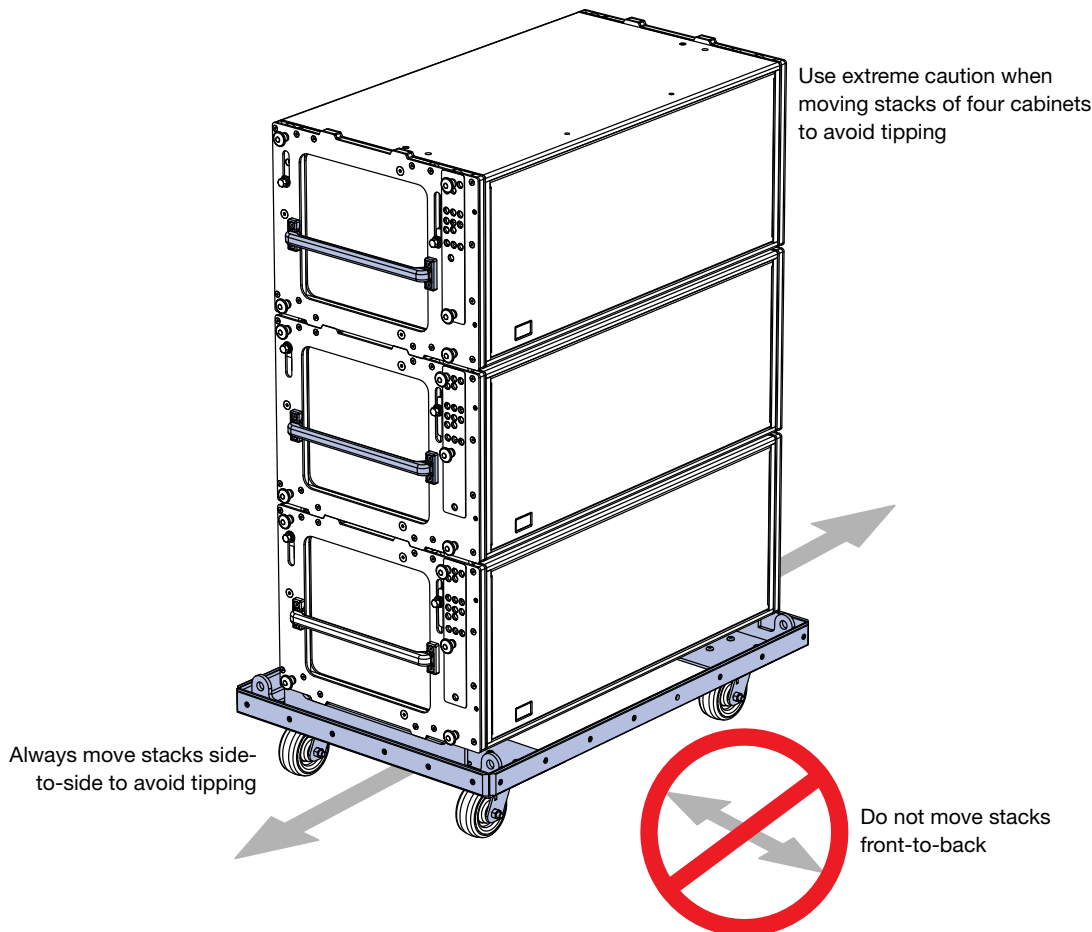
## MCF-LEO-M TRUCK PACKING EXAMPLES



MCF-LEO-M Truck Packing Configurations

## SAFETY GUIDELINES FOR THE MCF-LEO-M CASTER FRAME

- Do not stack more than four LEO-Ms in the MCF-LEO-M caster frame.
- While the MCF-LEO-M supports up to four cabinets, three cabinets are recommended for more stable transport. Exercise extreme caution when moving stacks of four cabinets with the caster frame to avoid tipping.
- Do not move stacks in the front-to-back direction of the LEO-Ms (the long side); always move stacks sideways to avoid tipping.



- To avoid tipping, transport stacks with LEO-Ms linked and locked at 0-degree splay angles. For more information, see “Configuring GuideALinks for Transport” on page 14.
- When lifting a LEO-M stack with a forklift, always keep the forks wide and close to the caster frame’s wheels. Failing to do so may bend the caster frame or cause the stack to tip.
- The caster frame must be removed before flying the array.

## USING PULL-UP TO TILT THE MCF-LEO-M CASTER FRAME

When adding LEO-M stacks to a suspended array with severe downtilt, you can use the optional RPP-LEO-M pull-up plate to attach a motor (1/2 ton or smaller) to the caster frame, to pull up and tilt the stack so it can more easily be linked to the suspended array. The MCF-LEO-M caster frame requires 5/8-inch shackles for its pickup points.

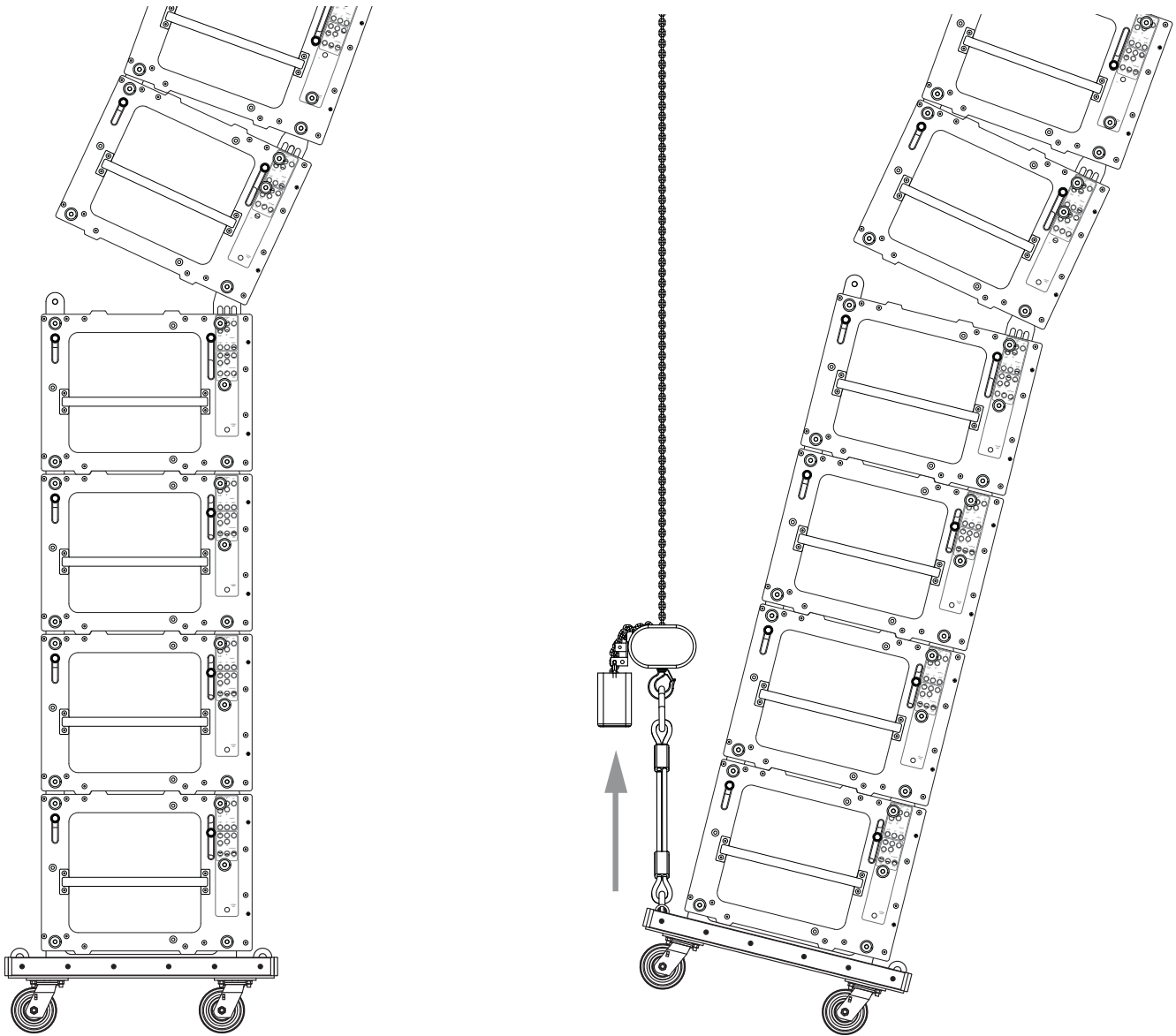


Figure 2: Building Array with RPP-LEO-M Pull-Up Plate and Motor Attached to MCF-LEO-M Caster Frame (Right)



**CAUTION:** Use a 1/2 ton motor or smaller for pull-up with the RPP-LEO-M rear pull-up plate. Larger motors could damage cabinets and rigging hardware if pulled beyond their configured splay angles.



**CAUTION:** Always use properly rated rigging hardware. The MCF-LEO-M caster frame requires 5/8-inch shackles for its pickup points.



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## APPENDIX A: ASSEMBLING ARRAYS WITH THE MTG-LEO-M TOP GRID

To assemble a LEO-M array with the MTG-LEO-M top grid:

1. Attach the MTG-LEO-M top grid to the motors:

- Place the MTG-LEO-M on the floor or on a road trunk in the approximate location where the rigging points have been established and the motors have been hung.
- Attach 7/8-inch shackles to the desired pickup points on the MTG-LEO-M (see “MTG-LEO-M Pickup Configurations” on page 25).



**NOTE:** A 2-foot length of wire rope, or deck chain, placed between the shackles and the motor's chain hooks is recommended to prevent the chain bags from getting in the way of the top loudspeaker.

- Lower the motors and attach the chain hooks to the 7/8-inch shackles.
- Raise the grid slightly higher than the first stack of LEO-M loudspeakers to be linked.

2. Link the MTG-LEO-M top grid to the first LEO-M stack:

- Roll the MCF-LEO-M caster frame with the first LEO-M stack into position under the grid. Up to four LEO-M loudspeakers can be safely transported with the caster frame. Make sure the GuideALinks for the top cabinet have been retracted and stowed.
- Lower the grid so it is 1–3 inches above the top cabinet in the stack. Adjust the placement of the stack on the floor so the top cabinet's GuideALinks align with the grid's link slots. Extend the front GuideALinks from the top cabinet into the grid's link slots and secure them with the 1/2 x 1.50-inch quick-release pins (red button) included with the grid. Lower the grid so it touches the top cabinet. The front GuideALinks keep the grid aligned to the cabinet. Extend the rear GuideALinks into the grid and secure them with the 1/2 x 1.50-inch quick-release pins (red button) included with the grid.
- Make sure each cabinet in the stack is pinned to the cabinet above it with the 1/2 x 1.25-inch LEO-M quick-release pins (blue button).
- Set the splay angles for the cabinets by inserting quick-release pins in the yellow ANGLE positions. Available angles are 0.0, 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 4.0, and 5.0 degrees. Use the 1/2 x 1.25-inch LEO-M quick-release pins (blue button).
- Remove the quick-release pins from the blue LOCKING positions and insert them temporarily in the STOW PIN position. This will allow the splay angles to extend when the stack is lifted.



**TIP:** Resist the urge to put the blue locking pins in your pocket. Instead place them in the STOW PIN position before lifting or lowering the array.

- Raise the grid so the loudspeakers are suspended slightly off the floor and remove the two rear quick-release pins securing the caster frame to the bottom cabinet. 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. Return the four quick-release pins to the bottom cabinet. Roll away the empty caster frame.
- Lock the splay angles for the cabinets by removing the quick-release pins from the STOW PIN position and inserting them in the blue LOCKING positions. The pins should match those in the yellow ANGLE positions. Use the 1/2 x 1.25-inch LEO-M quick-release pins (blue button).



**TIP:** When inserting quick-release pins in the blue LOCKING positions (for splay angles of 0.5, 1.0, 1.5, 2.0, 3.0, 4.0, and 5.0 degrees), a good visual clue is to make sure they are located three holes below those of the corresponding yellow ANGLE positions.

- Attach the AC power, audio, and RMS cables to the new loudspeaker stack.

- Raise the grid so the suspended loudspeakers are slightly higher than the next stack of LEO-Ms to be linked.
3. Link the suspended LEO-Ms to the next stack in the array:
- Roll the next stack of LEO-Ms into position under the suspended loudspeakers. Make sure the GuideALinks for the top cabinet in the new stack have been retracted and stowed.



**CAUTION:** If the GuideALinks are not stowed as described in this step, you may damage the bottom of the suspended cabinet when lowering it.

- Lower the suspended loudspeakers so the bottom cabinet is 1–3 inches above the top cabinet on the floor. Adjust the placement of the stack on the floor so the top cabinet's GuideALinks align with the link slots of the suspended cabinet above it. Extend the front GuideALinks from the top cabinet into the link slots of the suspended cabinet above it and secure them with the 1/2 x 1.25-inch LEO-M quick-release pins (blue button).
  - Lower the suspended loudspeakers so the bottom cabinet touches the cabinet on the floor. The front GuideALinks keep the cabinets aligned. Extend the rear GuideALinks into the suspended cabinet and secure them with the 1/2 x 1.25-inch LEO-M quick-release pins (blue button).
  - Make sure each cabinet in the stack on the floor is pinned to the cabinet above it with the 1/2 x 1.25-inch LEO-M quick-release pins (blue button).
  - Set the splay angles for the cabinets by inserting quick-release pins in the yellow ANGLE positions. Available angles are 0.0, 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 4.0, and 5.0 degrees. Use the 1/2 x 1.25-inch LEO-M quick-release pins (blue button).
  - Remove the quick-release pins from the blue LOCKING positions and insert them temporarily in the STOW PIN position. This will allow the splay angles to extend when the stack is lifted.
  - Raise the grid so the loudspeakers are suspended slightly off the floor and remove the two rear quick-release pins securing the caster frame to the bottom cabinet. 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. Return the four quick-release pins to the bottom cabinet. Roll away the empty caster frame.
  - Lock the splay angles for the cabinets by removing the quick-release pins from the STOW PIN position and inserting them in the blue LOCKING positions. The pins should match those in the yellow ANGLE positions. Use the 1/2 x 1.25-inch LEO-M quick-release pins (blue button).
  - Attach the AC power, audio, and RMS cables to the new loudspeaker stack.
  - Raise the grid so the suspended loudspeakers are slightly higher than the next stack of LEO-Ms to be linked.
4. Repeat the previous steps until the entire array has been assembled. All loudspeaker-to-loudspeaker links should be secured with the 1/2 x 1.25-inch LEO-M quick-release pins (blue button).



**NOTE:** As loudspeakers are added to the suspended array, try to keep the bottom cabinet parallel to the stage, by lowering the rear motors, to ease the process of adding more loudspeakers to the array. In some cases, when the array length is longer than 10–12 loudspeakers, it may be necessary to push the suspended array downstage and lower the array to close the gap between the rear of the flown and stacked loudspeakers.



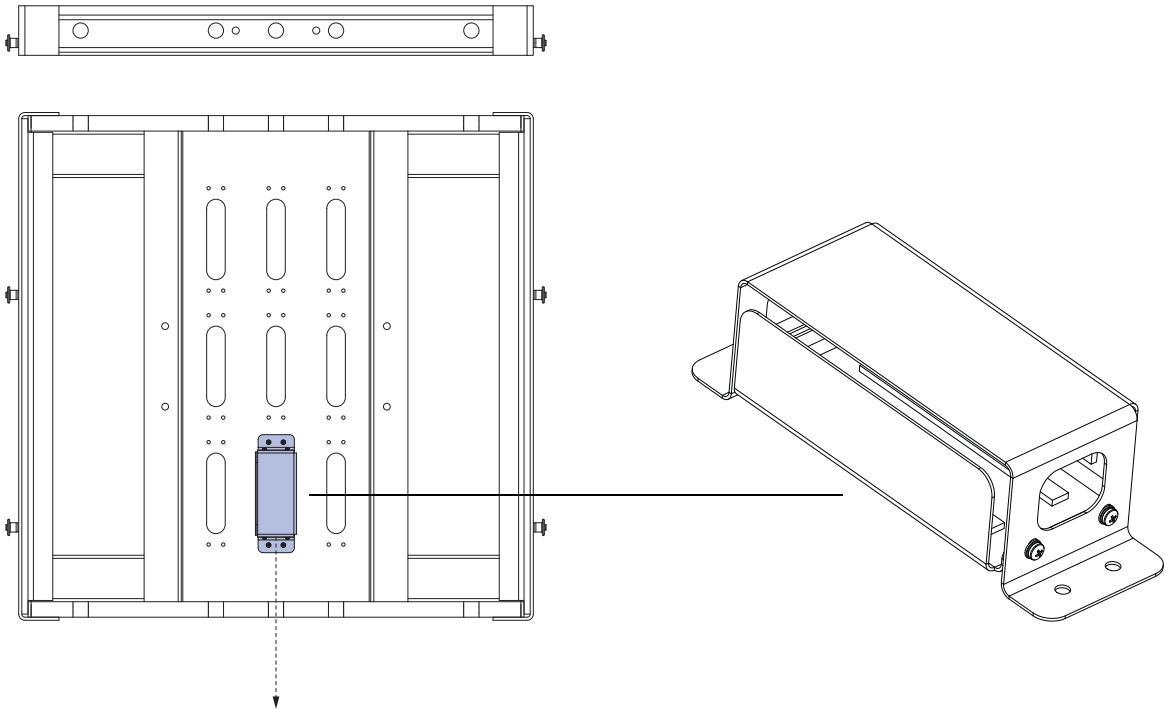
**TIP:** You can use the RPP-LEO-M pull-up plate to pull up and tilt an MCF-LEO-M caster frame, to facilitate linking its stack to a suspended array with severe downtilt. For more information, see “MCF-LEO-M Caster Frame Dimensions” on page 45.



**CAUTION:** Do not lift a LEO-M stack until all four GuideALinks have been pinned for each cabinet. Failing to do so could damage the GuideALinks for the linked units.

# APPENDIX B: LASER BRACKET

A laser bracket is available from Meyer Sound that mounts third-party inclinometers and lasers (such as the SSE ProSight laser) on the MTG-LEO-M top grid. These devices facilitate aiming the array and verifying its hanging angle. The MTG-LEO-M top grid offers the flexibility of nine mounting positions for the laser bracket so it won't conflict with center attachment points, the MVP motor Vee plate, or the RPP-LEO-M rear pull-up plate. The laser shines through one of three center holes in the front or rear of the grid.







MTG-LEO-M Top Grid with Laser Bracket



**NOTE:** The laser bracket must be installed before loudspeakers are flown from the grid. Install the included panhead screws from the bottom up with the threads oriented up. Use the included flat washers to avoid scratching the grid.

## Laser Bracket Kit Contents

PN 40.215.152.01

	Quantity	Part Number	Item
	1	45.215.152.01	ProSight laser bracket assembly
	4	101.544	10-32 X 0.75" panhead screws
	4	109.521	10-32" hex nuts
	8	113.519	Flat washers







Meyer Sound Laboratories, Inc. www.meyersound.com  
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Berkeley, CA 94702 Phone: +1 510.486.1166  
USA Fax: +1 510.486.8356

Meyer Sound Germany GmbH www.meyersound.de  
Horresser Berg 4a sales@meyersound.de  
D-56410 Montabaur T: +49 2602 99908-0  
Germany F: +49 2602 99908-99

**EU Declaration of Conformity** Within the meaning of the EC Machinery  
Directive 2006/42/EC, EN ISO 17050-1

**Product Identification**

Cat. Number Product names  
40.215.114.01 MTG-LEO-M GRID  
40.215.136.01 PBF-LEO-M PULL BACK FRAME  
40.215.184.01 MVP-LEO-M MOTOR VEE PLATE  
40.215.131.01 MTF-LEO-M/MICA TRANSITION FRAME  
40.215.181.01 RPP-LEO-M REAR PULLUP PLATE  
40.215.023.01 LEO-M LF RIGGING FRAME REPLACEMENT KIT  
40.215.024.01 LEO-M RT RIGGING FRAME REPLACEMENT KIT  
Brand : Meyer Sound Laboratories  
Batch/Serial Nr : See Batch or Serial Number on Item  
For use with LEO-M SERIES Loudspeaker factory rigging.

**Manufacturer**

Name : Meyer Sound Laboratories  
Address : 2832 San Pablo Ave  
Berkeley California 94702  
Country : United States of America  
Representative : Meyer Sound Lab. GmbH

**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 products listed are in conformity with the essential requirements and provisions of Council Machine Directive 2006/42/EC SAFETY OF MACHINERY by means of type testing, and conformity with National standards and technical specifications applied, in particular: EN 292, DIN 18800, BGV C1. Professional installation is required in accordance with provided Operating Instructions and QuickFly™ Rigging System Installation manual.

Signed

Dated

11/26/2013

Name : Ms. Margie Garza, Director of Quality  
Place and date : Berkeley, California, USA. on November 26, 2013.



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Germany F: +49 2602 99908-99

**EU Declaration of Conformity** Within the meaning of the EC Machinery  
Directive 2006/42/EC, EN ISO 17050-1

**Product Identification**

Cat. Number Product names  
40.232.038.01 MTG-LYON GRID KIT  
40.232.125.01 PBF-LYON PULL BACK BAR KIT  
40.215.250.01 MTF-LEO/LYON TRANSITION FRAME KIT

Brand : Meyer Sound Laboratories  
Batch/Serial Nr : See Batch or Serial Number on Item  
For use with LYON SERIES Loudspeaker factory rigging.

**Manufacturer**

Name : Meyer Sound Laboratories  
Address : 2832 San Pablo Ave  
Berkeley California 94702  
Country : United States of America  
Representative : Meyer Sound Lab. GmbH

**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 products listed are in conformity with the essential requirements and provisions of Council Machine Directive 2006/42/EC SAFETY OF MACHINERY by means of type testing, and conformity with National standards and technical specifications applied, in particular: EN 292, DIN 18800, BGV C1. Professional installation is required in accordance with provided Operating Instructions and QuickFly™ Rigging System Installation manual.

Signed

Dated

5/05/2014

Name : Ms. Margie Garza, Director of Quality  
Place and date : Berkeley, California, USA. on May 5, 2014.



thinking sound



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MTG-LEO-M Top Grid Assembly Guide, PN 05.215.049.01 A