ULTRA-X40™ Wide Coverage Loudspeaker
ULTRA-X42™ Controlled Coverage Loudspeaker

Meyer
Sound®

THINKING SOUND

IMPORTANT SAFETY INSTRUCTIONS

These symbols indicate important safety or operating features in this booklet and on the frame or chassis:

SYMBOLS USED

Dangerous voltages: risk of electric shock	Important operating instructions	Replaceable Fuse	Protective earth ground	Hot surface: do not touch
Gefährliche Spannungen: Stromschlaggefahr	Hinweis auf wichtige Punkte der Betriebsanleitung	Austauschbare Sicherung	Schutzerde	Heiße Oberfläche: nicht berühren
Pour indiquer les risques résultant de tensions dangereuses	Instructions d'utilisation importantes	Fusible remplaçable	Terre de protection	Surface chaude: ne pas toucher
Para indicar voltajes peligrosos	Instrucciones importantes de funcionamiento y/o Mantenimiento	Fusible reemplazable	Toma de tierra de protección	Superficie caliente: no tocar

1. Read these instructions.

2. Keep these instructions.

3. Heed all warnings.

4. Follow all instructions.

5. Do not use this apparatus near water.

6. Clean only with dry cloth.

7. Do not block any ventilation openings. Install in accordance with Meyer Sound's installation instructions.

8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus that produce heat.

9. Do not defeat the safety purpose of the grounding-type plug. A grounding type plug has two blades and a third grounding prong. The third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.

10. Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles, and the point where they exit from the apparatus. The AC mains plug or appliance coupler shall remain readily accessible for operation.

11. Only use attachments/accessories specified by Meyer Sound.

12. Use only with the caster rails or rigging specified by Meyer Sound, or sold with the apparatus. Handles are for carrying only.

13. Unplug this apparatus during lightning storms or when unused for long periods of time.

14. If equipped with an external fuse holder, the replaceable fuse is the only user-serviceable item. When replacing the fuse, only use the same type and the same value.

15. Refer all other servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as when the power-supply cord or plug has been damaged; liquid has been spilled or objects have fallen into the apparatus; rain or moisture has entered the apparatus; the apparatus has been dropped; or when for undetermined reasons the apparatus does not operate normally.

WARNING: To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture. Do not install the apparatus in wet or humid locations without using weather protection equipment from Meyer Sound.

WARNING: Class I apparatus shall be connected to a mains socket outlet with a protective earthing connection.

CAUTION: Disconnect the mains plug before disconnecting the power cord from the loudspeaker.

English

- To reduce the risk of electric shock, disconnect the apparatus from the AC mains before installing audio cable. Reconnect the power cord only after making all signal connections.

- Connect the apparatus to a two-pole, three-wire grounding mains receptacle. The receptacle must be connected to a fuse or circuit breaker. Connection to any other type of receptacle poses a shock hazard and may violate local electrical codes.

- Do not install the apparatus in wet or humid locations without using weather protection equipment from Meyer Sound.

- Do not allow water or any foreign object to get inside the apparatus. Do not put objects containing liquid on or near the unit.

- To reduce the risk of overheating the apparatus, avoid exposing it to direct sunlight. Do not install the unit near heat-emitting appliances, such as a room heater or stove.

- If equipped with an external fuse holder, the replaceable fuse is the only item that can be serviced by the user. When replacing the fuse, only use the same type and value.

- This apparatus contains potentially hazardous voltages. Do not attempt to disassemble the unit. The only user-serviceable part is the fuse. All other repairs should be performed only by factory-trained service personnel.

Deutsch

- Zur Minimierung der Gefahr eines elektrischen Schlages trennen Sie das Produkt vor dem Anschluss von Audio-und/oder Steuerleitungen vom Stromnetz. Das Netzkabel darf erst nach Herstellung aller Signalverbindungen wieder eingesteckt werden.

- Das Produkt an eine vorschriftsgemäss installierte dreipolige Netzsteckdose (Phase, Neutralleiter, Schutzleiter) anschließen. Die Steckdose muss vorschriftsgemäß mit einer Sicherung oder einem Leitungsschutzschalter abgesichert sein. Das Anschließen des Produkts an eine anders ausgeführte Stromversorgung kann gegen Vorschriften verstossen und zu Stromunfällen führen.

- Das Produkt nicht an einem Ort aufstellen, an dem es direkter Wassereinwirkung oder übermäßig hoher Luftfeuchtigkeit ausgesetzt werden könnte, solange es sich nicht um ein Produkt handelt, dass mit der Meyer Sound Weather Protection Option ausgestattet ist.

- Vermeiden Sie das Eindringen von Wasser oder Fremdkörpern in das Innere des Produkts. Stellen Sie keine Objekte, die Flüssigkeit enthalten, auf oder neben dem Produkt ab.

- Um ein Überhitzen des Produkts zu verhindern, halten Sie das Gerät von direkter Sonneneinstrahlung fern und stellen Sie es nicht in der Nähe von wärmeabstrahlenden Geräten (z.B. Heizgerät oder Herd) auf.

- Bei Ausstattung mit einem externen Sicherungshalter ist die austauschbare Sicherung das einzige Gerät, das vom Benutzer gewartet werden kann. Verwenden Sie beim Austausch der Sicherung nur den gleichen Typ und Wert.

- Dieses Gerät enthält möglicherweise gefährliche Spannungen. Versuchen Sie nicht, das Gerät zu zerlegen. Der einzige vom Benutzer zu wartende Teil ist die Sicherung. Alle anderen Reparaturen dürfen nur von im Werk geschultem Servicepersonal ausgeführt werden.

Français

- Pour éviter tout risque d'électrocution, débranchez l'enceinte de la prise secteur avant de mettre en place le câble audio.Ne rebranchez le cordon secteur qu'après avoir procédé à toutes les connexions de signal audio

- Brancher l'appareil sur une prise secteur à trois fils et deux pôles avec mise à la terre. La prise doit être reliée à un fusible ou à un disjoncteur. Le branchement à tout autre type de prise présente un risque de choc électrique et peut enfreindre les codes locaux de l'électricité.

- N'installez pas l'enceinte dans des endroits humides ou en présence d'eau sans utiliser d'équipements de protection adéquats fournis par Meyer Sound.

- Ne laissez pas d'eau ou d'objet étranger, quel qu'il soit, pénétrer à l'intérieur de l'enceinte. Ne posez pas d'objet contenant du liquide sur ou à proximité de l'enceinte.

- Pour réduire les risques de surchauffe, évitez d'exposer directement l'enceinte aux rayons du soleil. Ne l'installez pas à proximité de sources de chaleur, radiateur ou four par exemple.

- S'il est équipé d'un porte-fusible externe, le fusible remplaçable est le seul élément qui peut être réparé par l'utilisateur. Lors du remplacement du fusible, n'utilisez que le même type et la même valeur.

- Cet appareil contient des tensions potentiellement dangereuses. N'essayez pas de démonter l'appareil.Le fusible est la seule pièce réparable par l'utilisateur. Toutes les autres réparations doivent être effectuées uniquement par du personnel de maintenance formé en usine.

Español

- Para reducir el riesgo de descarga eléctrica, desconecte el aparato de la red eléctrica antes de instalar el cable de audio. Vuelva a conectar el cable de alimentación sólo después de realizar todas las conexiones de señal.

- Conecte el aparato a una toma de corriente de tres hilos y dos polos con conexión a tierra. El receptáculo debe estar conectado a un fusible o disyuntor. La conexión a cualquier otro tipo de receptáculo representa un riesgo de descarga eléctrica y puede violar los códigos eléctricos locales.

- No instale el aparato en lugares húmedos o mojados sin usar el equipo de protección contra intemperie de Meyer Sound.

- No permita que penetre agua u otros objetos extraños en el interior del aparato. No coloque objetos que contengan líquido sobre o cerca de la unidad.

- Para reducir el riesgo de sobrecalentamiento del aparato, evite exponerlo a la luz solar directa. No instale la unidad cerca de aparatos que emitan calor, como un calefactor o una estufa

- Si está equipado con un portafusibles externo, el fusible reemplazable es el único elemento que puede ser reparado por el usuario. Cuando reemplace el fusible, use solamente el mismo tipo y valor.

- Este aparato contiene voltajes potencialmente peligrosos. No intente desmontar la unidad. La única pieza que el usuario puede reparar es el fusible. Todas las demás reparaciones deben ser realizadas únicamente por personal de servicio capacitado de fábrica.

CONTENTS

CHAPTER 1: INTRODUCTION

HOW TO USE THIS MANUAL

Please read these instructions in their entirety before configuring a Meyer Sound loudspeaker system. In particular, pay close attention to material related to safety issues.

As you read these 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, or could cause delays or other problems.

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

Meyer Sound Technical Support is available at:

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

THE ULTRA-X40/42 LOUDSPEAKER

Meyer Sound's ULTRA-X40 design continues the tradition of the highly successful UPA loudspeakers—so versatile they have been a universal standard in almost every application for over 35 years. From touring performances to theme parks, worship venues to theater shows, and lecture halls to large scale concerts, Meyer Sound technology has delivered exceptional fidelity with high power, low distortion, and uniformly predictable behavior.

To this legacy, Meyer Sound incorporated technology from the popular and award-winning LEO® Family of loudspeakers to bring multiple enhancements to bear in the ULTRA-X40 design:

- An innovative, highly efficient class D amplifier and advanced signal processing that reproduces any sound source with linearity over a wide dynamic range.

- Significant weight reduction, as well as a reduction in overall size compared to the UPA loudspeakers, for increased power to weight and size ratios.

- A concentric driver configuration with all the benefits of a coaxial driver, yet none of the disadvantages. In addition, this configuration supports directional control of frequencies down to 400 Hz.

- An extremely well-behaved, rotatable horn designed for very precise, even coverage. This horn design, in conjunction with the concentric driver configuration, delivers the same pattern despite the orientation.

With these enhancements, the ULTRA-X40 loudspeaker provides high power output, low distortion, and consistent polar response in a more compact, vented enclosure. The loudspeaker features two 8-inch cone low-frequency drivers and one 3-inch diaphragm compression driver coupled with a rotatable 110° x 50° Constant-Q horn. A more controlled pattern is available on the ULTRA-X42 model, which is fitted with a 70° x 50° constant-Q horn.

Because of its proprietary high-frequency horn and driver configuration, the beamwidth remains consistent within close tolerances in both the horizontal and vertical planes, and across the horn's operating frequency range. Uniformly predictable polar behavior takes much of the guesswork out of system design and assures optimal system performance.

Figure 1: ULTRA-X40 Wide Coverage Loudspeaker

The smooth and consistent performance of the horn is the result of advanced computer modeling combined with meticulous research in Meyer Sound's anechoic chamber. It exhibits a remarkably consistent beamwidth in both the horizontal and vertical planes across a wide operating frequency range. In addition, the ULTRA-X40/42 horns deliver uniform attenuation for all frequencies outside the specified beamwidth.

Meyer Sound designed the ULTRA-X40/42 to be used in almost any application imaginable. The X40/42 can be used as the main system in concert halls, houses of worship, and nightclubs. It also integrates smoothly and easily with other Meyer Sound products in large touring and theatrical sound reinforcement. Its lighter weight and power support rental and portable audio-visual systems. In addition, it can be used as fills or in distributed applications in large venues such as stadiums and theme parks.

ULTRA-X40/42 loudspeakers are available in custom color finishes, allowing them to blend in with any environment. A weather-protected version is also available with treated-wood enclosures and a rain hood to safeguard the rear of the loudspeaker and connectors from the elements.

INTEGRATED AMPLIFIER AND PROCESSING

A self-powered loudspeaker, the ULTRA-X40/42 incorporates a proprietary 3-channel, class D power amplifier and sophisticated control circuitry housed within the cabinet, dramatically simplifying setup and installation. Supply appropriate power to the system, connect a line level signal, and it's ready—leaving you to focus on design implementation instead of installation.

The ULTRA-X40/42 loudspeaker's on-board amplifier is convection cooled.

Figure 2: ULTRA-X40 Amplifier and User Panel

Audio processing includes electronic crossover, correction filters for phase and frequency response, and driver protection circuitry. Phase-corrected electronics ensure flat acoustical amplitude and phase response, resulting in exceptional impulse response and precise imaging.

The amplifier/processing package incorporates Meyer Sound's Intelligent AC™, which auto-selects the correct operating voltage, suppresses high voltage transients, filters EMI and provides soft-start power-up. The ULTRA-X40/42 cabinet provides audio XLR and powerCON20 input and looping output connectors.

An optional RMS™ remote monitoring system module provides comprehensive monitoring of loudspeaker parameters from a host computer running Compass® software.

NOTE: Complete acoustical, electrical and physical specifications are covered in Appendix C on page 59.

RIG-READY

The durable trapezoidal enclosure of the ULTRA-X40/42 loudspeaker has a slightly textured black finish. A powder-coated, round-perforated steel grille provides protection to the front of the loudspeaker.

The ULTRA-X40/42 includes 11 integral M8 rigging points. It also includes an integral 35 mm stand mount receptacle with M20 threads for added stability (Figure 3).

With this versatile integrated rigging, the ULTRA-X40/42 is ready for a wide variety of applications including those requiring pole mounting, hanging individually in horizontal or vertical orientations, or clustering.

Optional rigging accessories include an adjustable 35 mm pole with M20 slug, a yoke (Figure 4), a U-bracket (Figure 5), a pinnable link on a channel that allows the hanging of multiple units from a single pick-up point (Figure 6), a heavy-duty top bracket capable of suspending multiple loudspeakers (Figure 7), and cluster plates for vertical (Figure 7) and horizontal (Figure 8) loudspeaker grouping.

Figure 4: ULTRA-X40 Suspended in an MYA-X40 Yoke Mount

Figure 5: ULTRA-X40 Vertically Held in a MUB-X40 U-Bracket

Figure 3: ULTRA-X40 Pole Mount Receptacle

Figure 6: ULTRA-X40 with an MTC-X40 Top Channel for Pick-Up Point

Figure 8: ULTRA-X40 Horizontally Arrayed Using an MTC-X40 Top Channel and Two MPC50-X40 Cluster Plates

Figure 7: MTB-X40 Suspending two ULTRA-X40 Vertically Using Two MCP50-x40 Cluster Plates

TOTAL SYSTEM APPROACH

The ULTRA-X40 loudspeaker integrates seamlessly with other Meyer Sound products. With compatible acoustical and performance characteristics and dedicated QuickFly rigging hardware, the ULTRA-X40/42 loudspeaker and other Meyer Sound self-powered loudspeakers can provide everything needed to design and implement systems for optimum performance in venues of any size or shape.

> 💡 **TIP:** TIP: Meyer Sound MAPP™ acoustical prediction software allows for quick determination of the coverage, frequency response, impulse response, and maximum linear, undistorted output of Meyer Sound loudspeakers. It also provides useful rigging information.

In addition to smooth integration with other Meyer Sound loudspeakers, the ULTRA-X40/42 loudspeaker can be supplemented with Meyer Sound subwoofers for extended low-frequency bandwidth and headroom. ULTRA-X40/42 systems can be deployed in combination with the 750-LFC very compact low-frequency control element (Figure 9), extending the system frequency response down to 35 Hz, or the 900-LFC compact low-frequency control element (Figure 10), which supports frequencies down to 30 Hz.
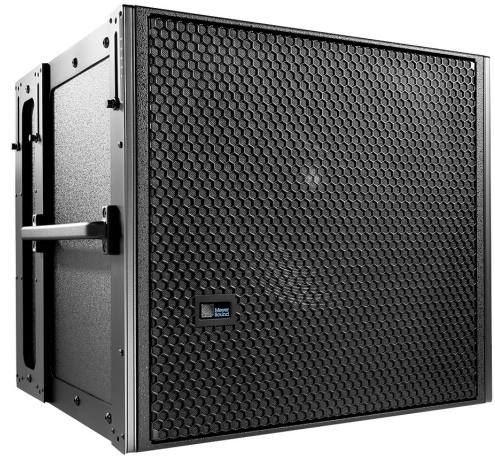

Figure 10: The 900-LFC Compact Low Frequency Control Element

The ULTRA-X40/42 is supported by Meyer Sound's MAPP acoustical prediction program and the Galileo™ GALAXY Network Platform loudspeaker management system. Once a Meyer Sound system is designed and installed, its performance can be confirmed and optimized using a SIM audio analyzer system.

Figure 9: The 750-LFC Very Compact Low Frequency Control Element

CHAPTER 2: POWER REQUIREMENTS

The ULTRA-X40/42 loudspeaker combines advanced loudspeaker technology with equally advanced power capabilities. Understanding power distribution, voltage and current requirements, and electrical safety guidelines is critical for the safe operation of the ULTRA-X40/42.

AC POWER DISTRIBUTION

All components in an audio system (self-powered loudspeakers, mixing consoles, and processors) must be properly connected to an AC power distribution system, ensuring that AC line polarity is preserved and that all grounding points are connected to a single node or common point using the same cable gauge (or larger) as the neutral and line cables.

⚠️ **CAUTION:** Make sure the voltage received by the ULTRA-X40/42 loudspeaker remains within its 90–264 V AC operating range. In addition, the ground line must always be used for safety reasons and the line-to-ground voltage should never exceed 250 V AC (typically 120 V AC from line to ground).

⚠️ **CAUTION:** Before applying AC power to any Meyer Sound self-powered loudspeaker, make sure that the voltage potential difference between the neutral and earth-ground lines is less than 5 V AC when using single-phase AC wiring.

📖 **NOTE:** Improper grounding of connections between loudspeakers and the rest of the audio system may produce noise or hum, or cause serious damage to the input and output stages of the system's electronic components.

120 V AC, 3-Phase Wye System (Single Line)

Line-Neutral-Earth/Ground

Figure 11 illustrates a basic 120 V AC, 3-phase Wye distribution system with the loudspeaker load distributed across all three phases, with each loudspeaker connected to a single line and common neutral and earth/ground lines. This system delivers 120 V AC to each loudspeaker.
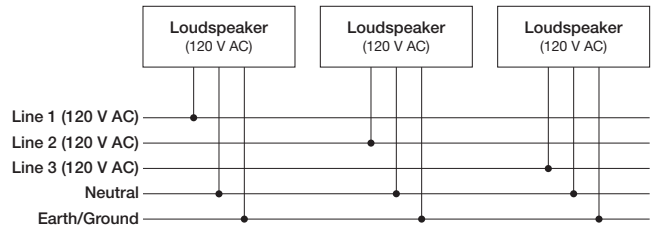

Figure 11: 120 V AC, 3-Phase Wye System (Single Line to Loudspeakers)

120 V AC, 3-Phase Wye System (Two Lines)

Line-Line-Earth/Ground

Figure 12 illustrates a 120 V AC, 3-phase Wye distribution system with each loudspeaker connected to two lines and a common earth/ground line. This configuration is possible because ULTRA-X40/42 tolerates elevated voltages from the ground line and does not require a neutral line. This system delivers 208 V AC to each loudspeaker.
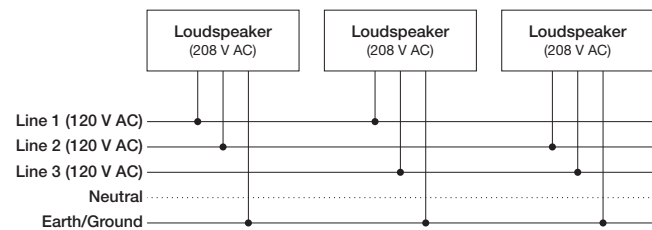

Figure 12: 120 V AC, 3-Phase Wye System (Two Lines to Loudspeakers)

💡 **TIP:** The 120 V AC, 3-phase Wye system with two lines is recommended because it allows loudspeakers to draw less current than with single-line systems, thereby reducing voltage drop due to cable resistance. It also excludes the potential of varying ground to neutral voltages producing an audible hum.

230 V AC, 3-Phase Wye System (Single Line)

Line-Neutral-Earth/Ground

Figure 13 illustrates a basic 230 V AC, 3-phase Wye distribution system with the loudspeaker load distributed across all three phases, with each loudspeaker connected to a single line and common neutral and earth/ground lines. This system delivers 230 V AC to each loudspeaker.
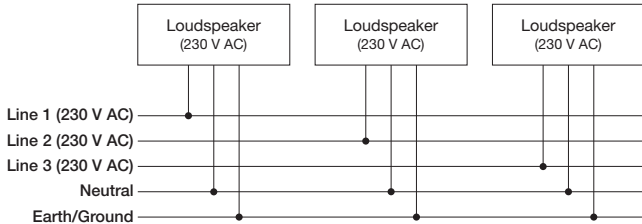

Figure 13: 230 V AC, 3-Phase Wye System (Single Line to Loudspeakers)

⚠ **CAUTION:** For 230 V AC, 3-phase Wye systems, never connect two lines to the AC input of ULTRA-X40/42, as the resulting voltage would exceed the upper voltage limit (275 V AC) and will damage the loudspeaker.

AC CONNECTORS

The ULTRA-X40/42 user panel includes two powerCON 20 connectors (Figure 14), one for AC Input (blue) and one for AC Loop Output (gray).

Figure 14: AC Input (Left) and AC Loop Output (Right) Connectors

AC Input (Blue)

The blue AC Input connector supplies power to ULTRA-X40/42. The 3-conductor powerCON 20 is rated at 20 A and uses a locking connector that prevents accidental disconnections. A 10-foot AC power cable, rated at 15 A, is included with each loudspeaker. If the included AC power cable is replaced, make sure to use a cable with the appropriate power plug (on the other end) for the region where the unit will be operated. ULTRA-X40/42 requires a grounded outlet. To operate safely and effectively, it is extremely important that the entire system be properly grounded.

The AC Input connector also supplies power to any additional loudspeakers connected to the loudspeaker's gray Loop Output connector.

⚠ **CAUTION:** When looping AC power for loudspeakers, do not exceed the current capability of the AC Input connector (20 A) or the included AC power cable (15 A). Consider the total current draw for all loudspeakers on the circuit, including the first loudspeaker (Table 1).

AC Loop Output (Gray)

The gray AC Loop Output connector allows multiple ULTRA-X40/42 to be looped and powered from a single power source. The 3-conductor powerCON 20 is rated at 20 A and uses a locking connector that prevents accidental disconnections. For applications that require multiple ULTRA-X40/42, connect the AC Loop Output of the first loudspeaker to the AC Input of the second loudspeaker, and so forth.

The maximum number of loudspeakers that can be looped from the AC Loop Output connector is determined by the voltage of the power source, the current draw of the looped loudspeakers, the circuit breaker rating, and the rating of the AC power cable connected to the first ULTRA-X40/42 loudspeaker (Table 1).

Table 1: Maximum ULTRA-X40/42s that Can Be Looped with AC Power

Circuit Breaker/ Connector Rating	115 V AC	230 V AC	100 V AC
15 A	6 looped (7 total)	13 looped (14 total)	5 looped (6 total)
20 A	9 looped (10 total)	18 looped (19 total)	8 looped (9 total)

📝 **NOTE:** Current draw for ULTRA-X40/42 is dynamic and fluctuates as operating levels change. The indicated number of loudspeakers that can be looped assumes that operating levels are normal and not such that loudspeakers are constantly limiting.

ULTRA-X40/42 ships with a gray powerCON 20 cable mount connector, rated at 20 A, for assembling AC looping cables. Assembled 1-meter AC looping cables (PN 28.115.032.03) are also available from Meyer Sound.

WIRING AC POWER CABLES

ULTRA-X40/42 ships with a gray powerCON 20 cable mount connector, rated at 20 A, for assembling AC looping cables (Figure 15). The pins on the powerCON 20 cable mount connector are labeled as follows:

- L (Line)

- N (Neutral)

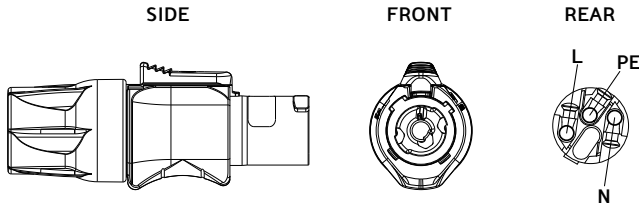- PE (Protective Earth or Ground)

Figure 15: powerCON20Cable Mount Connector

How AC power cables are wired is determined by the type of AC power distribution system used (see "AC Power Distribution" on page 15). When wiring AC power cables for single-line systems, use one of the wiring schemes shown in Figure 16 and described in Table 2:
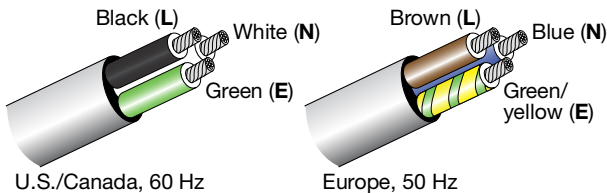

Figure 16: AC Wiring Scheme

Table 2: AC Wiring Scheme

Wire Color		Attach to the Following Terminal
U.S. / Canada 60 Hz	**European 50 Hz**	
Black	Brown	Hot or live (L)
White	Blue	Neutral (N)
Green	Green and Yellow	Protective earth / ground (E or PE)

⚠ **CAUTION:** When wiring AC power cables and distribution systems, it is important to preserve AC line polarity and connect the earth ground at both ends of the cable. ULTRA-X40/42 requires a grounded connection. Always use a grounded outlet and plug. It is extremely important that the system be properly grounded to operate safely and properly. Do not ground-lift the AC cable.

VOLTAGE REQUIREMENTS

ULTRA-X40/42 operates as intended when receiving AC voltage within the following range:

- 90–264 V AC, 50–60 Hz

If the voltage drops below 90 V, the loudspeaker uses stored power to continue operating temporarily; the loudspeaker powers off if the voltage does not return to its operating range.

If the voltage rises above 275 V, the power supply could become damaged.

⚠ **CAUTION:** The power source for ULTRA-X40/42 should always operate within the required operating range, at least a few volts from the upper and lower limits. This approach ensures that AC voltage variations from the service entry—or peak voltage drops due to cable runs—will not cause the loudspeaker's amplifier to cycle on and off or cause damage to the power supply.

CURRENT REQUIREMENTS

Current draw for loudspeakers is dynamic and fluctuates as operating levels change. Because different cables and circuit breakers heat up at varying rates, it is important to understand the following types of current ratings and how they affect circuit breaker and cable specifications.

- **Idle Current** — The maximum rms current during idle periods.

- **Maximum Long-Term Continuous Current** — The maximum rms current during a period of at least 10 seconds. The maximum long-term continuous current is used to calculate temperature increases for cables and to ensure that the size and gauge of each cable conforms to electrical code standards. This current rating is also used to select appropriately rated, slow-reacting thermal breakers, which are recommended for loudspeaker power distribution. In addition, the maximum long-term continuous current can be used to calculate the AC looping capability for ULTRA-X40/42 loudspeakers.

- **Burst Current** — The maximum rms current during a period of around 1 second. The burst current is used as a rating for magnetic breakers. It is also used for calculating the peak voltage drop in long AC cable runs according to the following formula:

$$V pk (drop) = I pk \times R (cable\ total)$$

- **Maximum Instantaneous Peak Current** — A rating for fast-reacting magnetic breakers.

Use the information in Table 3 to select the appropriate cable gauge and circuit breaker ratings for the system's operating voltage.

Table 3: ULTRA-X40/42 Current Draw

Current Draw	115 V AC	230 V AC	100 V AC
Idle	0.27 A rms	0.25 A rms	0.29 A rms
Maximum Long-Term Continuous	1.9 A rms	1.0 A rms	2.2 A rms
Burst	3.1 A rms	1.5 A rms	3.4 A rms
Maximum Instantaneous Peak	6.9 A peak	3.4 A peak	7.9 A peak

The minimum electrical service amperage required by a loudspeaker system is the sum of the maximum long-term continuous current for all loudspeakers. An additional 30 percent above the combined Maximum Long-Term Continuous amperages is recommended to prevent peak voltage drops at the service entry.

NOTE: For best performance, the AC cable voltage drop should not exceed 10 V (10 percent at 115 V and 5 percent at 230 V). This approach ensures that the AC voltage variations from the service entry—or peak voltage drops due to longer cable runs—do not cause the amplifier to cycle on and off.

INTELLIGENT AC POWER SUPPLY

ULTRA-X40/42's Intelligent AC™ power supply automatically selects the correct operating voltage (allowing the loudspeaker to be used internationally without manually setting voltage switches), eliminates high inrush currents with soft-start power up, suppresses high-voltage transients up to several kilovolts, filters common mode and differential mode radio frequencies (EMI), and sustains operation temporarily during low-voltage periods.

Powering on ULTRA-X40/42

When powering on ULTRA-X40/42, the following startup events take place over several seconds.

1. Audio output is muted.

2. Voltage is detected and the power supply mode is automatically adjusted as necessary.

3. The power supply ramps up.

4. On the user panel, the On/Status LED flashes multiple colors successively.

5. The On/Status LED turns solid green, indicating the loudspeaker is unmuted and ready to output audio.

⚠ **CAUTION:** If the On/Status LED does not turn solid green, or the ULTRA-X40/42 does not output audio after 10 seconds, remove AC power immediately and verify that the voltage is within the required range. If the problem persists, contact Meyer Sound Technical Support.

ELECTRICAL SAFETY GUIDELINES

Make sure to observe the following important electrical and safety guidelines.

- The powerCON 20 connector should not be engaged or disengaged when under load or energized. Either de-energize or disconnect the other end of the cable.

- ULTRA-X40/42 requires a grounded outlet. Always use a grounded outlet and plug.

Earth ground

Chassis ground
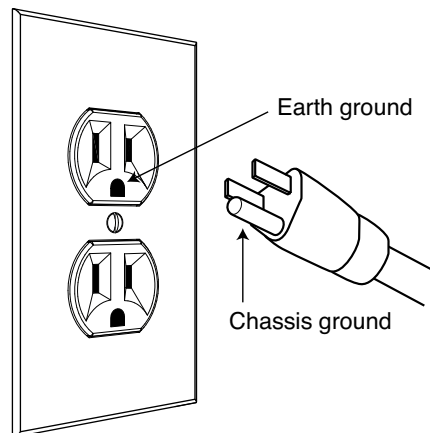
■ Do not use a ground-lifting adapter or cut the AC cable ground pin.
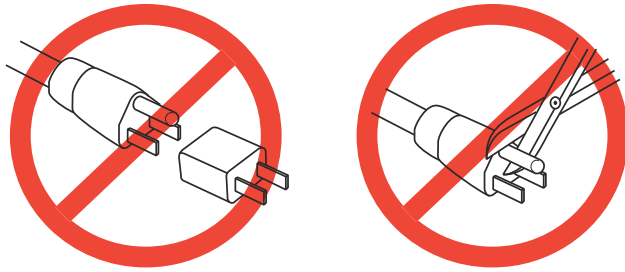
■ Do not exceed the current capability of the 20 A AC Input connector for the loudspeaker. When looping loudspeakers, consider the total current draw for all loudspeakers on the circuit, including the first loudspeaker.

■ Make sure the AC power cable for the loudspeaker has the appropriate power plug (on the other end) for the area in which you will operate the loudspeaker. In addition, the AC power cable must be rated for the total current draw of all loudspeakers looped from the power source.

■ Do not operate the unit if the power cable is frayed or broken.

■ Keep all liquids away from ULTRA-X40/42 loudspeakers to avoid hazards from electrical shock.

CHAPTER 3: AMPLIFICATION AND AUDIO CONNECTORS

The ULTRA-X40/42 drivers are powered by a proprietary 3-channel, open-loop, class D amplifier. The audio signal is processed with electronic crossover, and correction filters for flat phase and frequency responses, and by driver protection circuitry. Each channel has peak and rms limiters that prevent driver over-excursion and regulate voice coil temperatures.

The ULTRA-X40/42 user panel (Figure 17) includes Input and Loop output connectors for audio, Limit and Active LEDs, and RMS connectors and controls (see Chapter 6, "RMS Remote Monitoring System").
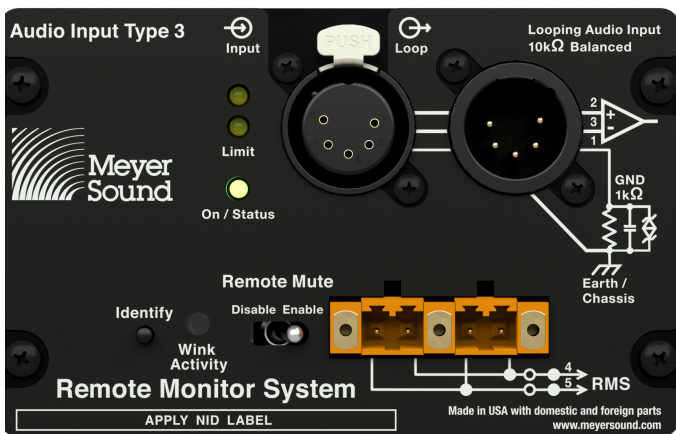
Figure 17: ULTRA-X40/42 User Panel (5-pin XLR and optional RMS)

AUDIO CONNECTORS

ULTRA-X40/42 is available with XLR 5-pin (Figure 18) or 3-pin connectors (Figure 19) for audio Input and audio Loop output. XLR 5-pin connectors accommodate both balanced audio and RMS signals.

Figure 18: XLR 5-Pin Audio Connectors, Input and Loop Output
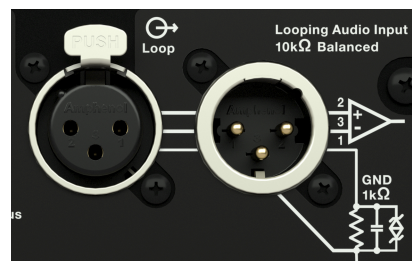
Figure 19: XLR 3-Pin Audio Connectors, Input and Loop Output

Audio Input (XLR 3-Pin or 5-Pin Female)

The XLR 3-pin or 5-pin female Input connector accepts balanced audio signals with an input impedance of 10 kΩ. The connector uses the following wiring scheme:

- **Pin 1** — 1 kΩ to chassis and earth ground (ESD clamped)
- **Pin 2** — Signal (+)
- **Pin 3** — Signal (–)
- **Pin 4** — RMS (polarity insensitive)
- **Pin 5** — RMS (polarity insensitive)
- **Case** — Earth (AC) ground and chassis

> **NOTE:** Pins 4 and 5 (RMS) are included only with XLR 5-pin connectors.

Pins 2 and 3 carry the input as a differential signal. Pin 1 is connected to earth through a 1 kΩ, 1000 pF, 15 V clamped network. This circuitry provides virtual ground lift for audio frequencies while allowing unwanted signals to bleed to ground. Make sure to use balanced XLR audio cables with pins 1–3 connected on both ends. Telescopic grounding is not recommended and shorting an input connector pin to the case may cause a ground loop, resulting in hum.

TIP: If the loudspeaker produces unwanted noise or hiss, disconnect its input cable. If the noise stops, there is most likely nothing wrong with the loudspeaker. To locate the source of the noise, check the source audio, AC power, and electrical ground.

Audio Loop Output (XLR 3-Pin or 5-Pin Male)

The XLR 3-pin or 5-pin male Loop output connector allows multiple loudspeakers to be looped from a single audio source. The Loop output connector uses the same wiring scheme as the Input connector (see "Audio Input (XLR 3-Pin or 5-Pin Female)" on page 21). For applications that require multiple ULTRA-X40/42, connect the Loop output of the first loudspeaker to the Input of the second loudspeaker, and so forth.

NOTE: The Loop output connector is wired in parallel to the Input connector and transmits the unbuffered source signal even when the loudspeaker is powered off.

Calculating Load Impedance for Looped Audio Signals

To avoid distortion when looping multiple loudspeakers, make sure the source device can drive the total load impedance of the looped loudspeakers. In addition, the source device must be capable of delivering approximately 20 dBV (10 V rms into 600 Ω) to yield the maximum SPL over the operating bandwidth of the loudspeakers.

To calculate the load impedance for the looped loudspeakers, divide 10 kΩ (the input impedance for a single loudspeaker) by the number of looped loudspeakers. For example, the load impedance for 10 ULTRA-X40/42 is 1000 Ω (10 kΩ/ 10). To drive this number of looped loudspeakers, the source device should have an output impedance of 100 Ω or less. This same rule applies when looping ULTRA-X40/42 with other Meyer Sound self-powered loudspeakers.

NOTE: Most source devices are capable of driving loads no less than 10 times their output impedance.

TIP: Audio outputs from Meyer Sound's loudspeaker GALAXY Network Platform have an output impedance of 50 ohms. Each output can drive up to 20 Meyer Sound (10 kΩ) loudspeakers without distortion.

CAUTION: Make sure that all cabling for looped loudspeakers is wired correctly (Pin 1 to Pin 1, Pin 2 to Pin 2, and so forth) to prevent the polarity from being reversed. If one or more loudspeakers in a system have reversed polarity, frequency response and coverage will be significantly degraded.

TRUPOWER LIMITING

The ULTRA-X40/42 employs Meyer Sound's advanced TruPower® limiting. Conventional limiters assume a constant driver impedance and set the limiting threshold by measuring voltage alone. This method is inaccurate, because driver impedances change as frequency content in the source material changes, and as thermal values for the loudspeaker's voice coil and magnet vary. Consequently, conventional limiters often begin limiting prematurely, which reduces system headroom and dynamic range.

In contrast, TruPower limiting anticipates varying driver impedances by measuring both current and voltage to compute the actual power dissipation in the voice coil. This approach improves performance, both before and during limiting, by allowing the driver to produce the maximum SPL across its entire frequency range, while also retaining signal peaks. TruPower limiting also eliminates power compression at high levels over lengthy periods, which helps regulate voice coil temperatures, thereby extending the life of the driver.

HF and LF Limit LEDs

The low- and high-frequency drivers for ULTRA-X40/42 are powered by separate amplifier channels, each with their own limiter. Limiting activity is indicated with two Limit LEDs on the user panel. The top Limit LED (Figure 20) indicates limiting for the high-frequency channel and the bottom Limit LED indicates limiting for the low-frequency channel.

Figure 20: ULTRA-X40/42 Limit LEDs

When engaged, the limiters not only protect the drivers but also prevent signal peaks from causing excessive distortion in the amplifier channels, thereby preserving headroom and maintaining smooth frequency response at high levels. When levels return to normal, below the limiter thresholds, limiting ceases.

ULTRA-X40/42 performs within its acoustical specifications at normal temperatures when the Limit LEDs are unlit, or when the LEDs are lit for 2 seconds or less and then turn off for at least 1 second. If the LEDs remain lit for longer than 3 seconds, the loudspeaker enters hard limiting where:

- Increases to the input level have no effect

- Distortion increases due to clipping

- Drivers are subjected to excessive heat and excursion, thereby compromising their lifespan

⚠ **CAUTION:** The Limit LEDs indicate when a safe, optimum level is exceeded. If an ULTRA-X40/42 loudspeaker system begins to limit before reaching the desired SPL, consider adding more units to the system.

AMPLIFIER COOLING SYSTEM

The ULTRA-X40/42 loudspeaker is convection cooled. The amplifier's heat sink provides natural convection cooling from the air flowing near its fins.

⚠ **CAUTION:** To keep ULTRA-X40/42 from overheating, allow at least 3 in behind the loudspeaker for proper ventilation.

⚠ **CAUTION:** The ULTRA-X40/42 heat sink can reach temperatures up to 80° C (176° F) during extreme operation. Wait 15 minutes for the unit to cool before touching.

ON/STATUS LED

During normal operation, when ULTRA-X40/42 is powered on, the On/Status LED is solid green. If the loudspeaker encounters a hardware fault, or the unit begins to overheat, the LED flashes red. In some instances, the loudspeaker will continue to output audio while the LED flashes red, though with a reduction in the limiter threshold and acoustic output to protect the loudspeaker.

If a loudspeaker is overheating (for RMS-equipped loudspeakers, you can verify this situation in Compass RMS), a reduction in SPL may be necessary. If after a reduction in SPL and an appropriate cooling period the On/Status LED continues to flash red (does not return to solid green), contact Meyer Sound Technical Support.

If the On/Status LED flashes red and the loudspeaker does not output audio, contact Meyer Sound Technical Support immediately.

⚠ **CAUTION:** If an ULTRA-X40/42 loudspeaker system consistently overheats before reaching the desired SPL, consider adding more units to the system.

📖 **NOTE:** During startup, the On/Status LED flashes multiple colors successively. For more information about the power on sequence, see "Intelligent AC Power Supply" on page 18.

💡 **TIP:** When an ULTRA-X40/42 is connected to an RMS network, the Compass RMS software provides additional feedback about the loudspeaker's hardware status and operating temperature. For more information, see Chapter 6, "RMS Remote Monitoring System."

CHAPTER 4: ADDING LOW FREQUENCY CONTROL

An ULTRA-X40/42 loudspeaker system can be deployed with Meyer Sound self-powered low frequency control elements (see Table 4). These subwoofers achieve very low frequency responses and extend the system response appreciably, increasing the overall acoustic power of the system in the lowest frequencies.

The ideal ratio of ULTRA-X40/42 loudspeakers to low frequency control element depends on the following variables:

- Subwoofer model
- System configuration
- Frequency content of source material
- Headroom required for low frequencies

For most applications, the ratios in Table 4 should yield good results.

Table 4: Recommended Meyer Sound Subwoofer

Subwoofer	Frequency Response	Recommended Ratio (Number of ULTRA-X40/42s per Subwoofer)
USW-210P	32–123 Hz ±4 dB	1:1 for most applications 1:2 for applications requiring more low end
750-LFC	37–110 Hz ±4 dB	1:1 for most applications
900-LFC	32–115 Hz ±4 dB	2:1 for most applications 1:1 for applications requiring extreme low end
1100-LFC	30–85 Hz ±4 dB	4:1 for most applications

ADDING SUBWOOFERS BY DAISY-CHAINING

Full-range signals can be connected directly to Meyer Sound self-powered loudspeakers because the loudspeakers have built-in active crossovers. Subwoofers can be added to an ULTRA-X40/42 system by simply daisy-chaining them to the ULTRA-X40/42 loudspeakers.

To daisy-chain the suggested number of ULTRA-X40/42 loudspeakers for your subwoofer (see Table 1).

1. Connect the source signal to the Input of the first ULTRA-X40/42, then connect the Loop output of the first ULTRA-X40/42 to the Input of the second ULTRA-X40/42 (and so forth).

2. Connect the Loop output of the last ULTRA-X40/42 in the chain to the subwoofer Input.

When ULTRA-X40/42 loudspeakers are coplanar, or they are very close together, about four to six feet like in the case of pole mounting, the phase response will work well in the area of interaction and the result will be a fairly flat frequency response. However, the response will show an increase in the 60–200 Hz range where the response of the loudspeakers overlaps.

> **NOTE:** If the subwoofer's Limit LEDs begin to light before reaching the required SPL, consider adding more subwoofers to meet the SPL requirements without exposing the drivers to excessive heat and excursion.

USING A PROCESSOR

In larger systems when individual control for the ULTRA-X40/42 and subwoofers are needed or desired, if the ULTRA-X40/42 loudspeakers and subwoofer are more than six feet apart, or if a delay is required between them, use a measurement system like Meyer Sound's SIM to determine appropriate delay and polarity settings.

> **CAUTION:** Make sure the source signal is sufficient to drive the total load impedance of the daisy-chained loudspeakers (see "Calculating Load Impedance for Looped Audio Signals" on page 22).

> **TIP:** MAPP can be used to accurately predict the appropriate loudspeaker deployment and subwoofer integration for loudspeaker systems, complete with coverage data, system delay and equalization settings, rigging information, and detailed design illustrations. For more information, see "MAPP System Design Tool" on page 51.

CHAPTER 5: QUICKFLY RIGGING

The ULTRA-X40 and ULTRA-X42 loudspeakers are compatible with Meyer Sound's QuickFly system, a comprehensive collection of custom-designed rigging, flying, and mounting options. Comprised of rugged, reliable, and easy-to-configure components, QuickFly lets you deploy ULTRA-X40 and ULTRA-X42 loudspeakers as either individual loudspeakers or as arrays at precise angles to take full advantage of their directional components.

Important Safety Considerations!

When installing Meyer Sound loudspeakers, the following precautions should always be observed:

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

- Use mounting and rigging hardware that has been rated to meet or exceed the weight being hung.

- Make sure to attach mounting hardware to the building's structural components (studs or joists), and not just to the wall surface. Verify that the building's structure and the anchors used for the installation will safely support the total weight of the mounted loudspeakers.

- Use mounting hardware appropriate for the surface where the loudspeaker will be installed.

- Make sure bolts and eye bolts are tightened securely. Meyer Sound recommends using medium strength blue thread locker on eye bolt threads and safety cables.

- Inspect mounting and rigging hardware regularly. Immediately replace any worn or damaged components.

RIGGING POINTS

The top and bottom faces for the ULTRA-X40/42 cabinet include high-strength, corrosion-resistant stainless steel points that provide M8 x 1.25 threaded holes for easy connection to QuickFly rigging and third-party mounting options.
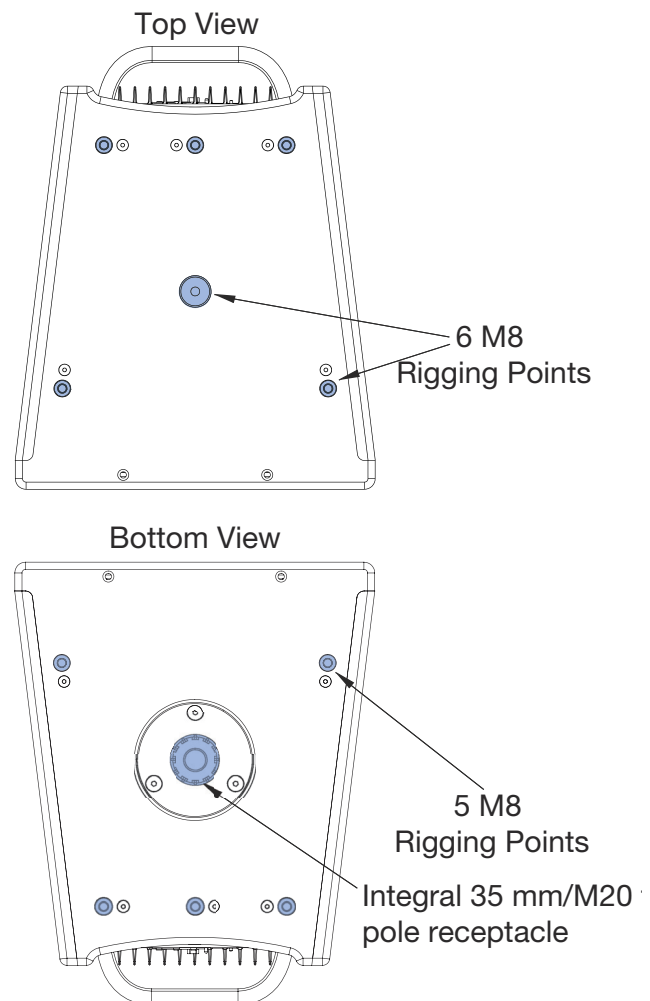
Figure 21: ULTRA-X40/42 Rigging Points

ULTRA-X40/42 RIGGING OPTION ACCESSORIES

Meyer Sound offers a number of rigging options that facilitate a wide variety of configurations (Table 5).

Table 5: ULTRA-X40/42 Rigging Options

Model	Features
MPK-POLE-35MM-M20 Adjustable Pole Mount Kit (PN 40.010.973.01)	Adjustable length 927–1524 mm (36.5–60 in) pole with assisted lift. Lower shaft fits 35 mm cups or use the removable M20 threaded lug for added stability. Upper shaft includes a PAS-M20 Adapter Sleeve to fit loudspeakers with 35 mm and M20 internal pole mounts onto a 35 mm speaker stand. (Can also buy the PAS-M20 Adapter Sleeve separately). Additional 35 mm to 38 mm (1.5 in) adapter included.
PAS-M20-35MM Adapter Sleeve (PN.40.010.974.01)	Adapts a 35 mm pole to a 35 mm M20 threaded connection to provide additional stability when using 35 mm M20 pole cups.
MYA-X40 Mounting Yoke Kit (PN 40.287.039.01)	The MYA-X40 Yoke suspends a single ULTRA-X40/42 loudspeaker and supports a wide range of horizontal and vertical adjustments. The yoke attaches to the top of the loudspeaker using three rig nuts. The kit includes three M8 bolts and three M8 knobs. The yoke may also be mounted on a 35 mm pole using the optional MSA-STAND Adapter Cup 35MM accessory to facilitate easy panning and tilting.
MSA-STAND Adapter Cup 35MM (PN 40.086.013.01)	This compact cup-type adapter can be used to mount the MYA-X40 Mounting Yoke on a pole to allow for easy panning and tilting of the ULTRA-X40/42.
MUB-X40 U-Bracket Kit (PN 40.287.055.01)	The MUB-X40 U-Bracket allows a single ULTRA-X40/42 loudspeaker to be mounted to a wall (in either vertical or horizontal orientations), to the ceiling or onto the floor. The kit includes two M8 bolts, two M8 knobs, and a 35 mm diameter, Thread Reducer M20 to M8 (35 MM) to convert the cabinet's built-in pole mount internal threads to M8 size. The MUB-X40 U-Bracket can also mount an ULTRA-X40/42 to a pole in the horizontal orientation using the 35MM Pole Stand Adapter.
35MM Pole Stand Adapter (PN 40.010.971.01)	This large base stand adapter can be used to mount the MTB-X40 Top Bracket or the MUB-X40 U-bracket onto a pole.
MTC-X40 Top Channel Kit (PN 40.287.130.01)	The MTC-X40 Top Channel kit includes a pinnable link in a channel that mounts directly to the top of the ULTRA-X40/42 rig nuts or into an MCP50-X40 or MCP70-X40 plate and supports pick-up of up to three ULTRA-X40/42 loudspeakers from a single point using the two included lock pins and 3/8 in shackle. Using the MTC-X40 Top Channel at the bottom of the ULTRA-X40/42 to pick up multiple loudspeakers requires the use of a Thread Reducer M20 to M8 (35MM), which is not included.
MCP50-X40 Cluster Plate Kit (PN 40.287.100.01)	The MCP50-X40 50 Degree Cluster Plate kit includes two cluster plates to facilitate installation of ULTRA-X40/42 loudspeakers in both horizontal and vertical clusters at angles between 10 and 50 degrees in 5 degree increments. The kit includes eight M8 bolts and eight M8 knobs. The MTC-X40 Top Channel accessory (sold separately) can be attached to the MCP50-X40 as a top pick up point.
MCP70-X40 Cluster Plate Kit (PN 40.287.400.01)	The MCP70-X40 70 Degree Cluster Plate kit includes two cluster plates to facilitate installation of ULTRA-X40/42 loudspeakers in both horizontal and vertical clusters at angles between 40 and 70 degrees in 5 degree increments. The kit includes eight M8 bolts and eight M8 knobs. The MTC-X40 Top Channel accessory (sold separately) can be attached to the MCP70-X40 as a top pick up point.
MTB-X40 Top Bracket Kit (PN 40.287.150.01)	The MTB-X40 Top Bracket kit includes a heavy-duty, U-bracket style accessory that facilitates mounting of ULTRA-X40/42 loudspeakers from the ceiling or a truss using the cluster plates. The design supports 5–25 degrees of downtilt and 5 degrees of uptilt. In addition, the MTB-X40 Top Bracket enables mounting of a single ULTRA-X40/42 onto the floor for front-fills. The kit includes four M8 bolts and four M8 knobs. The MTB-X40 Top Bracket can also mount an ULTRA-X40/42 to a pole in the horizontal orientation using the 35MM Pole Stand Adapter.
Thread Reducer M20 to M8 (35MM) (PN 40.010.540.01)	The Thread Reducer kit includes a 35 mm diameter, M20 to M8 thread size adapter to convert the cabinet's built-in pole mount internal threads to M8 size. It is necessary for installing the MUB-X40 U-Bracket (one included in MUB-X40 U-Bracket kit) and when installing the MTC-X40 Top Channel or eye bolts at the bottom of a cabinet (not included in the eye bolts or MTC-X40 Top Channel kits).

Table 5: ULTRA-X40/42 Rigging Options (Continued)

Model	Features
3/8 in Shackle, Black (PN 124.145)	Replacement 3/8 in Black Shackle
eye bolts (PN 40.287.057.01)	Replacement black-coated M8 x 13 mm eye bolts, quantity 2 .
0.25 in x 0.90 in Lock Pin with washer (PN 45.010.936.01)	Replacement 0.25 in x 0.90 in Lock Pin with washer.
M8 Knob and Washer Assembly (PN 45.287.061.01)	Replacement M8 Knob and Washer Assembly
M8 Hex Head Screw with Washer (PN 45.287.461.01)	Replacement M8 Hex Head Screw with Washer, M8x17 mm, stainless steel, black

ROTATING THE HORN

The ULTRA-X40/42 may be rotated for increased installation flexibility. However, care must be taken so as to not damage the loudspeaker.

NOTE: In the paragraphs below, instructions and graphics for the ULTRA-X40 are used. The same procedure holds for the ULTRA-X42 (with 110° replaced by 70°).

To rotate the horn, use the following steps:

1. Remove the grille by removing the four 10-32 x 1.00-inch flat-head Phillips screws (two on the top and two on bottom) of the loudspeaker grille.
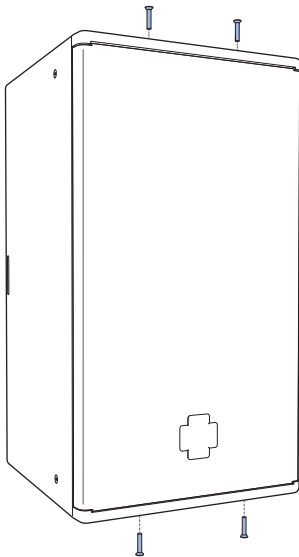
Figure 22: Remove ULTRA-X4x Grille Frame.

2. Remove the four truss-head Phillips 10-32 x 3/4-inch screws holding the horn in place.

Engraved angle label
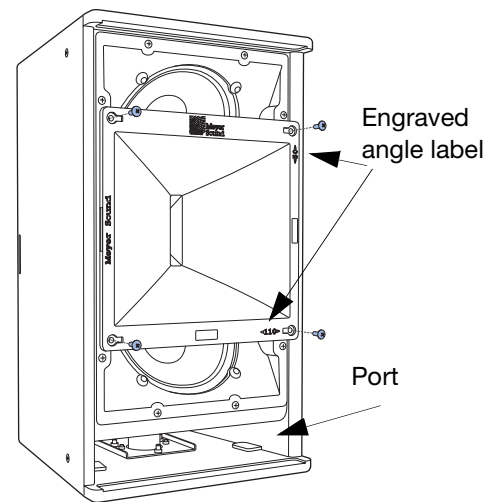
Port

Figure 23: Removing Four Screws Holding Horn in Place

3. Determine the present orientation of the horn by checking the horn throat orientation when the speaker is vertical with the port at the bottom. The cabinet is vertical when the Meyer Sound Logo on the horn and on the bezel are at the top (Figure 24).

4. If the present orientation is 110° horizontal by 50° vertical (**horn throat** is **vertical**, see Figure 24 on page 30), the horn may only be rotated in the **clockwise** direction (Figure 25 on page 30).

⚠ **CAUTION:** Do not pull the horn out to rotate and do not use force. It should rotate smoothly if rotated in the correct direction. The rotation angle is NOT continuous. It is limited to 90° of travel between the two orientations where the Meyer Sound emboss on the bezel lines up with either the company logo (Figure 24) or the engraved company name (Figure 26) on the horn.

Top of Cabinet

Meyer Sound Emboss on Bezel

Meyer Sound Logo on Horn

0°

Horn Throat in Vertical Orientation
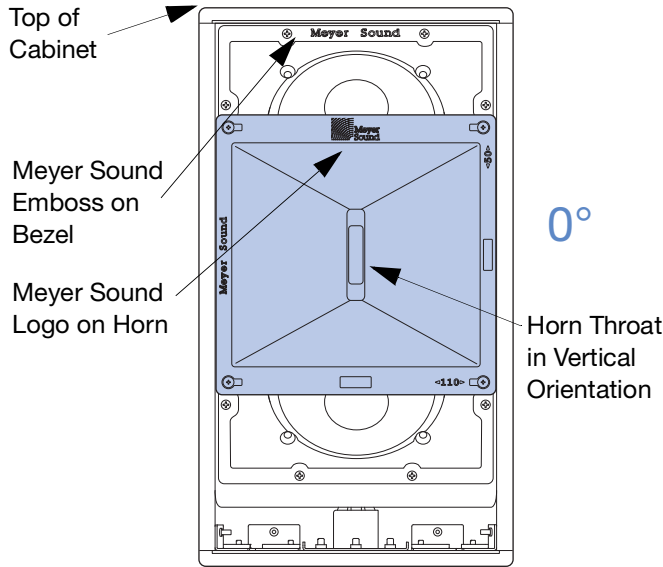
Figure 24: 110° horizontal by 50° vertical horn orientation

+90° rotation direction
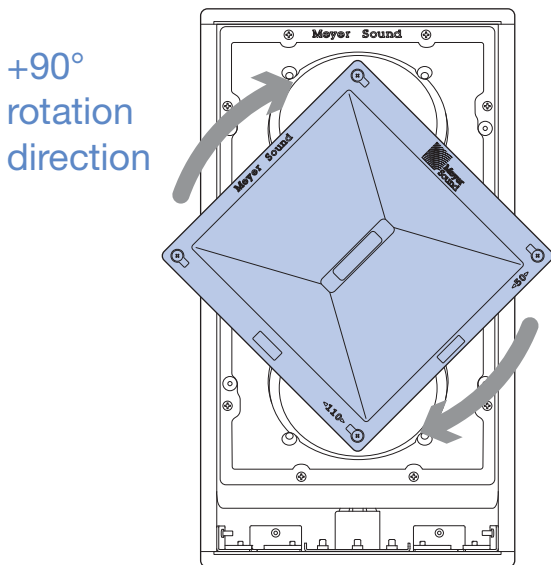
*Figure 25: **Clockwise** Rotation of Horn to achieve 50° horizontal by 110° vertical horn orientation*

5. If the present orientation is 50° horizontal by 110° vertical (**horn throat** is **horizontal**, see Figure 26), the horn may only be rotated in the **counter-clockwise** direction (Figure 27).

Top of Cabinet

Meyer Sound Emboss on Bezel

Engraved Company Name on Horn

90°

Horn Throat in Horizontal Orientation
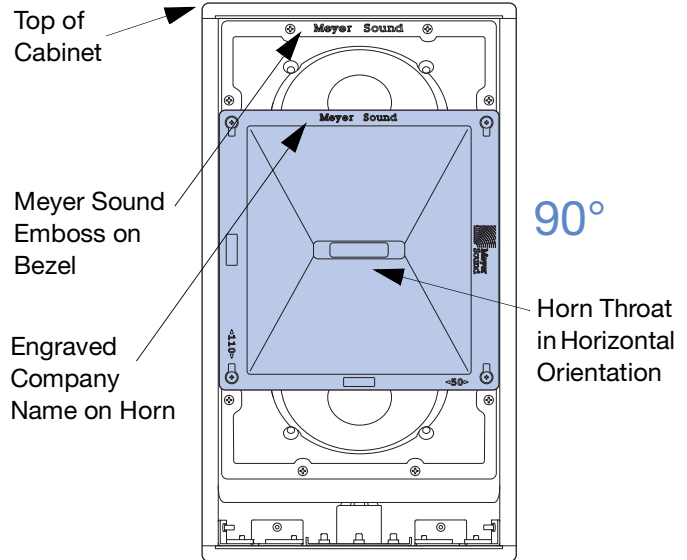
Figure 26: 110° horizontal by 50° vertical horn orientation

-90° rotation direction
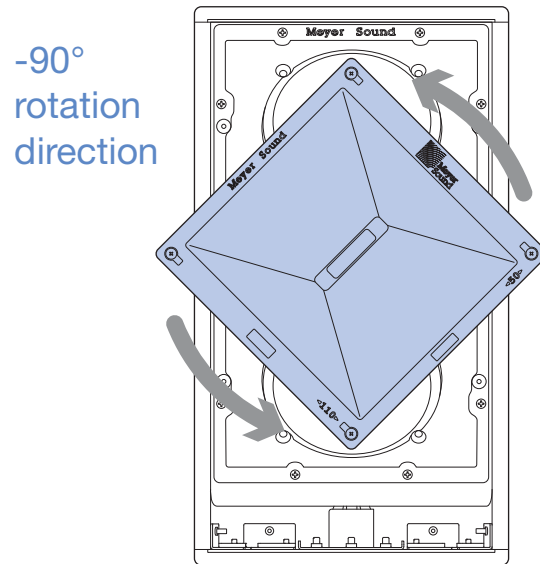
*Figure 27: **Counter-clockwise** Rotation of Horn to achieve 110° horizontal by 50° vertical horn orientation*

6. Replace the four screws removed in Step 2 to resecure the horn into position. Be sure to use the 10-32 x 3/4-inch screws. The recommended torque value for the horn screws is 19 in-lb (2.15 N·m).

7. Replace the grille and secure it with the four 10-32 x 1.00-inch screws removed in step 1. Meyer Sound recommends applying blue thread locker (medium strength) to screws in the leading three threads before replacing. The recommended torque value for the grille screws is 8 in-lb (0.90 N·m).

BASIC EYE BOLT RIGGING

The ULTRA-X40 loudspeaker can be suspended simply using M8 eye bolts. A minimum of two eye bolts are required when suspending a single loudspeaker. The use of two eye bolts provides the added flexibility of aiming and tilting the loudspeaker for targeted coverage. Meyer Sound offers a kit with 2 black-coated M8 x 13 mm eye bolts (PN 40.287.057.01).
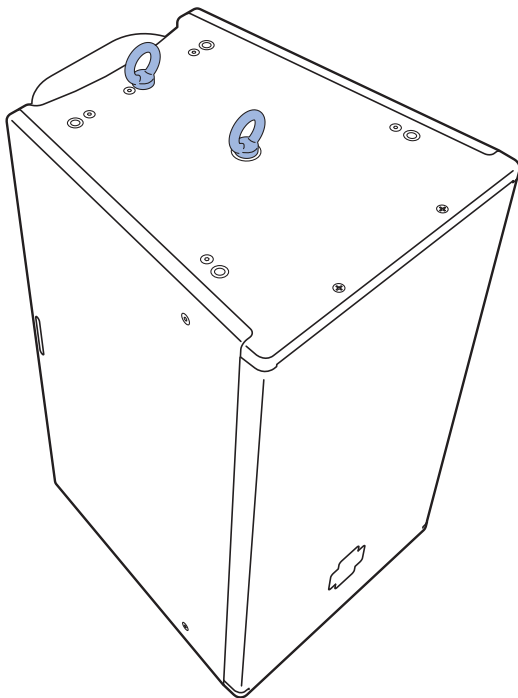
Figure 28: ULTRA-X40 with Two Eye Bolts

NOTE: Up to two ULTRA-X40 loudspeakers, oriented vertically, can be suspended with Meyer Sound eye bolts at a 5:1 safety factor. For this configuration, the top loudspeaker would have two eye bolts installed on its top and two eye bolts installed on its bottom (for connecting to the second loudspeaker), and the bottom of the upper loud-speaker requires the optional Thread Reducer M20 to M8 35MM accessory (PN 40.010.540.01, see Figure 43 on page 35).

POLE-MOUNTING THE ULTRA-X40

The MPK-POLE-35MM-M20 (PN 40.010.973.01) provides an easy and efficient way to mount the ULTRA-X40/42 on top of a 750-LFC (or 900-LFC). The MPK-POLE-35MM-M20 features all steel shafts that telescope from 36.5–60 inches and employs a secure knob to hold it in a specific position. The upper shaft includes the removable PAS-M20 Adapter Sleeve that fits the ULTRA-X40/42 internal 35 mm and M20 pole mount receptacle to make this connection more robust.

Meyer Sound offers the PAS-M20-35MM with M20 slug adapter sleeve separately (PN 40.010.974.01) for use with third-party 35 mm poles.

Removable M20 Slug

PAS-M20-35MM with M20 Slug Adapter Sleeve

35 mm to 38 mm adapter
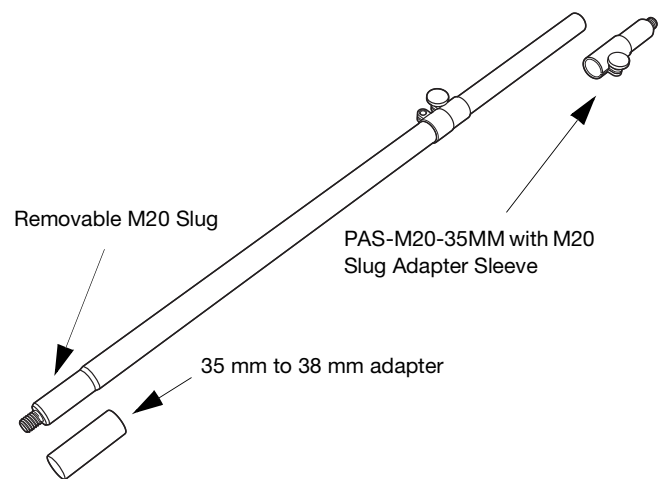
Figure 29: MPK-POLE-35MM-M20 kit

The MPK-POLE features a lift assist that provides approximately 40 lb of internal gas cylinder pneumatic lift. The lower end of the pole is 35 mm in diameter and has an M20 threaded lug for stability that can be removed if necessary. In addition, the MPK-POLE-35MM-M20 kit includes an adapter for converting the bottom diameter from 35 mm to 38 mm.

To remove the M20 threaded lug:

1. Locate the set screws on the Removable M20 Slug side of the pole.

2. Loosen the set screws using a 2.5 mm hex wrench. Do not loosen so far that the screws fall out of the pole and are lost (Figure 30).
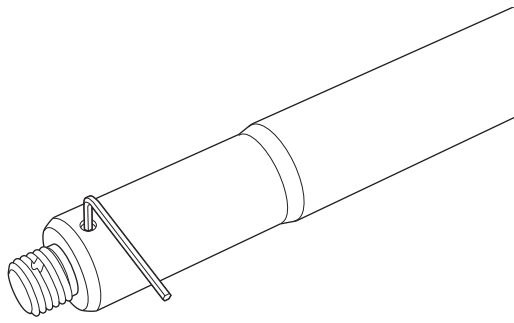
Figure 30: Using Hex Wrench to Loosen M20 Slug Set Screws

3. Loosen the M20 lug by rotating counter-clockwise (inserting a screwdriver through the lug can help with this process, see Figure 31) and remove it.
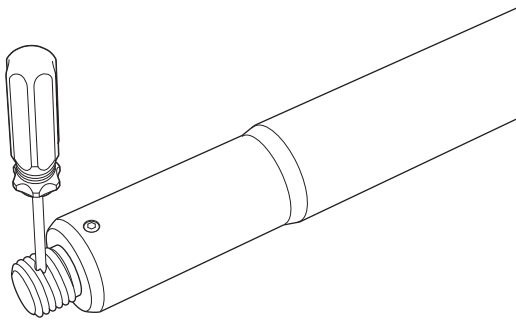
Figure 31: Inserting Screwdriver to Remove M20 Lug

4. Tighten the set screws enough to ensure they will remain in the pole (Figure 32).
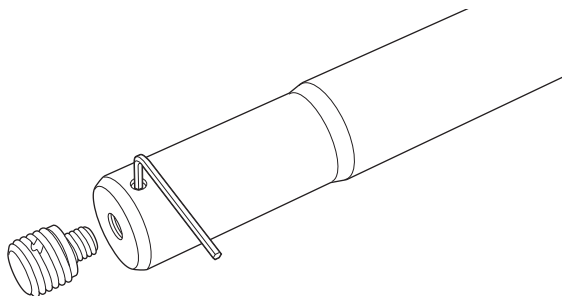
Figure 32: Pole with M20 Slug Removed

The pole can be used without the lug for loudspeakers that have 35 mm cup mounts without M20 threads, or the 35 mm to 38 mm adapter may be slipped onto the bottom for loudspeakers that have 38 mm cups (Figure 33).

35 mm to 38 mm Adapter Sleeve
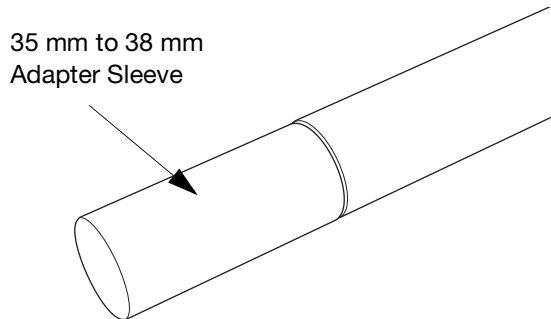
Figure 33: Pole with 35 mm to 38 mm Adapter Sleeve Attached

Meyer Sound recommends that a 750-LFC (or 900-LFC) be upgraded with the 35 mm/M20 internal pole mount cup (PN 40.271.016.02) for a more stable connection (Figure 34). This part is included with the MPK-POLE kit.

35 mm pole mount cup with M20 thread
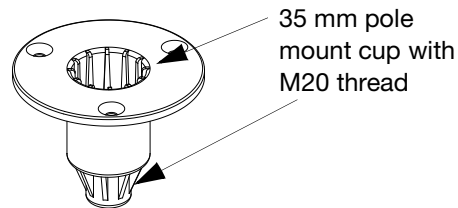
Figure 34: 35 mm/M20 Internal Pole Mount Cup (PN 40.271.016.02)

The PAS-M20-35MM Adapter is designed to securely fit into the M20 thread of the ULTRA-X4x integral pole mount. The separate knob on the adapter tightens it to the pole. (It can also be secured onto any other standard 35 mm pole.)

> 💡 **TIP:** Use the PAS-M20-35MM knob to secure the adapter to a pole when packing the pole for travel.

The PAS-M20-35MM may be independently (apart from the pole) threaded into the ULTRA-X4x (Figure 35), and then the loudspeaker/PAS-M20-35MM Adapter combination mounted onto a pole that is already secured in the subwoofer (Figure 36). The loudspeaker may be aimed horizontally, and the PAS-M20-35MM knob tightened.
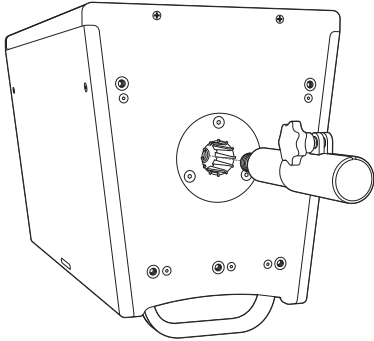
Figure 35: Inserting the PAS-M20-35MM Adapter Independently

Alternatively, the PAS-M20-35MM Adapter can be secured to the pole first and then the two items jointly inserted into the subwoofer mounting cup and tightened. The loudspeaker may then be lifted onto the PAS-M-20-35MM adapter and rotated until the M20 thread is tightened within the loudspeaker's mounting cup. Loosening the PAS-M20-35MM Adapter knob after the loudspeaker/PAS-M20-35MM Adapter M8 connection is secure can again facilitate horizontal aiming of the loudspeaker.
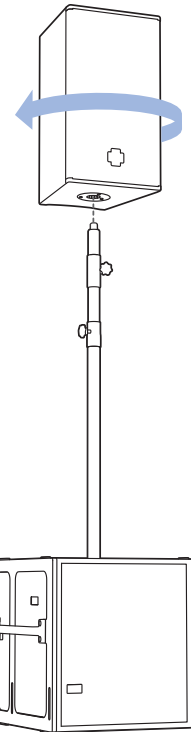
Figure 37: Rotating Loudspeaker onto PAS-M20-35MM

NOTE: The ULTRA-X40/42 integral pole mount adapter will receive any 35mm pole shaft. However, the use of the Meyer Sound MPK-Pole-35MM-M20 and the PAS-M20-35MM is recommended to make a more robust connection.

CAUTION: When using a third party pole, make sure the pole is designed to support the total weight of the ULTRA-X40/42 loudspeaker and observe all safety precautions specified by the pole manufacturer

Figure 36: Settling Loudspeaker/Adapter Combination onto Pole

THE MYA-X40 MOUNTING YOKE

The MYA-X40 mounting yoke (PN 40.287.039.01) suspends a single ULTRA-X40/42 loudspeaker and supports a wide range of horizontal and vertical adjustments. The yoke attaches to the top of the loudspeaker using three of the six rig nuts (Figure 39). The kit includes three M8 bolts and three M8 knobs. The bolts are recommended for fixed installations. A hanging clamp and steel safety cable (not included) are required to suspend the MYA-X40 mounting yoke.
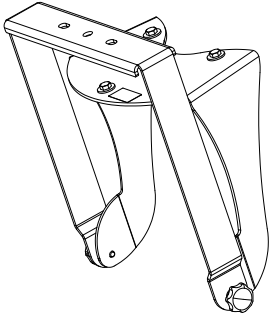
Figure 38: MYA-X40 Mounting Yoke
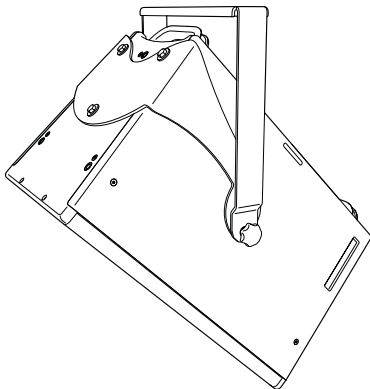
Figure 39: ULTRA-X40 in the MYA-X40 Yoke Mount

NOTE: The top bar of MYA-X40 mounting yoke accommodates hanging clamps with standard 1/2-inch or 12 mm bolts.

CAUTION: THE MYA-X40 Yoke is rated for a single loudspeaker. Never hang a second loud-speaker or other object underneath.

In addition, the yoke may be mounted onto a 35 mm pole using the optional MSA-STAND Adapter Cup 35MM (PN 40.086.013.01) to facilitate easy panning and tilting.
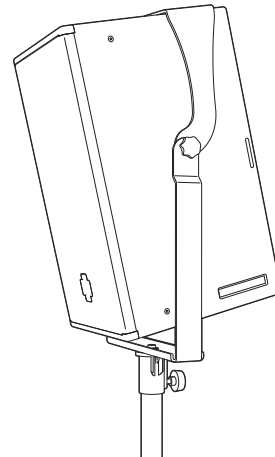
Figure 40: ULTRA-X40 in the MYA-X40 Yoke Mount on Pole using the optional MSA-STAND Adapter Cup 35MM
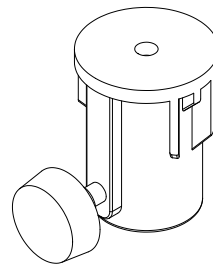
Figure 41: Optional MSA-STAND Adapter Cup 35MM

THE MUB-X40 U-BRACKET

The MUB-X40 U-Bracket (PN 40.287.055.01) allows a single ULTRA-X40/42 loudspeaker to be mounted to a wall in either vertical or horizontal orientations to the ceiling, onto the floor, or on top of a pole (Figure 48). Mounting the MUB-X40 U-Bracket onto a pole requires a pole mount adapter, such as the 35MM pole stand adapter shown in Figure 49 or the MSA-STAND adapter cup shown in Figure 41. The MUB-X40 kit includes two M8 bolts, two M8 knobs, and a 35 mm diameter, M20 to M8 thread size reducer. The bolts are recommended for fixed installations.
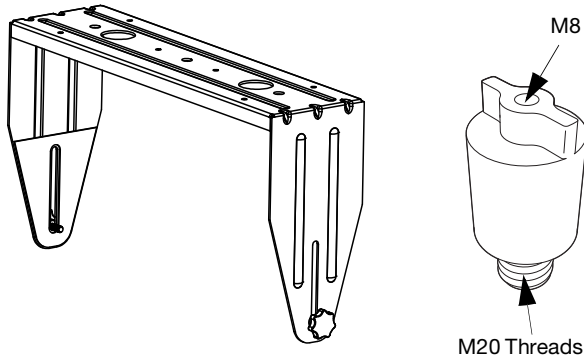
Figure 42: MUB-X40 U-Bracket (left) with Thread Reducer M20 to M8 (35MM) (right)

The reducer is needed to convert the cabinet's bottom built-in pole mount M20 internal threads to M8 size to install the MUB-X40 (Figure 43). The Thread Reducer M20 to M8 35MM can be installed and removed without the need of tools, and it can be conveniently transported on the M8 stud located on one side of the MUB-X40. The thread reducer is also available separately (PN 40.010.540.01).
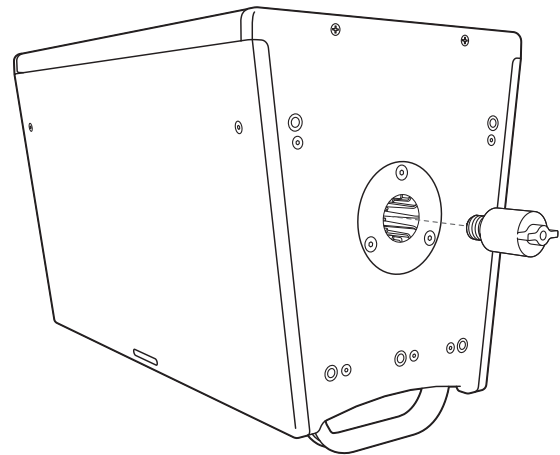
Figure 43: Converting ULTRA-X40/42 Cabinet to M8 size with Thread Reducer M20 to M8 (35 MM).

MUB-X40 U-Bracket Load Ratings

One ULTRA-X40/42 can be safely mounted with the MUB-X40 U-Bracket at a 5:1 safety factor.

When mounting an ULTRA-X40/42 with the MUB-X40 U-Bracket, the U-Bracket must be secured to the mounting surface with one of the configurations shown in Table 6 (for hole locations, see Figure 44 on page 36.

Table 6: Hole Mounting Configurations

Hole	Safety Factor
1/2-inch center hole	5:1
Two 1/2-inch outer holes	5:1
All four 1/4-inch corner holes	5:1
Two 1/4-inch center holes	Not rated for mounting. These holes are for pole-mounting the MUB-X40 using a pole-mount adapter. (See Figure 48 and Figure 49 on page 36.)

1/2-inch center hole

1/2-inch outer holes

1/4-inch corner holes

1/4-inch center holes
for a pole mount
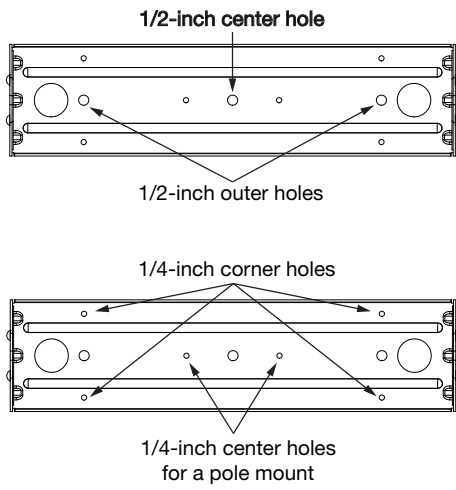
Figure 44: MUB-X40 Mounting Hole Configuration Locations
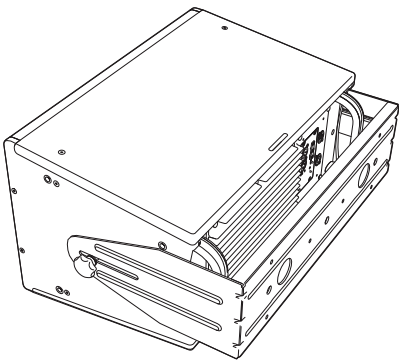
Figure 45: MUB-X40 Wall Mount, Horizontal
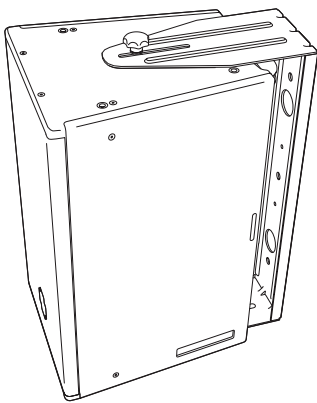
Figure 46: MUB-X40 Wall Mount, Vertical
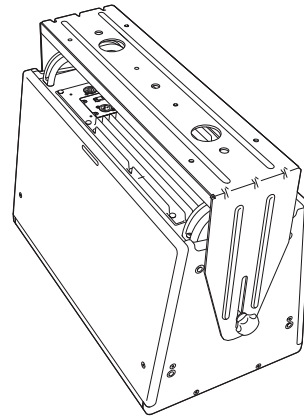
Figure 47: MUB-X40 Ceiling Mount
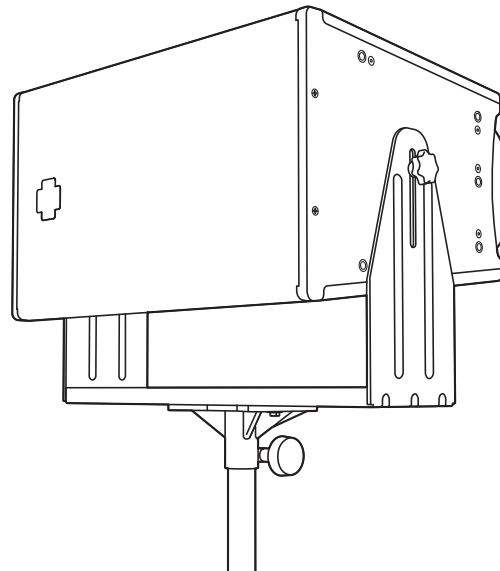
Figure 48: MUB-X40 Pole Mounted using the 35MM Pole Stand Adapter

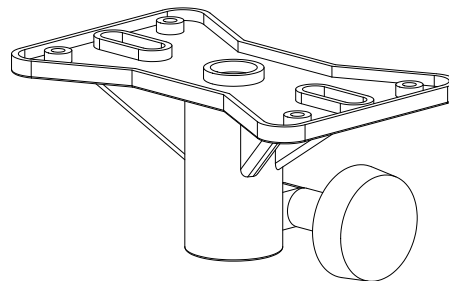*Figure 49: 35MM Pole Stand Adapter*

THE MTC-X40 TOP CHANNEL KIT

The MTC-X40 Top Channel kit (PN 40.287.130.01) includes a pinnable link in a channel that mounts directly to the ULTRA-X40/42 rig nuts or into an MCP plate. It supports pick-up of up to three ULTRA-X40/42 loudspeakers from a single point using the two included lock pins and 3/8-inch black shackle. The MTC-X40 Top Channel attaches to the speaker or to an MCP50-X40 or MCP70-X40 plate with two M8 bolts.
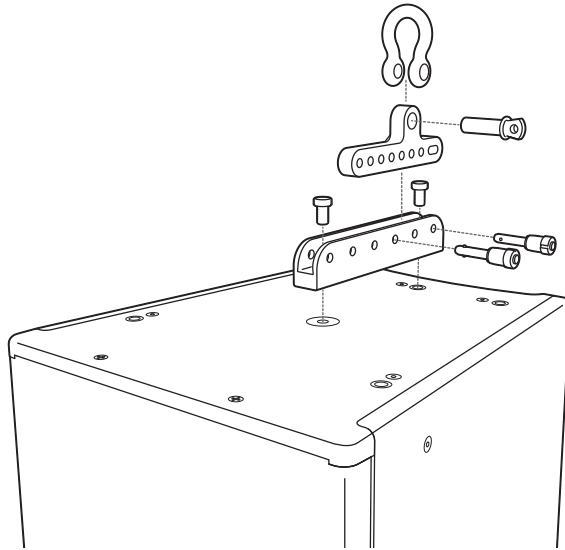
Figure 50: MTC-X40 Top Channel Kit Installed at Top of Cabinet

The versatile configuration of the channel and link, with the ability to slide the pinnable link within the channel, facilitates 9 different top pickup points (Figure 51). This flexibility allows for approximately +10° to –30° tilting of a loudspeaker that hangs from a single point.
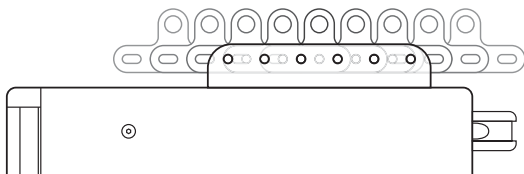
Figure 51: MTC-X40 Pickup Points

Using multiple versions of this kit (together with the Thread Reducer M20 to M8 35MM part sold separately) allows the user to create two- and three-loudspeaker angled configurations.

NOTE: Using multiple MTC-X40 Top Channel Links in a multi-loudspeaker configuration requires the use of the Thread Reducer M20 to M8 35MM on the bottom of each loudspeaker to which an MTC-X40 will attach (Figure 52).

MTC-X40 for Bottom of Upper Speaker

Thread Reducer M20 to M8 35MM

MTC-X40 for Top of Lower Speaker
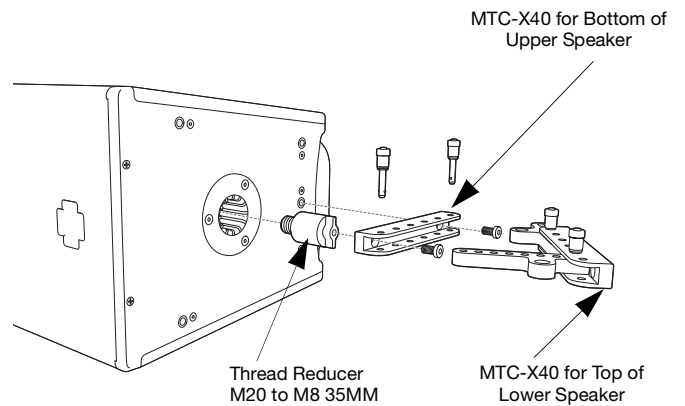
Figure 52: Attaching MTC-X40 to Bottom of Cabinet Requires Use of Thread Reducer M20 to M8 35MM

In the Figure 53 example, one Thread Reducer M20 to M8 35MM is required for the upper loudspeaker cabinet.
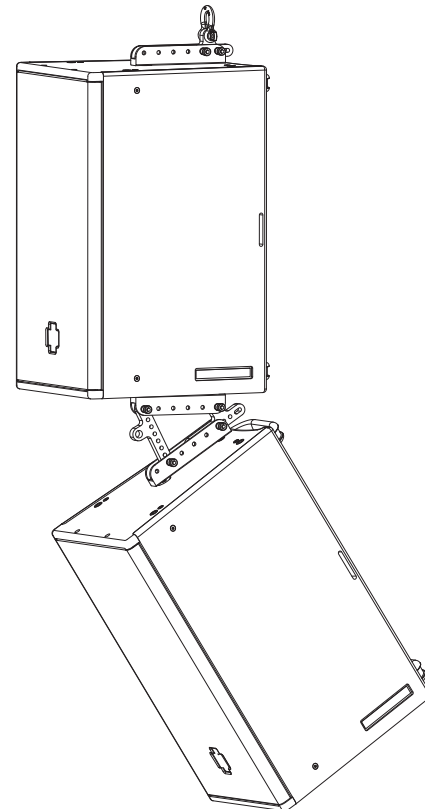
Figure 53: Example of two MTC-X40 Top Channels linking speakers at a 33° angle with a third MTC-X40 channel on top for pickup point.

⚠ **CAUTION:** A three-loudspeaker cluster using multiple MTC-X40 Top Channel Links requires the use of a pullback cable attached to an MTC-X40 Top Channel Link that is secured to the bottom of lowest loudspeaker (Figure 54).

📖 **NOTE:** In the Figure 54 example, three Thread Reducer M20 to M8 35MM parts are required—one for each loudspeaker cabinet bottom.
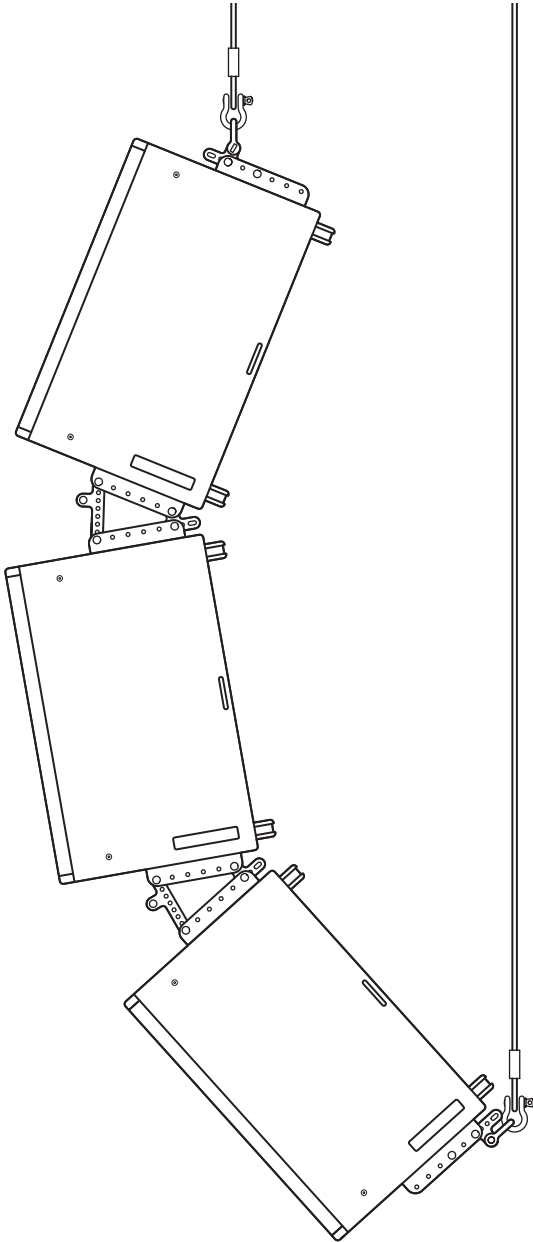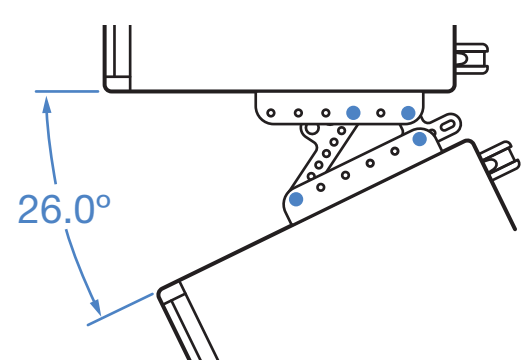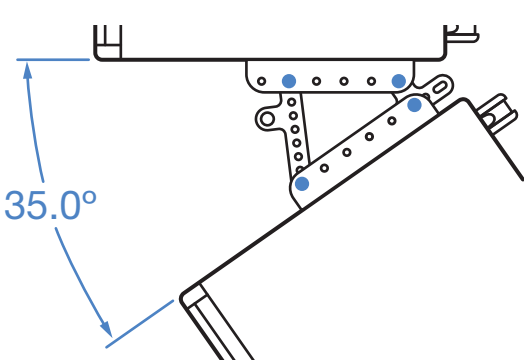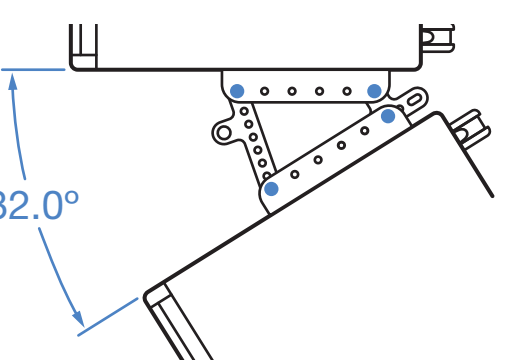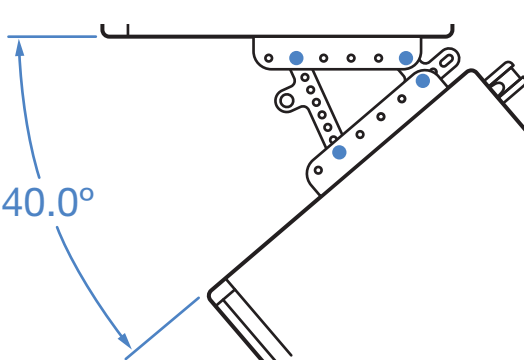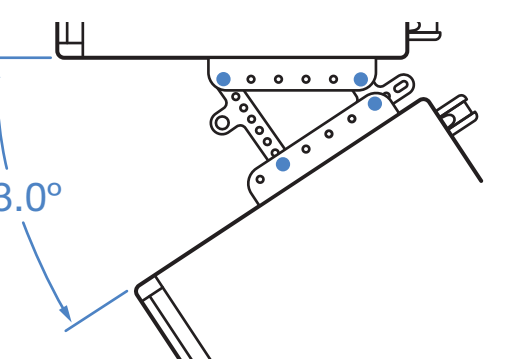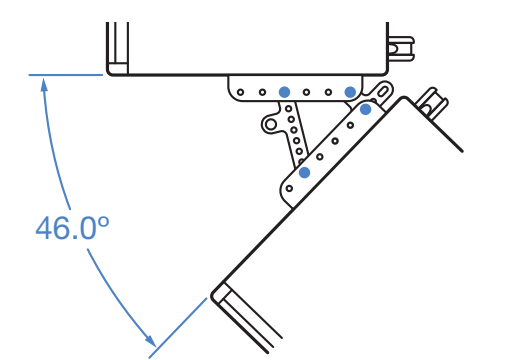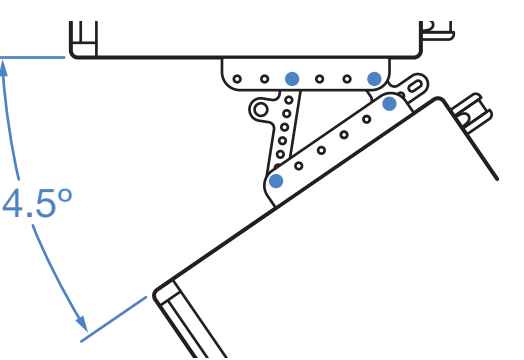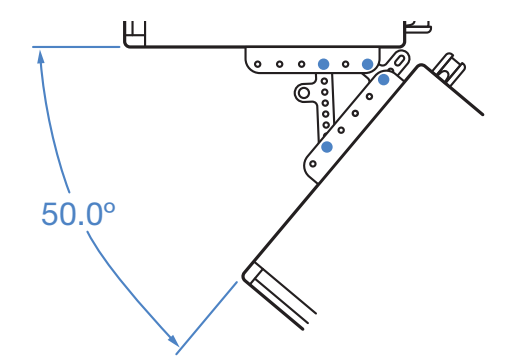
Figure 54: Three-ULTRA-X40/42 Cluster using MTC-X40s requires pullback cable

A variety of splay angles can be created between two speakers with MTC-X40 top channels in this configuration. Table 7 provides examples.

Table 7: MTC-X40 Link Splay Angle Illustrations

Channel and Link Splay Angles	
26.0°	35.0°
32.0°	40.0°
33.0°	46.0°
34.5°	50.0°

ULTRA-X40/42 OPERATING INSTRUCTIONS

THE MCP50-X40 AND MCP70-X40 CLUSTER PLATES

Meyer Sound offers two cluster plate versions: the MCP50-X40 Cluster Plate (PN 40.287.100.01), which when used in pairs, facilitates installation of up to three ULTRA-X40/42 loudspeakers in both horizontal and vertical clusters at variable splay angles between 10° and 50° in 5° increments, and the MCP70-X40 Cluster Plate (PN 40.287.400.01) that supports splay angles between 40° and 70°, also in 5° degree increments.
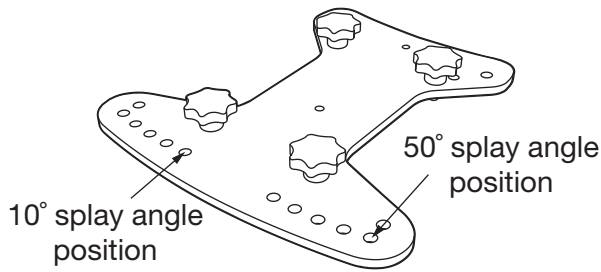
Figure 55: MCP50-X40 Cluster Plate (M8 knobs in transport positions)
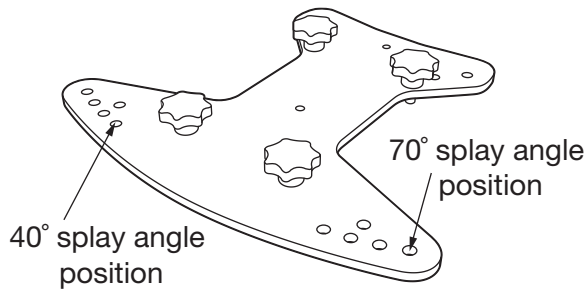
Figure 56: MCP70-X40 Cluster Plate (M8 knobs in transport positions)

These kits include four M8 bolts and four M8 knobs. The bolts are recommended for fixed installations, while the knobs are for portable applications. The MCP plates include four threaded positions to hold the M8 knobs during transport.

Using these cluster plates, along with the MTC-X40 Top Channel, or the MTB-X40 Top Bracket (see "The MTB-X40 Top Bracket" on page 44), users have the ability to create horizontal (Figure 57, Figure 58 and Figure 59) and vertical (Figure 64 and Figure 65) two and three speaker clusters.

Even splay angles are obtained by using symmetric holes on either side; odd splay angles use a wider position hole on one side of the cluster plate. See Table 8 for examples.

⚠ **CAUTION:** When making horizontal clusters, always use two plates—one on top and one on bottom—to splay two adjacent loudspeakers (two plates for two-loudspeaker clusters, four plates for three-loudspeaker clusters).

📖 **NOTE:** Optimal acoustical performance for an ULTRA-X40/42 array is achieved by using the adequate number of units as well as selecting the specific angles between cabinets to fill the requirements of the application. In general, larger angles can create a hole in the coverage and smaller angles can cause too much interaction.

💡 **TIP:** The MAPP System Design Tool, covered in greater detail in Chapter 7, is the method of choice to enable you to make accurate and comprehensive predictions for optimal coverage during the design phase.
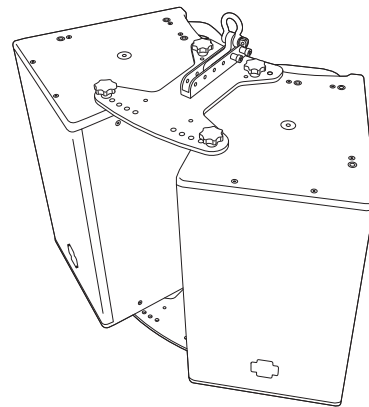

Figure 57: MCP50-X40 Cluster Plate shown in a 50° horizontal splay angle, two-loudspeaker cluster with MTC-X40 Top Channel on top
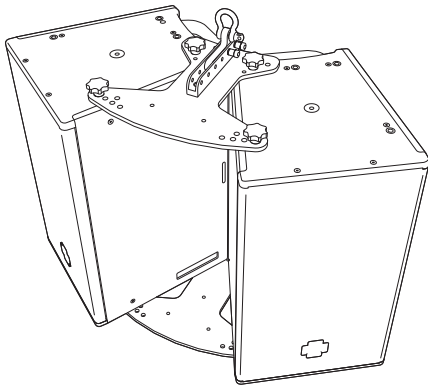
Figure 58: MCP70-X40 Cluster Plate shown in a 70° horizontal splay angle, two-loudspeaker cluster with MTC-X40 Top Channel on top

Table 8 provides illustrations of the type of splay angle configurations possible with two- and three-loudspeaker, horizontal and vertical configurations.

> **TIP:** Use MAPP to accurately predict the interaction of loudspeakers at different angles to ensure appropriate loudspeaker deployment and subwoofer integration. For more information, see "MAPP System Design Tool" on page 51.
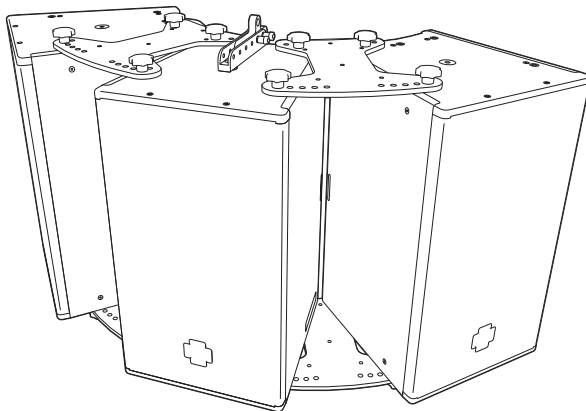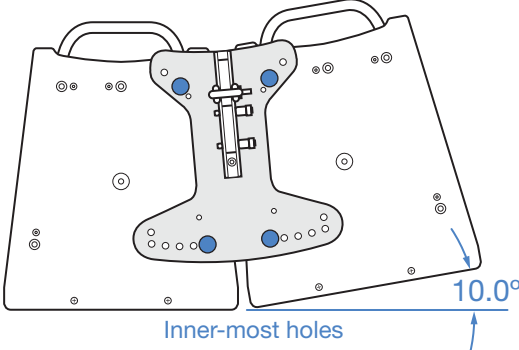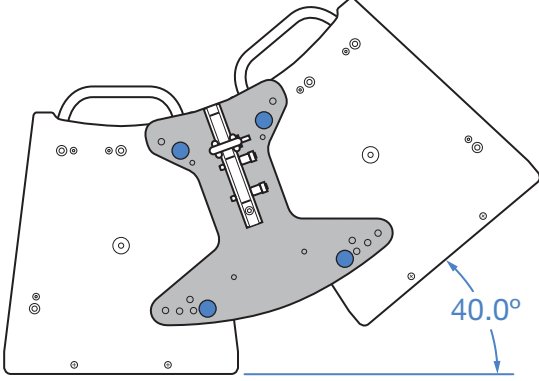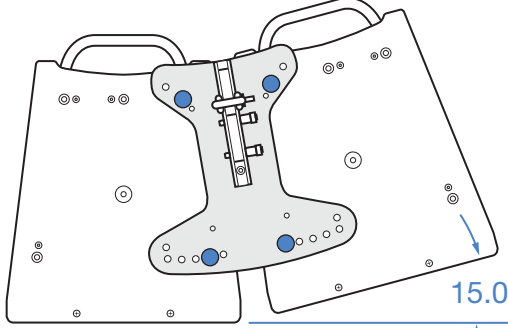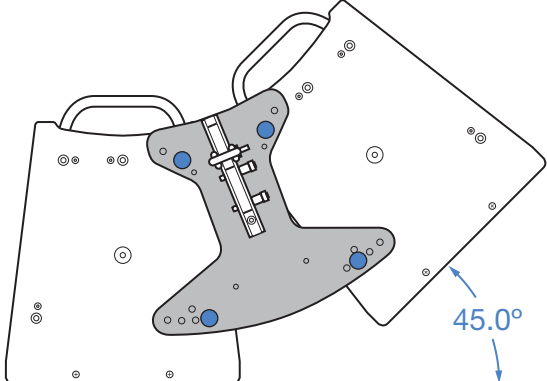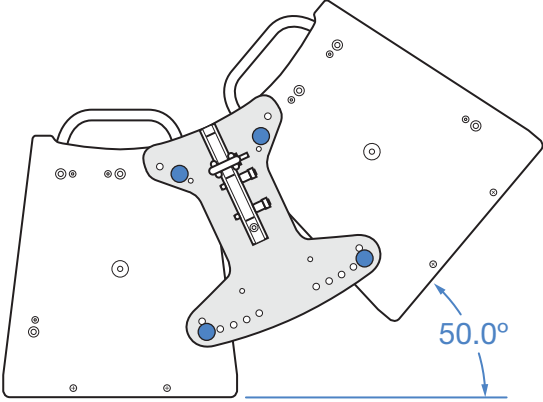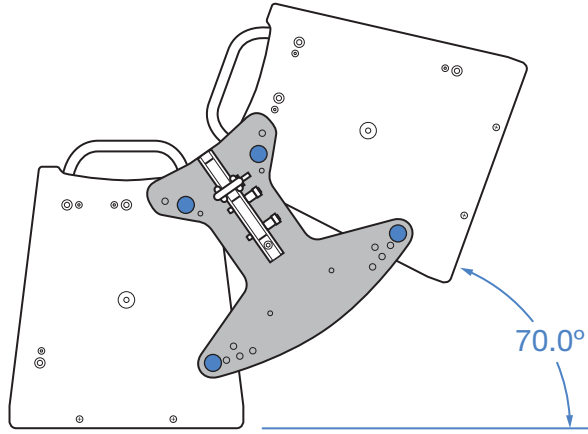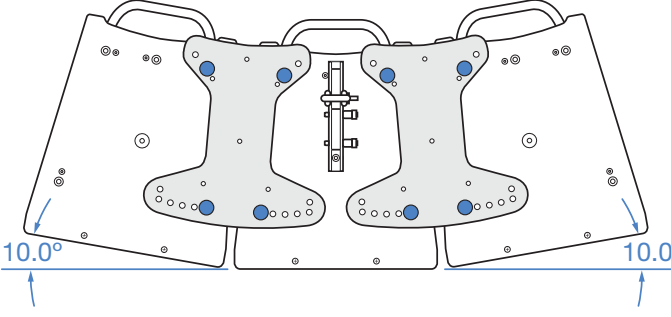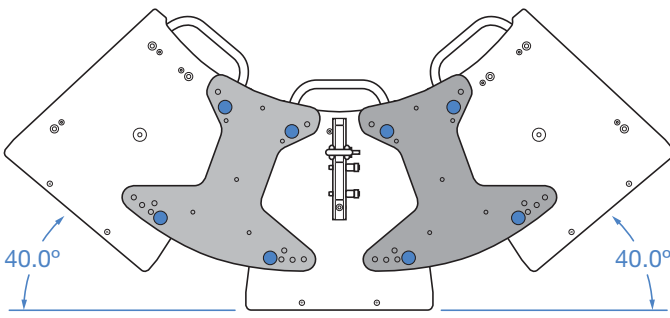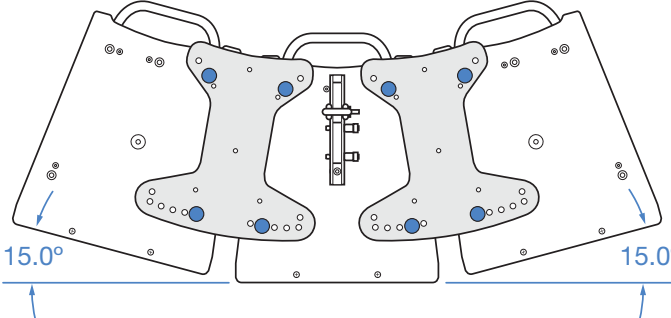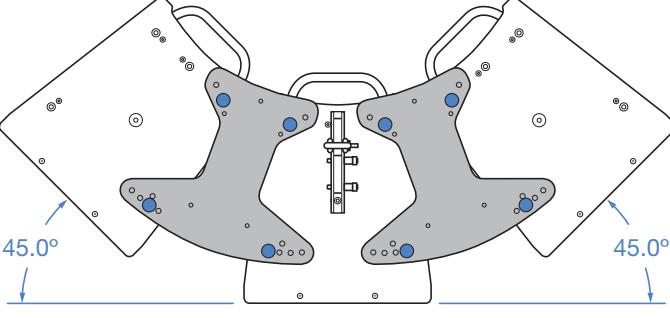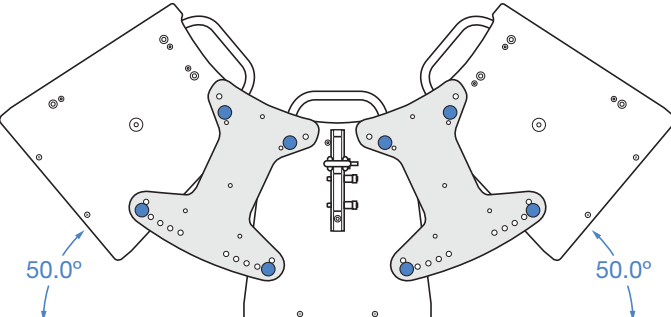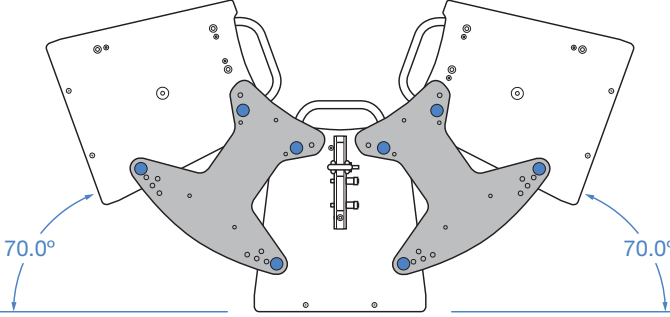

Figure 59: Four MCP50-x40 Cluster Plates shown set to 50° horizontal splay angles with MTC-X40 Top Channel for pick up point on center loudspeaker

Table 8: MCP50-X40 and MCP70-X40 Splay Angle Illustrations

MCP50-X40 Cluster Plate Examples	MCP70-X40 Cluster Plate Examples
10.0° Inner-most holes	40.0° Inner-most holes
15.0° 5˚ per single hole incremented (either side)	45.0° 5˚ per single hole incremented (either side)
50.0° Outer-most holes	70.0° Outer-most holes

Table 8: MCP50-X40 and MCP70-X40 Splay Angle Illustrations (Continued)

MCP50-X40 Cluster Plate Examples	MCP70-X40 Cluster Plate Examples
10.0° 10.0°	40.0° 40.0°
15.0° 15.0°	45.0° 45.0°
50.0° 50.0°	70.0° 70.0°

THE MTB-X40 TOP BRACKET

The MTB-X40 Top Bracket (PN 40.287.150.01) is a heavy duty, U-bracket style accessory that facilitates mounting of up to three ULTRA-X40/42 loudspeakers from a ceiling or truss. The kit includes four M8 bolts, and four M8 knobs.
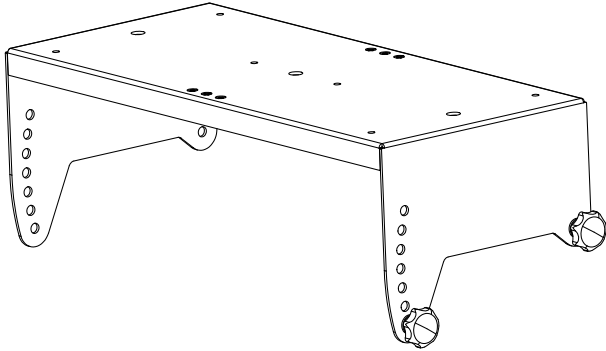
Figure 60: MTB-X40 Top Bracket

The bolts are recommended for fixed installations, while the knobs are for portable applications.

The design supports from 5° to 25° of downtilt in 5° increments (Figure 61). It supports 5° of uptilt (Figure 63). It also enables mounting of a single ULTRA-X40/42 onto the floor for front-fills.
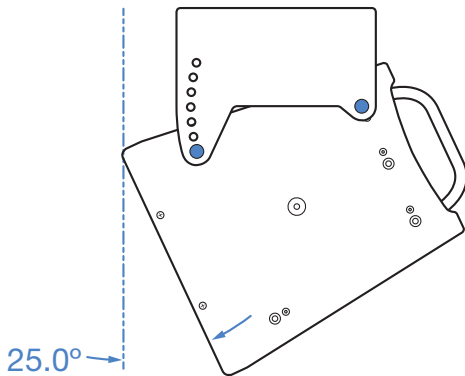
Figure 61: MTB-X40 Top Bracket set at 25° downtilt
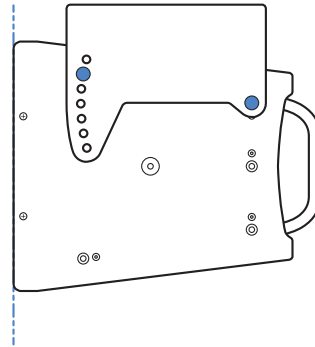
Figure 62: MTB-X40 Top Bracket set at 0°
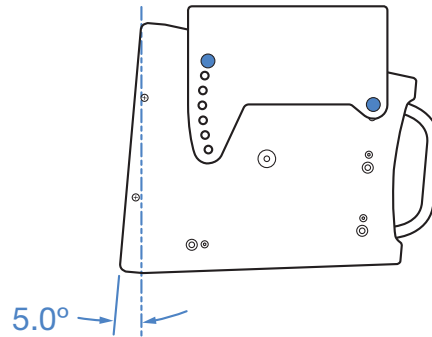
Figure 63: MTB-X40 Top Bracket set at 5° uptilt

The sturdy MTB-X40 Top Bracket can support up to three ULTRA-X40/42 loudspeakers in a vertical cluster (Figure 64 and Figure 65) when used in conjunction with either of the MCP50-X40 or the MCP70-X40 Cluster Plates. Two plates (one kit) are required for two-speaker clusters. Four plates (two kits) are required for three-speaker clusters.
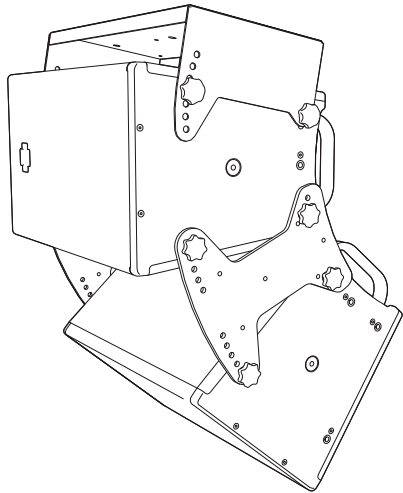
Figure 64: MCP50-X40 Cluster Plate creates a 50° vertical splay angle cluster with the MTB-X40 Top Bracket on top set at 10° angle
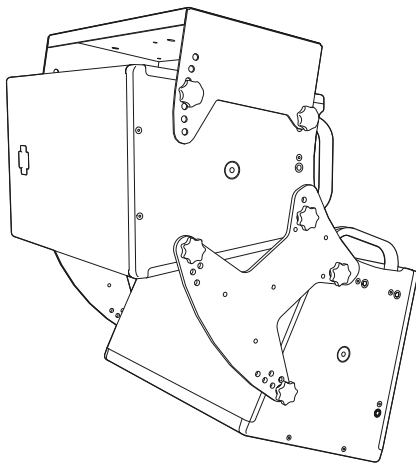
Figure 65: MCP70-X40 Cluster Plate creates a 70° vertical splay angle cluster with the MTB-X40 Top Bracket on top set at 10° angle

⚠️ **CAUTION:** When making vertical clusters, always use two plates—one on the left and one on the right—to splay two adjacent loudspeakers (two plates for two-loudspeaker clusters, four plates for three-loudspeaker clusters).

The splay angles created by the cluster plate configurations as illustrated in Table 8 apply to vertical clusters as well. Figure 66, Figure 67 and Figure 68 provide representative drawings in the vertical orientation to illustrate.
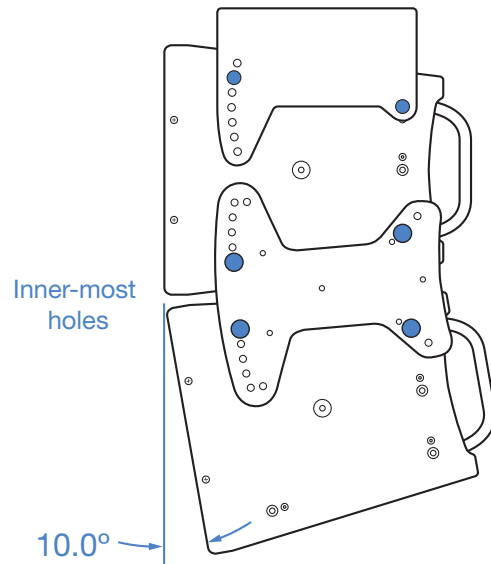
Figure 66: MCP50-X40 Cluster Plate in 10° vertical splay angle
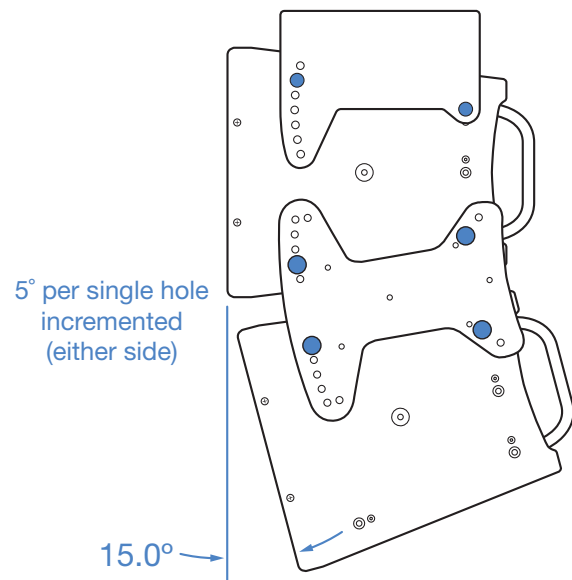
Figure 67: MCP50-X40 Cluster Plate in 15° vertical splay angle
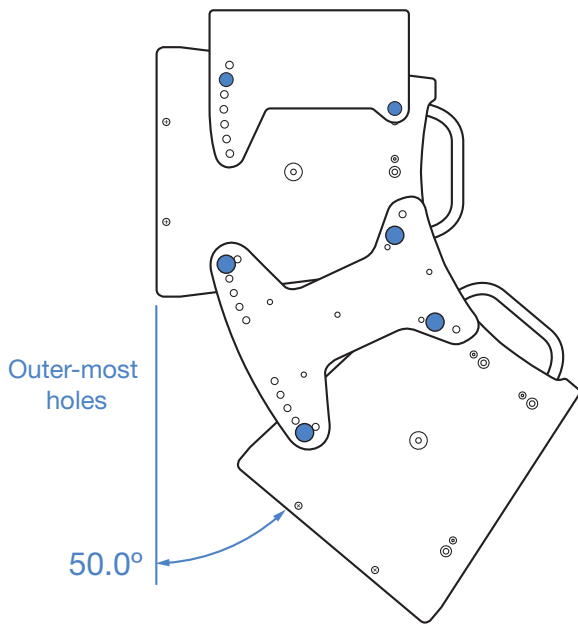
Figure 68: MCP50-X40 Cluster Plate in 50° vertical splay angle

⚠ **CAUTION:** When mounting the MTB-X40 from the Center hole (Figure 69), a maximum of two loudspeakers maybe clustered.

⚠ **CAUTION:** When making three-loudspeaker vertical clusters using the MTB-X40, the MTB-X40 must always be horizontal (0°) with respect to the floor.

⚠ **CAUTION:** For three-loudspeaker clusters, there are BGV-C1 limitations on the maximum angles between the MTB-X40 and the first loud-speaker, and on the angles between the first/second and second/third loudspeakers. See Figure 69, Figure 70, Table 9 and Table 10.
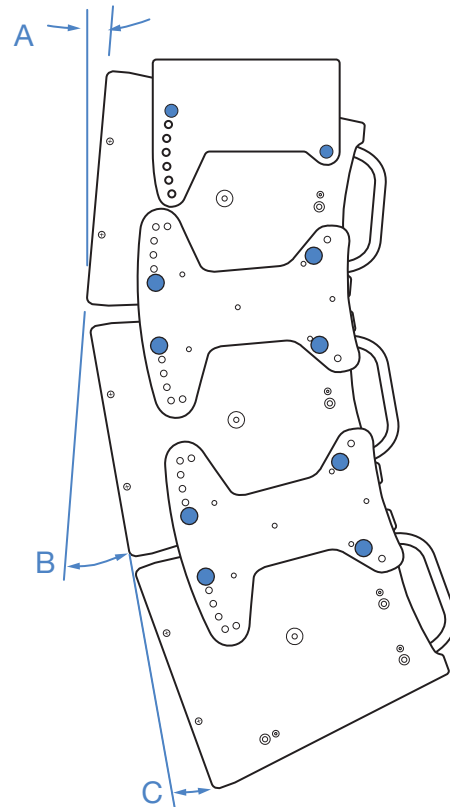
Figure 70: Three-ULTRA-X40 vertical cluster angles

Center Hole (maximum two-loudspeaker cluster)
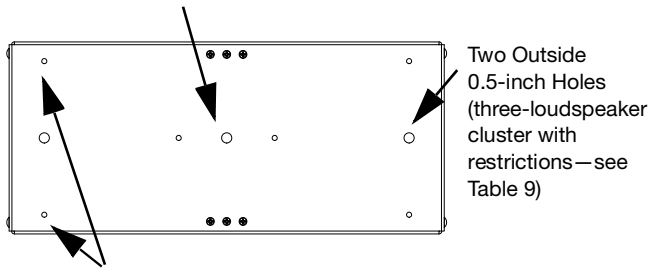
Two Outside 0.5-inch Holes (three-loudspeaker cluster with restrictions—see Table 9)

Four Outside Fixed Installation Mounting Holes (three-loudspeaker cluster with restrictions—see Table 10)

Figure 69: MTB-X40 (top side) mounting hole options

Table 9: Permissible Angle Combinations—Two Outside 0.5-inch Holes—for Three-Loudspeaker Clusters

A	B	C
+5°	-10° to -35°	No restrictions
	-40°	-10° to -55°
	-45°	-10° to -40°
	-50° to -70°	3rd loudspeaker not allowed
0°	-10° to -25°	No restrictions
	-30°	-10° to -60°
	-35°	-10° to -35°
	-40° to -70°	3rd loudspeaker not allowed
-5°	-10° to -15°	No restrictions
	-20°	-10° to -60°
	-25°	-10° to -40°
	-30°	-10° to -30°
	-35° to -70°	3rd loudspeaker not allowed
-10° to -25°	All angles	3rd loudspeaker not allowed

Table 10: Permissible Angle Combinations—Four Outside Fixed Installation Mounting Holes—for Three-Loudspeaker Clusters

A	B	C
+5°	All angles	No restrictions
0°	All angles	No restrictions
-5°	-10° to -55°	No restrictions
	-60°	-10° to -45°
	-65°	-10° to -35°
	-70°	3rd loudspeaker not allowed
-10°	-10° to -45°	No restrictions
	-50°	-10° to -45°
	-55°	-10° to -35°
	-60° to -70°	3rd loudspeaker not allowed
-15°	-10° to -30°	No restrictions
	-35°	-10° to -65°
	-40°	-10° to -45°
	-45°	-10° to -30°
	-50° to -70°	3rd loudspeaker not allowed
-20°	-10° to -20°	No restrictions
	-25°	-10° to -65°
	-30°	-10° to -45°
	-35° to -70°	3rd loudspeaker not allowed
-25°	All angles	3rd loudspeaker not allowed

NOTE: Optimal acoustical performance for an ULTRA-X40/42 array is achieved by using the adequate number of units as well as selecting the specific angles between cabinets to fill the requirements of the application. In general, larger angles can create a hole in the coverage and smaller angles can cause too much interaction.

TIP: The MAPP System Design Tool, covered in greater detail in Chapter 7, is the method of choice to enable you to make accurate and comprehensive predictions for optimal coverage during the design phase.

CHAPTER 6: RMS REMOTE MONITORING SYSTEM

The ULTRA-X40/42 loudspeaker optionally includes an RMS remote monitoring system module, allowing it to be connected to an RMS network. RMS reports, in real time, the status and power usage of multiple Meyer Sound loudspeakers from a Mac® or Windows®-based computer. The RMServer™ communicates with Meyer Sound loudspeakers equipped with RMS modules. RMServer is a compact, Ethernet-based hardware unit with two FT-10 RMS data ports. RMServer stores system configurations internally, eliminating most manual data entry. Systems can be monitored from a computer at front-of-house or backstage, or from a laptop anywhere within the venue over WiFi.

> **NOTE:** For the latest RMS system requirements, visit the Meyer Sound website (meyersound.com).

> **NOTE:** RMS does not control AC power.

COMPASS RMS SOFTWARE

Compass RMS™ software provides extensive system status and performance data for each loudspeaker, including amplifier voltage, limiting activity, power output, fan and driver status, as well as mute and solo capability. Loudspeakers are added to the RMS network and assigned a node name during a one-time discovery procedure. Once loudspeakers are identified on the RMS network, they appear in Compass RMS as icons that can be customized to suit your needs (Figure 71).
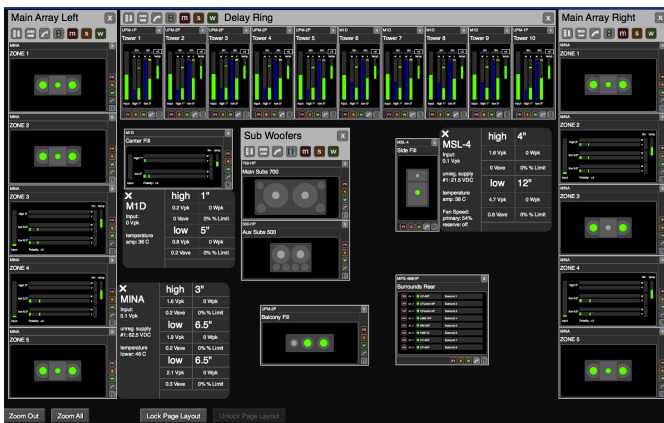
Figure 71: Compass RMS Window

Individual loudspeakers can be physically identified with the Wink option in RMS, which lights the Wink LED on the RMS module of that particular loudspeaker. Conversely, a loudspeaker can be identified in Compass RMS by pressing the Identify button on the loudspeaker's RMS module.

Loudspeaker icons can be arranged in Compass RMS and saved as pages to represent how the loudspeakers have been deployed in the system. Multiple pages can be saved and recalled for specific performances and venues.

RMS MODULE

The ULTRA-X40/42 RMS user panel (Figure 72) includes an Identify button, Remote Mute switch, Wink/Activity LED, and two Network connectors.
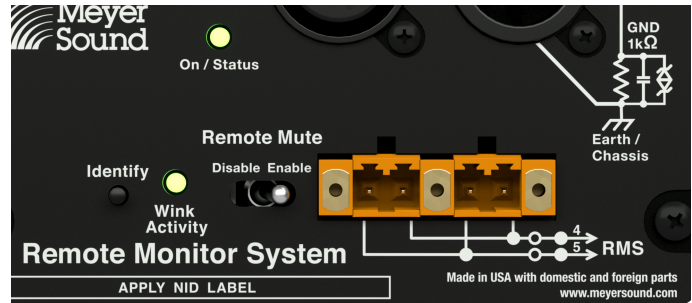
Figure 72: ULTRA-X40/42RMS Module

> **NOTE:** The Identify button and Wink/Activity LED on the RMS user panel are used exclusively by RMS and have no effect on the acoustical or electrical activity of the loudspeaker.

Identify Button

The Identify button serves the following functions:

- If the loudspeaker has not yet been discovered on the RMS network (Wink/Activity LED not lit), press the Identify button to discover it.

- To remove the loudspeaker from the RMS network, press and hold the Identify button during startup (see "Resetting the RMS Module" on page 50).

- To *wink* a discovered loudspeaker, press the Identify button. The Wink LED on the loudspeaker icon in Compass RMS lights up and the Wink/Activity LED on the loudspeaker's RMS user panel turns solid green. Press the Identify button again to unwink the loudspeaker.

TIP: The loudspeaker can also be winked by clicking the Wink button on the loudspeaker icon in Compass RMS.

Wink/Activity LED (Green)

The green Wink/Activity LED indicates the status of the loudspeaker:

- During startup, the LED flashes green 10 times.

- If the loudspeaker has not yet been discovered on the RMS network, the LED is not lit after startup.

- If the loudspeaker has been successfully discovered on the RMS network, the LED flashes green continuously and flashes more rapidly with increased data activity.

- When the loudspeaker is winked, either by clicking the Wink button in Compass RMS or by pressing the Identify button on the RMS user panel, the LED is solid green. The LED remains solid green until the loudspeaker is unwinked.

TIP: The Wink function is useful for identifying the physical loudspeaker corresponding to a loudspeaker icon in Compass RMS.

Remote Mute Switch

The recessed Remote Mute switch on the ULTRA-X40/42 RMS module (Figure 73) determines whether Compass RMS can control muting and soloing of the loudspeaker. The ULTRA-X40/42 ships from the factory with the switch enabled.
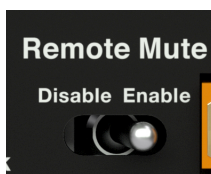
Figure 73: Remote Mute Switch

- **Disable:** When the Remote Mute switch is set to Disable (to the left), the loudspeaker cannot be muted or soloed from Compass RMS.

- **Enable:** When the Remote Mute switch is set to Enable (to the right), the loudspeaker can be muted and soloed from Compass RMS.

NOTE: Compass RMS has a preference that can be set to disable Mute and Solo functions, eliminating any possibility of accidentally muting loudspeakers.

RMS Network Connectors

The Weidmuller 2-conductor, locking connectors transfer data to and from the RMS network. Two connectors are provided to allow for easy connection of multiple (daisy-chained) loudspeakers on the network. Included with each RMS-equipped loudspeaker are RMS cable connectors and mounting blocks for constructing RMS cables. The mounting blocks allow the Weidmuller connectors to be securely attached to the RMS module with screws.

NEURON ID FOR RMS MODULE

Each RMS module has a unique 12-character Neuron ID (NID) that identifies the loudspeaker on the network. The NID is automatically detected by RMServer but can also be entered manually, if necessary, when configuring RMS systems in Compass RMS without loudspeakers present. The NID label is located on the RMS user panel near the orange Network connectors.

RESETTING THE RMS MODULE

You can use the Identify button to reset the ULTRA-X40/42 RMS module when powering on the loudspeaker. This action will cause the module to be removed from the RMS network.

To reset the RMS module:

1. Power down the loudspeaker.

2. Press and hold the Identify button.

3. While continuing to hold down the Identify button, power on the loudspeaker.

4. After the Wink/Status LED flashes on and off, release the Identify button. The RMS module is reset and the loudspeaker is removed from the RMS network.

CHAPTER 7: SYSTEM DESIGN AND INTEGRATION TOOLS

This chapter introduces MAPP, Meyer Sound's patented system design tool and the Galileo GALAXY Network Platform.

MAPP SYSTEM DESIGN TOOL

The MAPP System Design Tool (Figure 74) is a powerful, cross-platform application for accurately predicting the coverage pattern, frequency response, phase response, impulse response, and SPL capability of individual or arrayed Meyer Sound loudspeakers.

Figure 74: MAPP System Design Tool

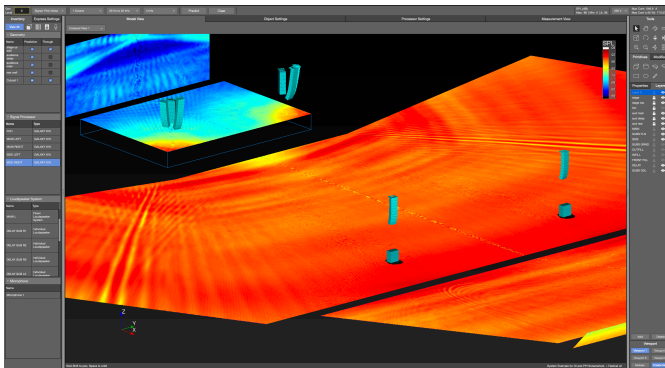Whether planning for fixed installations or for tours with multiple venues, use MAPP to accurately predict the appropriate loudspeaker deployment for each job, complete with coverage data, system delay and equalization settings, rigging information, and detailed design illustrations. MAPP's accurate, high-resolution predictions ensure that systems will perform as intended, thereby eliminating unexpected coverage problems and minimizing onsite adjustments.

The key to the accuracy of MAPP's predictions is Meyer Sound's exhaustive database of loudspeaker measurements. Performance predictions for each loudspeaker are based on 3-dimensional, 65,000+ 1/48th-octave-band measurements taken in the Meyer Sound anechoic chamber. The extraordinary consistency between Meyer Sound loudspeakers guarantees that predictions from MAPP will closely match their actual performance.

MAPP software allows for configuration of Meyer Sound loudspeaker systems and definition of the environment in which they operate, including air temperature, pressure, humidity, and the location of prediction surfaces. Importing both CAD (.DXF) and Sketchup (.SKP) files containing detailed venue information to act as an anchor model to the prediction surfaces and a visual aid to facilitate prediction data interpretation is also possible.

> **TIP:** See meyersound.com for more information about and support for MAPP.

MAPP Capabilities

With MAPP, the user can:

- Simulate different loudspeaker configurations to refine system designs and determine the best coverage for intended audience areas

- Model loudspeaker interactions to locate constructive and destructive interferences so that loudspeakers can be re-aimed and repositioned as necessary

- Place microphones anywhere in the Model View space and predict loudspeaker frequency response, phase response, and sound pressure levels at each microphone position

- Determine delay settings for fill loudspeakers using the Inverse Fast Fourier Transform and phase response feature

- Preview the results of signal processing to determine optimum settings for the best system response

- Automatically calculate load information for arrays to determine necessary minimum rigging capacity, front-to-back weight distribution, and center of gravity location

- Generate and export system images and system PDF reports for client presentations

- Synchronize GALAXY processor output channel settings in real time with virtual or real GALAXY units, allowing in-the-field changes to be predicted during system alignments.

GALILEO GALAXY NETWORK PLATFORM

The Galileo GALAXY Network Platform is a sophisticated loudspeaker management tool for controlling all Meyer Sound speaker types. The GALAXY loudspeaker processor extends a high level of audio control in driving and aligning loudspeaker systems with multiple zones. It provides a powerful tool set for corrective equalization (EQ) and creative fine-tuning for a full range of applications from touring to cinema.

Users can readily program the GALAXY processor using Compass software running on a host computer or via the Compass Go application for the iPad. Connecting MAPP to the GALAXY processor will also allow the user to push output channel settings created in MAPP as a starting point. Compass Control Software includes custom-designed settings for each family of speakers, as well as to integrate families together. For example, the Product Integration feature matches the phase characteristics between Meyer speaker families to ensure the most coherent summation.

Processing tools for inputs and outputs include delay, parametric EQ and U-Shaping EQ. Output processing also includes polarity reversal, Low-Mid Beam Control (LMBC), atmospheric correction, and All Pass filters.

The built-in summing and delay matrices allow a user to easily assign gain and delay values, respectively, at each cross point. This capability greatly facilitates using one loudspeaker to satisfy multiple purposes.

Front panel controls let a user intuitively and quickly operate a GALAXY processor without a computer during live use.

The GALAXY 408, GALAXY 816 and GALAXY 816-AES3 processor versions have the same audio processing capability with different I/O.
Visit meyersound.com/documents to locate their datasheets for more information.

APPENDIX A: MEYER SOUND WEATHER PROTECTION

The Weather Protection option from Meyer Sound is intended to increase the useful life of Meyer Sound loudspeakers when they are installed outdoors and exposed to different and often harsh weather conditions. Meyer Sound Weather Protection includes a penetrating treatment to raw wood, use of special primers, and plating on all steel parts used (or alternatively, the use of stainless steel hardware). Weather Protection is designed to prevent malfunctions caused by harsh operating environments and slows the accelerated wear and tear that occurs in outdoor environments.

When Is Weather Protection Advisable?

Weather Protection is strongly recommended for all permanent outdoor installations where loudspeakers are directly exposed to the elements. This recommendation includes desert and semi-arid climates, where protection against dust and sand is important, and where infrequent rainstorms can contribute to deterioration of loudspeaker components.

Weather Protection is also recommended when the loudspeakers are sheltered from direct exposure to precipitation, but are nevertheless exposed to prolonged high humidity, fog or mist. Examples would be installations on covered outdoor terraces or pavilions.

Weather Protection is further advisable for portable or touring systems when any significant outdoor use is anticipated. Even though standard procedures may call for using external protective measures, these are often not implemented in time to prevent moisture intrusions that could lead to premature performance degradation of the loudspeaker.

Climate Variation and Owner Maintenance

The wear and tear on a loudspeaker will vary significantly with different climatic conditions. For example, a weather-protected loudspeaker installed in a sunlight-exposed location on an ocean pier will experience much harsher conditions than a loudspeaker in a similar installation that is shaded by trees and exposed only to rainfall. The constant exposure to direct UV radiation and a salt air environment will cause a loudspeaker to wear more quickly than one with partial UV shielding and exposed only to freshwater moisture.

Wear can eventually affect the performance of the loudspeaker. It also affects aesthetics. For example, in salt air environments, the exterior grille can quickly show signs of oxidation, causing unsightly discoloration.

Apart from selecting suitable weather protection, the progress of wear and tear on the loudspeaker can be slowed by a regular schedule of inspection and cleaning. This maintenance is particularly necessary in harsh environments. Inspection and cleaning should include routine removal of any visible oxidation or environmental particulates, as these can accelerate metal corrosion or decay of the cabinet. If installed loudspeakers are not in use for an extended period, exterior protection or temporary removal and storage of the loudspeakers should be considered.

Benefits of Weather Protection

There are several benefits to selecting the Meyer Sound Weather Protection option:

Functionality—Weather Protection prolongs the service life of the loudspeaker by preventing premature degradation of internal components.

Safety—Weather Protection lessens the chance of electrical malfunctions or structural failures.

⚠️ **WARNING:** IT IS THE RESPONSIBILITY OF PURCHASERS/USERS/OPERATORS TO SELECT WEATHER PROTECTION WHEN APPROPRIATE FOR THEIR USE AND TO PERIODICALLY INSPECT THEIR LOUDSPEAKER INSTALLATIONS FOR ANY DETERIORATION THAT MAY LEAD TO SAFETY CONCERNS.

Aesthetics—Weather Protection slows wear and tear on the exterior of the loudspeaker in harsh conditions. Early signs of wear and tear on the exterior of the loudspeaker indicate over-exposure to the elements.

Standards Compliance—Weather Protection helps in meeting IP ratings for loudspeakers. IP ratings are an internationally recognized standard often used in installations involving our products. A further explanation of IP ratings is given in the "IP Ratings" Section on page 55.

WEATHER PROTECTION COMPONENTS

Standard Weather Protection

Meyer Sound designs toward an IP rating of IPX4 (see "IP Ratings" on page 55) for Standard Weather Protection, which includes the following components:

- Wood treatment—Prior to cabinet manufacturing, the raw wood receives a special treatment that penetrates and stabilizes the wood fibers to withstand a wide range of temperatures and exposure to extreme humidity.

- Cabinet finishing—The assembled cabinets receive a highly impervious finish that includes a sealing primer and a finishing topcoat. The coatings are applied on both surfaces, with one coat on the interior and two on the exterior. The final step is a two-part modified acrylic urethane similar to that used in military applications.

- Driver treatment—All cone drivers are coated with a water-resistant sealant.

- Exterior protection—Grille frames are coated to resist corrosion, and all components that mount to the cabinet use custom gaskets and stainless steel fasteners.

- Removable rain hood—The rain hood is designed to shield connectors even in wind-driven rain.

INSTALLATION PRACTICES

Meyer Sound assumes normal and accepted installation practices are used when installing Meyer Sound Loudspeakers outdoors. Deviation from such practices may cause weather protection to be ineffective and void the warranty for the loudspeaker.

Examples of unacceptable and acceptable installation practices include:

- Loudspeakers installed outdoors should not face upward.

- Loudspeakers with a rain hood should be installed in such a way that the rain hood opening is not facing any direction but down.

- Meyer Sound-supplied rigging components should not be modified (for example, by drilling additional holes in a MUB for mounting to a wall). When an installer/integrator modifies a Meyer Sound supplied rigging component to support their installation method, it is considered compromised and out of warranty.

- All loudspeaker cabling must be installed with a "drip-loop" or equivalent method to ensure that rain or water is NOT wicked toward the loudspeaker.

If in doubt about an installation method, contact Meyer Sound Technical Support for assistance.

Always discuss the environmental conditions of your Meyer Sound installation with your Sales Manager, and verify the availability of Weather Protection for your selected loudspeaker models. The Sales Manager, together with Technical Support, will verify the appropriate level of weather protection for the loudspeakers and related rigging hardware.

IP RATINGS

IP stands for "Ingress Protection." The current format for expressing an IP rating is a 2-digit code. The first digit of an IP rating represents protection from solid objects. The second digit of an IP rating represents protection from water or moisture. Table 11 provides a chart of IP ratings and the corresponding definitions of the rating.

> **NOTE:** IP ratings only apply to the "ENCLOSURE." A loudspeaker is considered an enclosure and as such we can apply an IP rating to it. Rigging hardware is not an enclosure and therefore IP ratings do not apply. Also, cable and cable-mount connectors used to connect to the loudspeaker are NOT part of the enclosure and therefore not part of the IP rating. Only the chassis-mounted part of the connector is considered part of the enclosure.

Table 11: IP Ratings Definition Chart

First Digit (Protection against solid objects)	Definition	Second Digit (Protection against liquids)	Definition
X	Characteristic numeral is not required to be specified.	X	Characteristic numeral is not required to be specified.
0	No protection.	0	No protection.
1	Protected against solid objects over 50 mm.	1	Protected against vertically falling drops of water.
2	Protected against solid objects over 12 mm.	2	Protected against direct sprays up to 15° from the vertical.
3	Protected against solid objects over 2.5 mm.	3	Protected against direct sprays up to 60° from the vertical.
4	Protected against solid objects over 1 mm.	4	Protected against direct sprays from all directions. Limited ingress permitted.
5	Protected against dust. Limited ingress permitted.	5	Protected against low-pressure jets of water from all directions. Limited ingress permitted.
6	Totally protected against dust.	6	Protected against strong jets of water from all directions. Limited ingress permitted.
		7	Protected against the effect of temporary immersion between 15 cm and 1 m.
		8	Protected against the effect of long-term submersion of 1 m or more.

APPENDIX B: RAIN HOODS

Weather-protected ULTRA-X40/42 loudspeakers include a rain hood for indoor/outdoor touring and sheltered outdoor installations. Meyer Sound offers two rain hood models: A fixed rigid rain hood for permanent installations and a collapsible hood for portable applications. Please specify your rain hood when placing the order.

RIGID RAIN HOOD

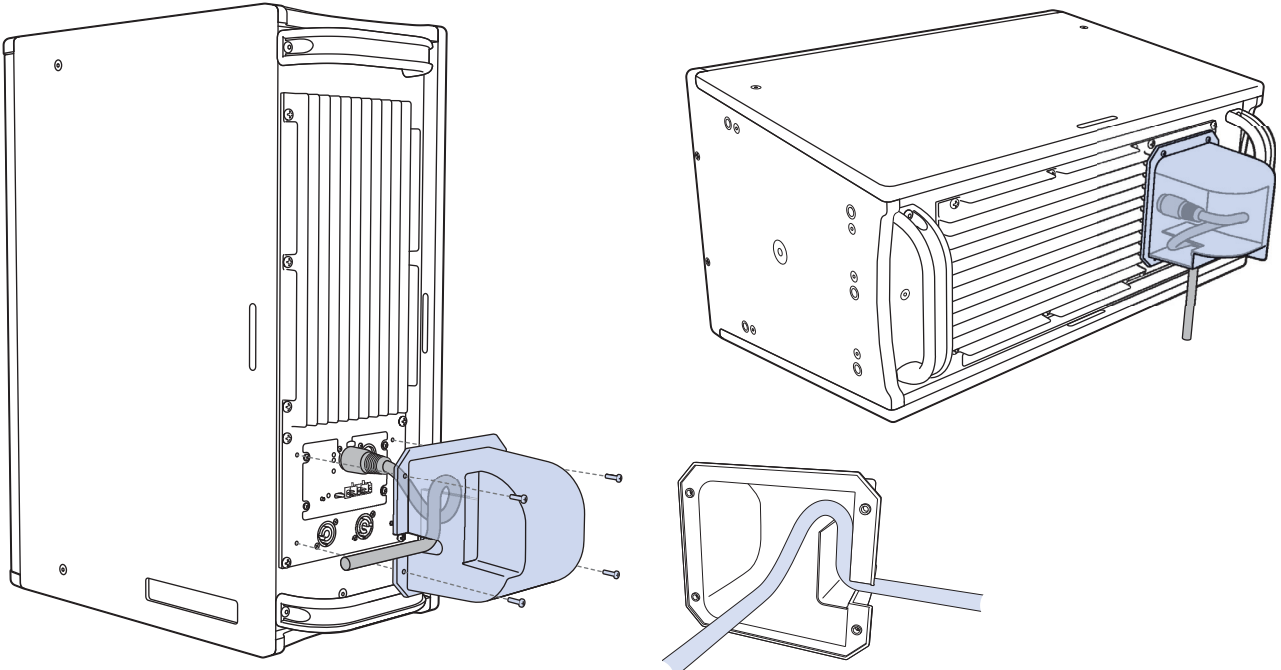The ULTRA-X40/42 rigid removable rain hood is easily attached and removed with the included four screws (Figure 75).

Figure 75: ULTRA-X40/42 with Rigid Rain Hood in Proper Vertical Orientation (left), Proper Horizontal Orientation (top right) and Correct Interior Cable Routing Illustration (bottom right)

To attach the ULTRA-X40/42 rigid rain hood:

1. Attach any required cables to the ULTRA-X40/42 loudspeaker.

2. Carefully route the cables, so that they wrap over and down the inner rainhood wall.

3. Attach the rain hood to the user panel, and secure it to the center of the panel with its four 6-32 screws.

4. Make sure to tighten the screws to create a good seal against the user panel. The recommended torque value for the screws is 10–12 in-lb (1.1–1.4 N-m).

⚠ **CAUTION:** There is only one proper vertical loudspeaker orientation and one proper horizontal loudspeaker orientation once the rainhood is installed. See Figure 75.

⚠ **CAUTION:** The weather-protected ULTRA-X40/42 must be mounted with a 0° tilt, or preferably with a slight down-tilt. This angle shields the driver from the elements and does not allow water to accumulate. Do not tilt the cabinet up, as the drivers and cabinet will accumulate water.

📖 **NOTE:** Weather-protected units using the rigid rainhood are rated IPX4 for water intrusion.

COLLAPSIBLE RAIN HOOD

The ULTRA-X40/42 collapsible rain hood is installed on the unit when shipped. Four screws secure its frame permanently into place (Figure 76).When using the rainhood, the loudspeaker has only one possible vertical and one possible horizontal position, as all cables must exit from the lower end of the loudspeaker.
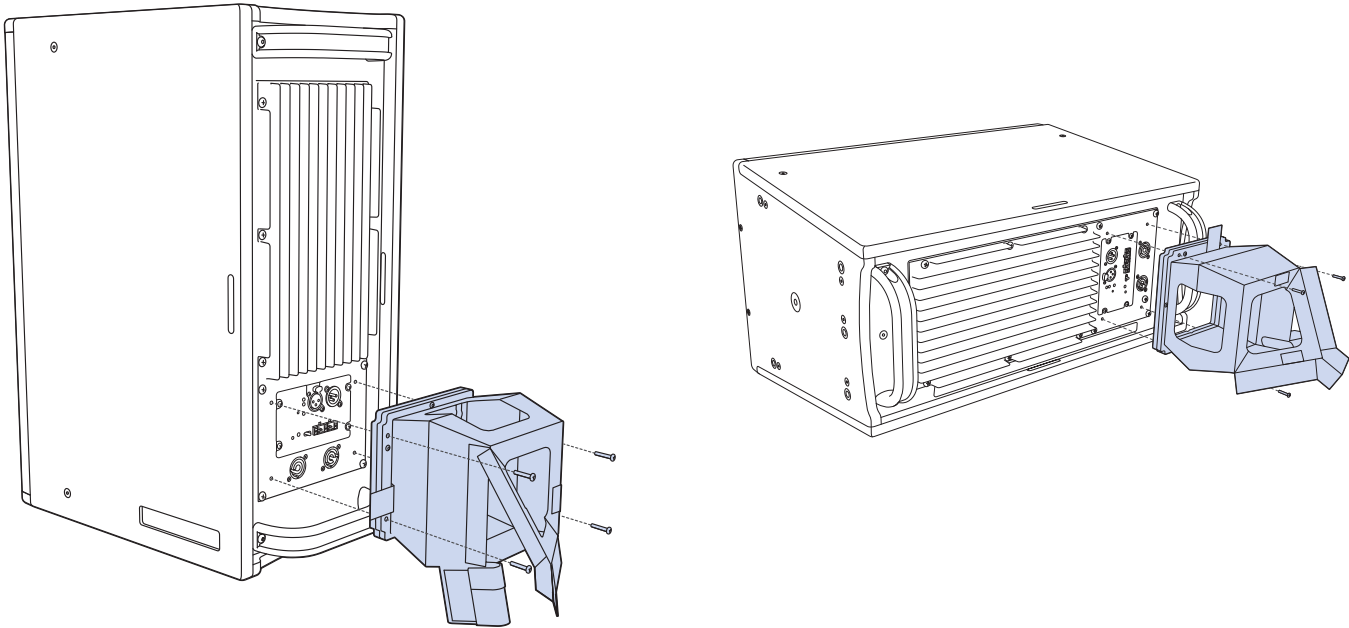

Figure 76: ULTRA-X40/42 with collapsible rain hood in vertical (left) and horizontal (right) orientations

To use the ULTRA-X40/42 collapsible rain hood:

1. Detach the Velcro straps and extend the rain hood.

2. Lift the front flap.

3. Attach any required cables to the ULTRA-X40/42. (The clear windows let you easily locate the connectors on the user panel.)

4. Secure the cable protector with the Velcro attachments.

5. Secure the front flap Velcro edges.

6. To stow the rain hood, reverse the steps.

7. Although not recommended, if for any reason the rainhood is removed, make sure to tighten the screws when reinstalling to create a good seal against the user panel. The recommended torque value for the screws is 10–12 in-lb (1.1–1.4 N-m).

⚠ **CAUTION:** The weather-protected ULTRA-X40/42 must be mounted with a 0° tilt, or preferably with a slight down-tilt. This angle shields the driver from the elements and does not allow water to accumulate. Do not tilt the cabinet up, as the drivers and cabinet will accumulate water.

⚠ **CAUTION:** The ULTRA-X40/42 must be oriented so that the cord exits at the bottom of the rainhood. Use care when installing the loudspeaker to ensure the rainhood is positioned to work properly when unfolded.
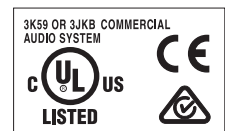
📖 **NOTE:** Weather-protected units using the collapsible rainhood are intended for portable uses and temporary outdoor deployment. The rainhood is designed to protect the connectors from direct exposure to rain.
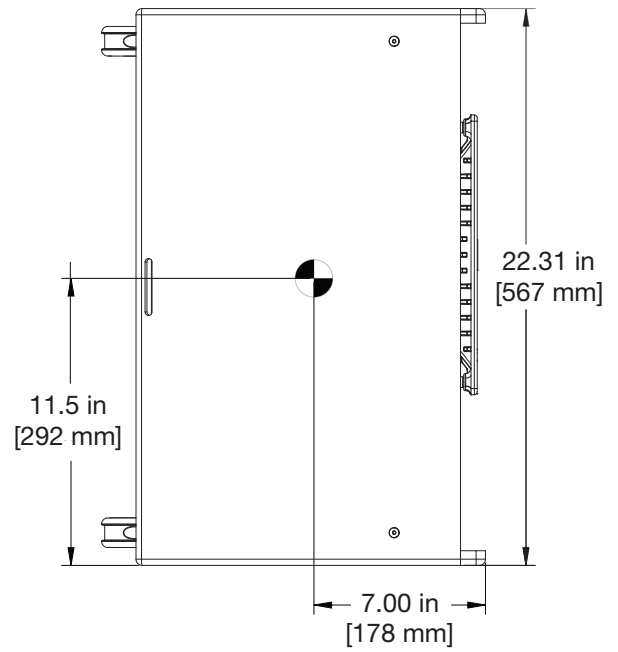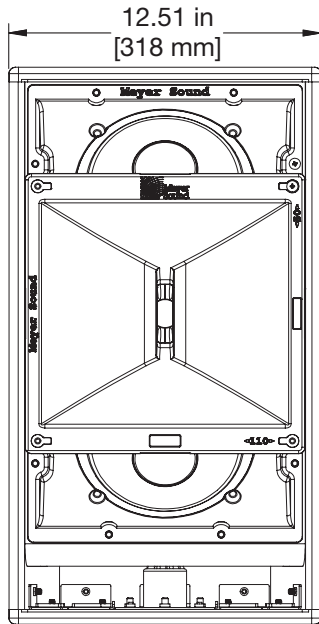
APPENDIX C: ULTRA-X40/42 SPECIFICATIONS

ULTRA-X40/42 ACOUSTICAL, ELECTRICAL, AND PHYSICAL SPECIFICATIONS

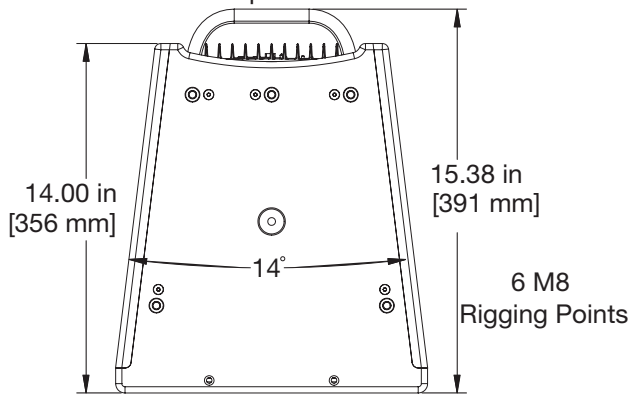| ACOUSTICAL		
	ULTRA-X40	**ULTRA-X42**
Operating Frequency Range	55 Hz – 19.5 kHz	55 Hz – 19.5 kHz
	Note: Recommended maximum operating frequency range. Response depends on loading conditions and room acoustics.	
Frequency Response	56 Hz – 19 kHz ±4 dB **Note:** Measured free field with 1/3 octave frequency resolution at 4 meters.	58 Hz – 18 kHz ±4 dB **Note:** Measured free field with 1/3 octave frequency resolution at 4 meters.
Phase Response	90 Hz to 19.5 kHz ±45°	90 Hz to 19.5 kHz ±45°
Linear Peak SPL	**132.5 dB with 18 dB crest factor (M-noise)**, 130 dB (Pink Noise), 131 dB (B-noise)	**134 dB with 18.5 dB crest factor (M-noise)**, 132 dB (Pink Noise), 134 dB (B-noise)
	Note: Linear Peak SPL is measured in free-field at 4 m referred to 1 m. Loudspeaker SPL compression measured with M-noise at the onset of limiting, 2-hour duration, and 50-degree C ambient temperature is < 2 dB. **M-noise** is a full bandwidth (10 Hz–22.5 kHz) test signal developed by Meyer Sound to better measure the loudspeaker's music performance. It has a constant instantaneous peak level in octave bands, a crest factor that increases with frequency, and a full bandwidth Peak to RMS ratio of 18 dB. **Pink noise** is a full bandwidth test signal with Peak to RMS ratio of 12.5 dB. **B-noise** is a Meyer Sound test signal used to ensure measurements reflect system behavior when reproducing the most common input spectrum, and to verify there is still headroom over pink noise.	
Coverage	Rotatable horn: 110° x 50° (at –6 dB)	Rotatable horn: 70° x 50° (at –6 dB)
TRANSDUCERS		
Low Frequency	Two 8-inch cone drivers; 4 Ω nominal impedance	
High Frequency	One 3-inch diaphragm compression driver connected to a rotatable horn; 8 Ω nominal impedance	
AUDIO INPUT		
Type	Differential, electronically balanced	
Maximum Common Mode Range	±15 V DC, clamped to earth for voltage transient protection	
Connectors	XLR 3-pin female input with male loop output; optional XLR 5-pin connector to accommodate both balanced audio and RMS signals.	
Input Impedance	10 kΩ differential between pins 2 and 3	
Wiring	Pin 1: Chassis/earth through 1 kΩ, 1000 pF, 15 V clamp network to provide virtual ground lift at audio frequencies Pin 2: Signal + Pin 3: Signal – (optional polarity reversal switch) Case: Earth ground and chassis **Note:** Pins 4 and 5 (RMS) only included with XLR 5-pin connector that accommodates both balanced audio and RMS signals.	
Nominal Input Sensitivity	0 dBV (1 V rms) continuous average is typically the onset of limiting for noise and music	
Input Level	Audio source must be capable of producing +20 dBV (10 V rms) into 600 Ω to produce maximum peak SPL over the operating bandwidth of the loudspeaker	

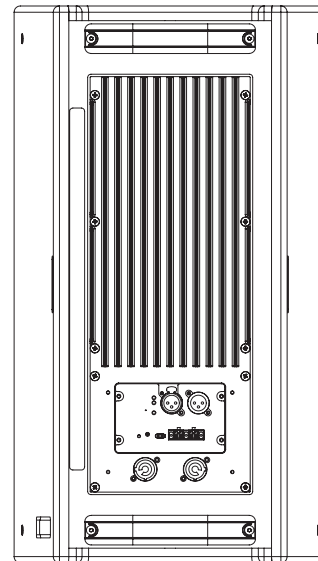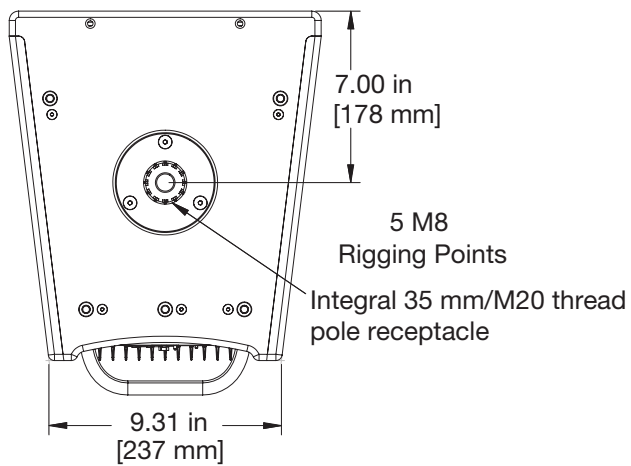| AMPLIFIER	
Type	Three-channel Class D
Total Output Power	1950 W peak **Note:** Peak power based on the maximum unclipped peak voltage the amplifier will produce into the nominal load impedance.
THD, IM TIM	<.02%
Cooling	Convection
AC POWER	
Connectors	powerCON 20 input with loop output
Automatic Voltage Selection	90–265 V AC, 50–60 Hz
Safety Agency Rated Operating Voltage	100–240 V AC, 50–60 Hz
Turn On/Turn Off Points	90 V AC turn-on, no turn-off; internal fuse protection above 265 V AC
Current Draw	
Idle Current	0.27 A rms (115 V AC); 0.25 A rms (230 V AC); 0.29 A rms (100 V AC)
Maximum Long-Term Continuous Current	1.9 A rms (115 V AC); 1.0 A rms (230 V AC); 2.2 A rms (100 V AC)
Burst Current	3.1 A rms (115 V AC); 1.5 A rms (230 V AC); 3.4 A rms (100 V AC) **Note:** AC power cabling must be of sufficient gauge so that under burst current rms conditions, cable transmission losses do not cause the loudspeaker's voltage to drop below the specified operating range.
Maximum Instantaneous Peak Current	6.9 A peak (115 V AC); 3.4 A peak (230 V AC); 7.9 A peak (100 V AC)
Inrush Current	<20 A peak
RMS NETWORK (OPTIONAL)	
	Two-conductor twisted-pair network that reports all operating parameters of amplifiers to system operator's host computer.
PHYSICAL	
Dimensions	W: 12.51 in (318 mm) x H: 22.31 in (567 mm) x D: 14 in (356 mm); D with handles: 15.38 in (391 mm)
Weight	52 lb (23.6 kg)
Enclosure	Premium multi-ply birch with slightly textured black finish
Protective Grille	Powder-coated, round perforated steel
Rigging	11 integrated M8 threaded points; 35 mm Pole Mount with M20 thread; optional accessories for various rigging options (see accessories section).
ENVIRONMENTAL	
Operating Temperature	0 °C to +45 °C
Non Operating Temperature	–40 °C to +75 °C
Humidity	To 95% at 45 °C (non-condensing)
Operating Altitude	To 5,000 m (16,404 ft)
Non Operating Altitude	To 12,000 m (39,000 ft)
Shock	30 g 11 msec half-sine on each of 6 sides
Vibration	10 Hz – 55 Hz (0.010 m peak-to-peak excursion)

3K59 OR 3JKB COMMERCIAL AUDIO SYSTEM

ULTRA-X40 LOUDSPEAKER DIMENSIONS

12.51 in
[318 mm]

22.31 in
[567 mm]

11.5 in
[292 mm]

7.00 in
[178 mm]

Top View

14.00 in
[356 mm]

15.38 in
[391 mm]

14°

6 M8
Rigging Points

Bottom View

7.00 in
[178 mm]

5 M8
Rigging Points

Integral 35 mm/M20 thread
pole receptacle

9.31 in
[237 mm]

ULTRA-X42 LOUDSPEAKER DIMENSIONS

12.51 in
[318 mm]

22.31 in
[567 mm]

11.5 in
[292 mm]

7.00 in
[178 mm]

Top View

14.00 in
[356 mm]

15.38 in
[391 mm]

14°

6 M8
Rigging Points

Bottom View

7.00 in
[178 mm]

5 M8
Rigging Points

Integral 35 mm/M20 thread
pole receptacle

9.31 in
[237 mm]
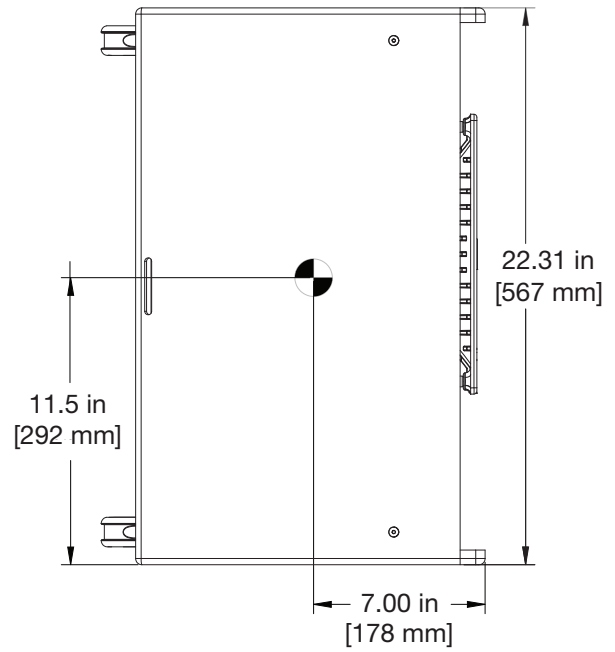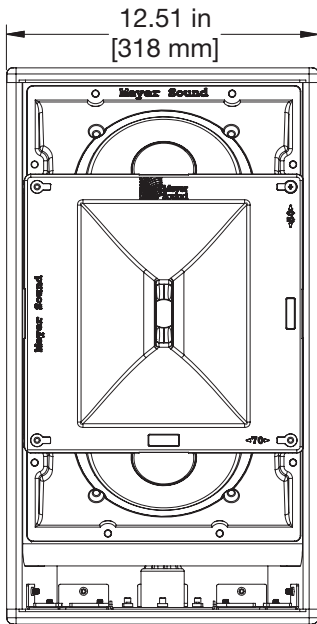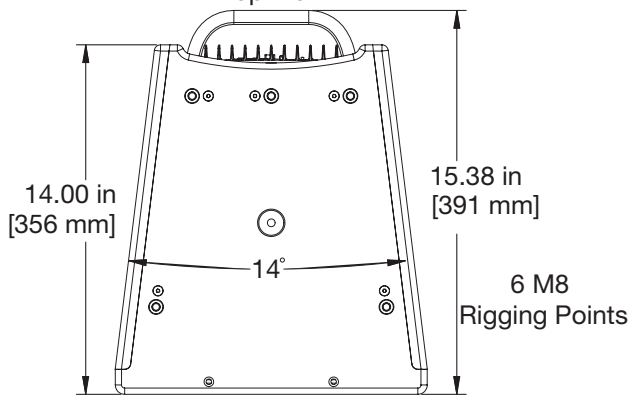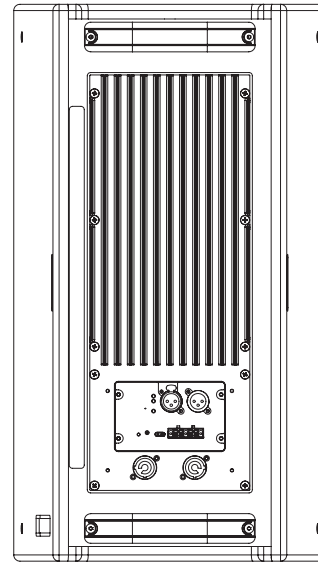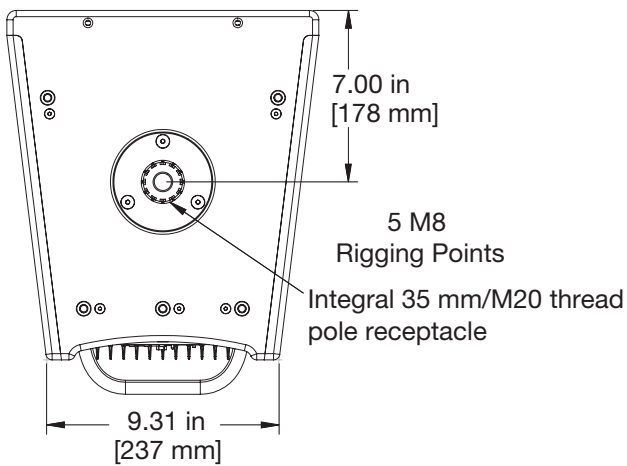
ULTRA-X40/42 WITH RAIN HOOD LOUDSPEAKER DIMENSIONS

22.31 in
[567 mm]

3.54 in
[90 mm]

17.48 in
[444 mm]

14.66 in
[372 mm]

4.84 in
[123 mm]

2.81 in
[71 mm]

4.31 in
[110 mm]

12.51 in
[318 mm]
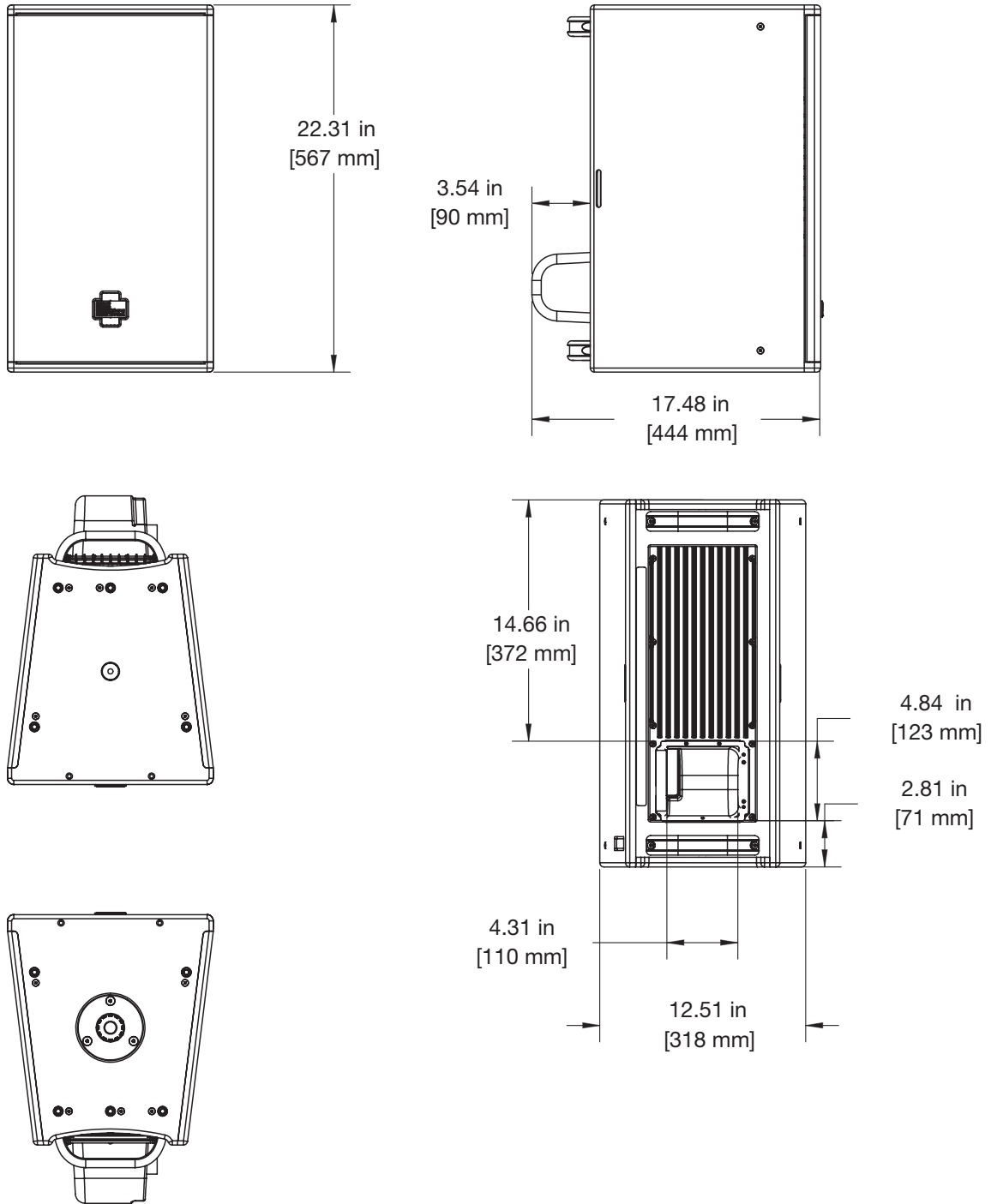
MTB-X40 DIMENSIONS

Self-weight: 12 lb [5.5 kg]
Load rating: 5:1
156 lb [70.9 kg]
(3 ULTRA-X40/X42)

22.43 in
[570 mm]

22.91 in
[582 mm]

16x⌀ 0.39 in
[10 mm]

8.57 in
[218 mm]

7.87 in
[200 mm]

5.02 in
[128 mm]

5.56 in
[141 mm]

10.00 in
[254 mm]

1.00 in
[25 mm]

3x⌀0.53 in
[13 mm]

6x⌀0.27 in
[7 mm]

1.83 in
[47 mm]

5.00 in
[127 mm]

9.50 in
[241 mm]

9.50 in
[241 mm]
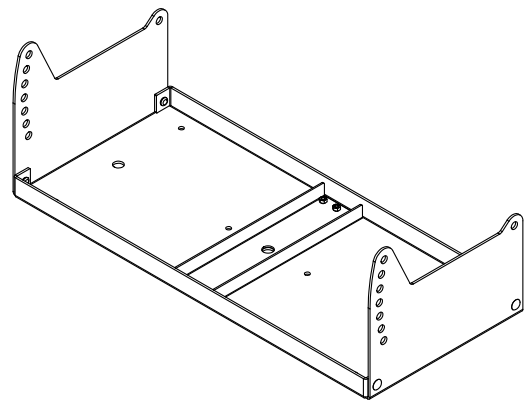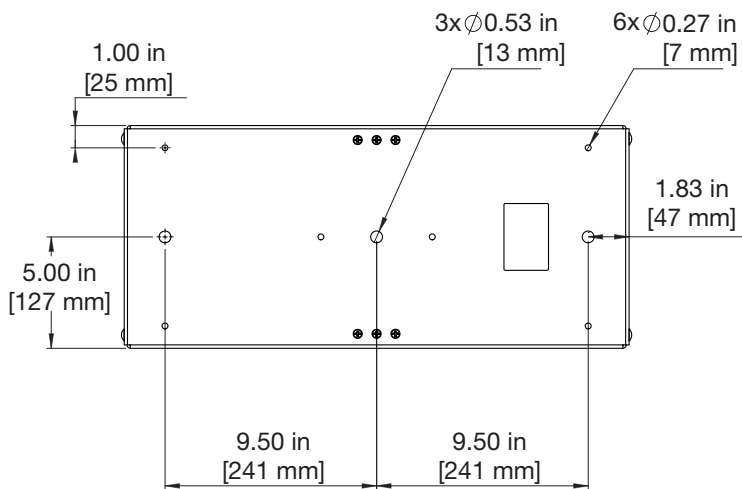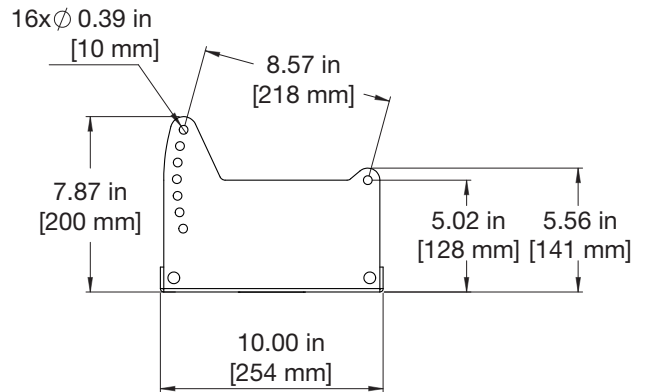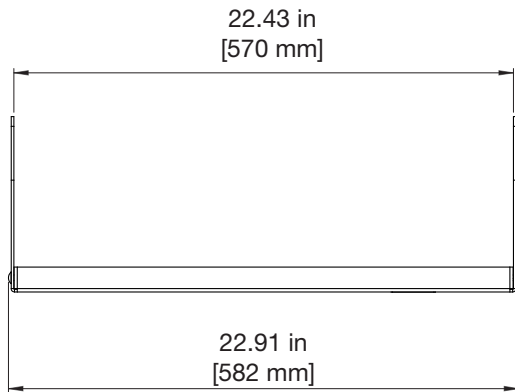
MUB-X40 DIMENSIONS

Self-weight: 10 lb [4.5 kg]
Load rating: 5:1
52 lb [23.6 kg]
(1 ULTRA-X40/X42)
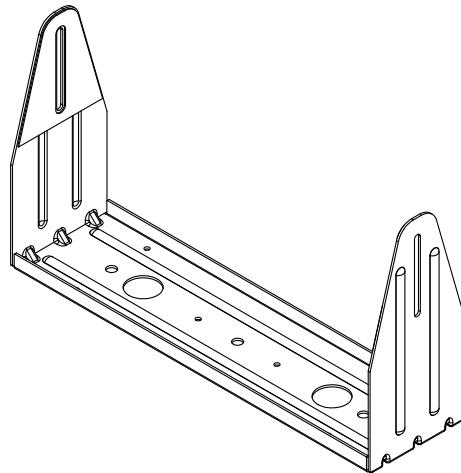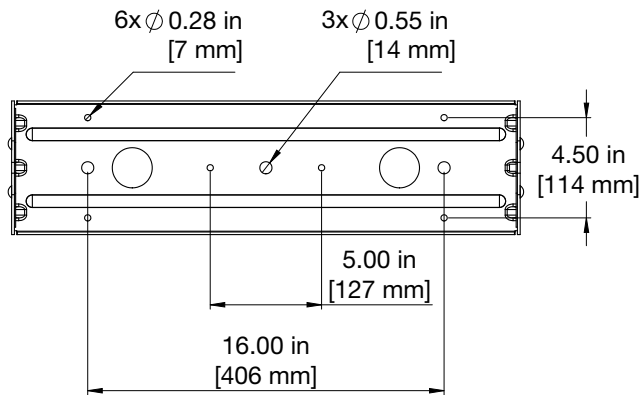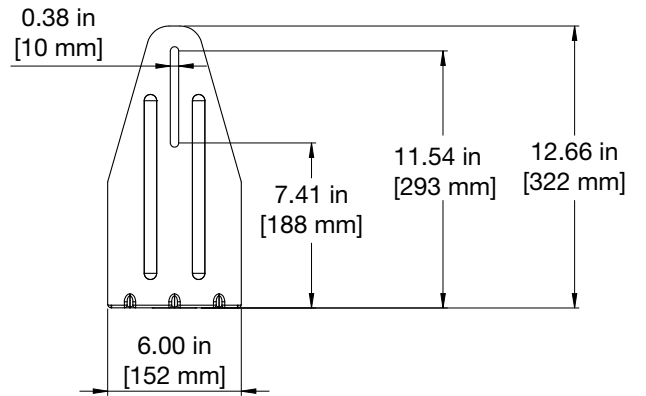
23.14 in
[588 mm]

0.38 in
[10 mm]

7.41 in
[188 mm]

11.54 in
[293 mm]

12.66 in
[322 mm]

6.00 in
[152 mm]

6x ⌀ 0.28 in
[7 mm]

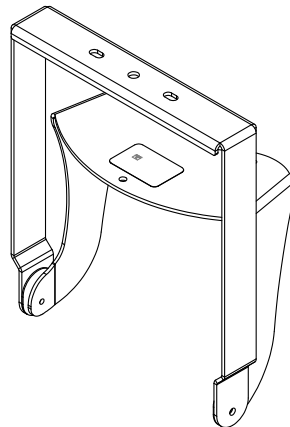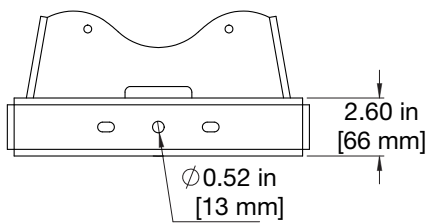3x ⌀ 0.55 in
[14 mm]

4.50 in
[114 mm]

5.00 in
[127 mm]

16.00 in
[406 mm]

MYA-X40 DIMENSIONS

Self-weight: 12 lb [5.5 kg]
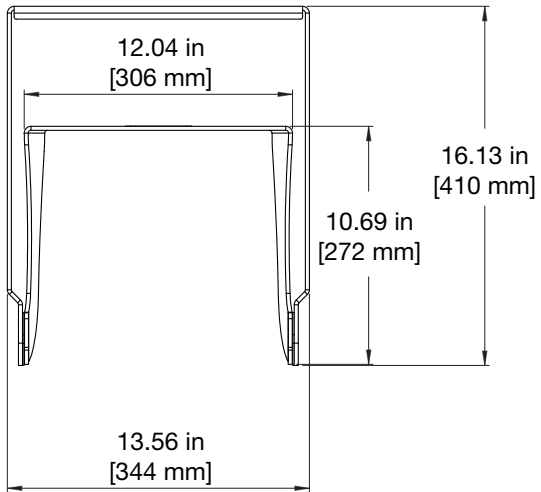Load rating: 5:1 52 lb [23.6 kg]
(1 ULTRA-X40/X42)

12.04 in
[306 mm]

16.13 in
[410 mm]

10.69 in
[272 mm]

13.56 in
[344 mm]

6.51 in
[165 mm]
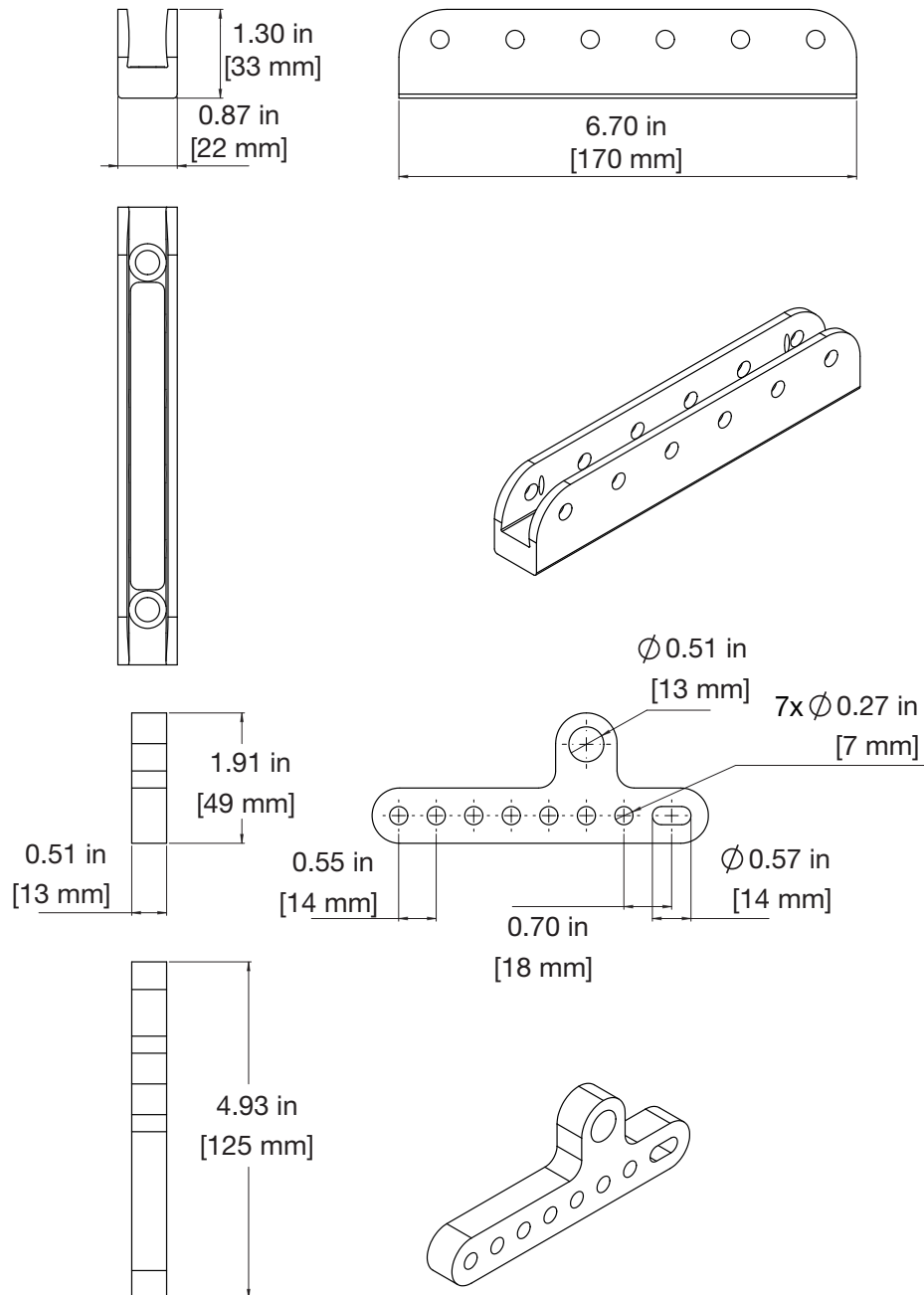
2.60 in
[66 mm]

⌀0.52 in
[13 mm]
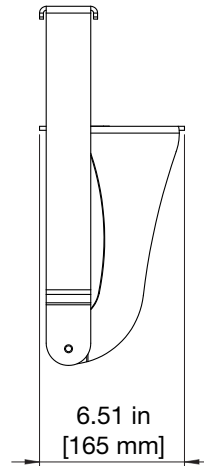
MTC-X40 DIMENSIONS

Self-weight: 0.7 lb [0.3 kg]
Load rating: 5:1
Top connection: 260 lb [118.2 kg] (5 ULTRA-X40/X42)
Bottom connection: 104 lb [47.3 kg] (2 ULTRA-X40/X42)

1.30 in
[33 mm]

0.87 in
[22 mm]

6.70 in
[170 mm]

$\varnothing$ 0.51 in
[13 mm]

7x $\varnothing$ 0.27 in
[7 mm]

1.91 in
[49 mm]

0.51 in
[13 mm]

0.55 in
[14 mm]

$\varnothing$ 0.57 in
[14 mm]

0.70 in
[18 mm]

4.93 in
[125 mm]

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