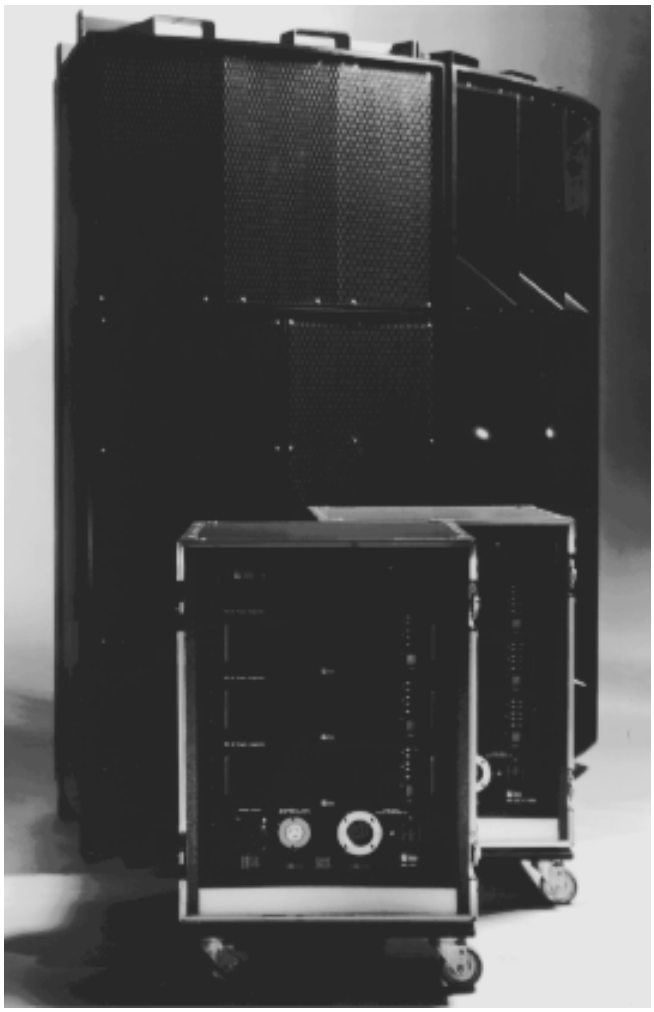

The Meyer Sound MSL-10A is an extremely high-power, high-performance loudspeaker designed for large-scale music reinforcement and public address applications. It is a biamplified system consisting of four proprietary 12" cone drivers in a unique horn-loaded vented enclosure, and three 2" high frequency drivers (4" diaphragm diameter) with vertical 40-degree horns. The MSL-10A is a full-range loudspeaker constructed as a 30-degree arrayable section, and is designed to be operated with the Meyer Sound M-10A Control Electronics Unit (one M-10A per channel). The M-10A comprises electronic crossover, Meyer Sound's exclusive SpeakerSense™ driver protection circuitry, and amplitude and phase response alignment circuitry optimized for the loudspeaker.

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Amplifier Requirements

The MSL-10A requires three channels of amplification with each channel meeting the following specifications:

1. Inputs. Must utilize XLR-type connectors with balanced input circuitry wired such that a positive voltage on connector pin 3 results in a positive voltage at the amplifier output.

2. Voltage Gain. Must be fixed at 16 dB (6.3 volts out for 1 volt in) when measured from input to output.

3. Mains AC Power. AC power inlet must be a three-circuit grounded plug with earth (mains AC) ground permanently connected to chassis. The amplifier must meet the power output criteria over a line voltage range of 180V to 260V AC, 50/60 Hz (may be split into two switch-selectable ranges).

4. Power Output. Each channel of amplification must meet two power criteria:

- The amplifier must be capable of driving an 8Ω load at 367 W continuously for 60 minutes without shut-down or distortion exceeding 0.1%. Following the above preconditioning, it must deliver 1100 W for 5 minutes without shut-down or distortion exceeding 0.1%.
- The amplifier must be capable of driving a 4Ω load at 1800 W in 0.5 sec. bursts without shut-down, peak clamping or distortion exceeding 0.1%.

It is recommended that only one high- or low-frequency section of the MSL-10A be driven by a single amplifier channel, as each section represents a 4 ohm load.

For further information on power amplifiers, please refer to **MSL-10A Power Amplifier Criteria**, a Meyer Sound Technical Note available from your dealer.

Connections

There are two connectors on the rear side of the MSL-10A cabinet, one for the loudspeaker drive cable and the other for environmental power.

1. Loudspeaker cable connections – The MSL-10A is a biamplified system and **must** be used with the **M-10A Control Electronics Unit**. The M-10A functions as an active crossover, dividing the input signal into high and low frequency components. The connection terminals of the high and low frequency drivers appear on a single 7-pin Pyle connector located on the rear of the MSL-10A cabinet. The pin assignments for this connector are:

Pin 1 – Low frequency drivers 1&2, hot
Pin 2 – Low frequency drivers 1&2, common
Pin 3 – Low frequency drivers 3&4, hot
Pin 4 – Low frequency drivers 3&4, common
Pin 5 – High frequency drivers 5,6 &7, hot
Pin 6 – High frequency drivers 5,6 &7, common
Pin 7 – Not connected

The minimum wire size for connections between the MSL-10A and the power amplifiers is 10 gauge (larger for runs over 100 feet).

Note: If you are using a standard Meyer Sound MSL-10A amplifier/drive rack, simply connect the female end of the speaker cable to the MSL-10A, the male end of the cable to the connector on the bottom panel of the drive rack. In making connections between the MSL-10A and its amplifiers, be sure to connect the 12-inch drivers to the **Lo** amplifiers, and the horn drivers to the **Hi** amplifier. The adapter banana plugs are color-coded as follows:

Red – Low frequency drivers
Black – High frequency drivers

For connections between the M-10A and the power amplifiers, refer to the **M-10A Operating Instructions**.

2. Environmental power cable connections – The MSL-10A is equipped with a thermostatically-controlled environmental heating and cooling system which ventilates the cabinet and stabilizes its interior temperature. In extreme temperature/weather conditions, or in permanent installations, this environmental system is enabled by connecting its environmental power cable from the MSL-10A amplifier/drive rack to the rear of the cabinet by way of a 3-pin Hubble twist-lock connector.

Located next to the environmental power cable connector on the rear panel of the MSL-10A are the environmental power indicator and circuit breaker.

Verifying System Polarity

All Meyer Sound loudspeakers are thoroughly tested in all stages of manufacture and correct polarity of individual cabinets is assured. However, accidental polarity reversal is possible when there are multiple amplifier connections, and a single cabinet which is out of polarity with the rest of its array will cause severe cancellation. This will result in a noticeable decrease in SPL and possible component damage.

The "phase-popper" type of speaker polarity checkers cannot reliably be used to test for correct polarity of the low and high drivers of the MSL-10A. However, because the MSL-10A is phase-corrected through crossover, SIM® System II or many of the portable spectrum analyzers can be used, with a pink noise source, to test for driver polarity as follows:

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1. Single cabinets. First, verify polarity of the bottom two woofers by connecting a 9 volt battery at the end of the loudspeaker cable.

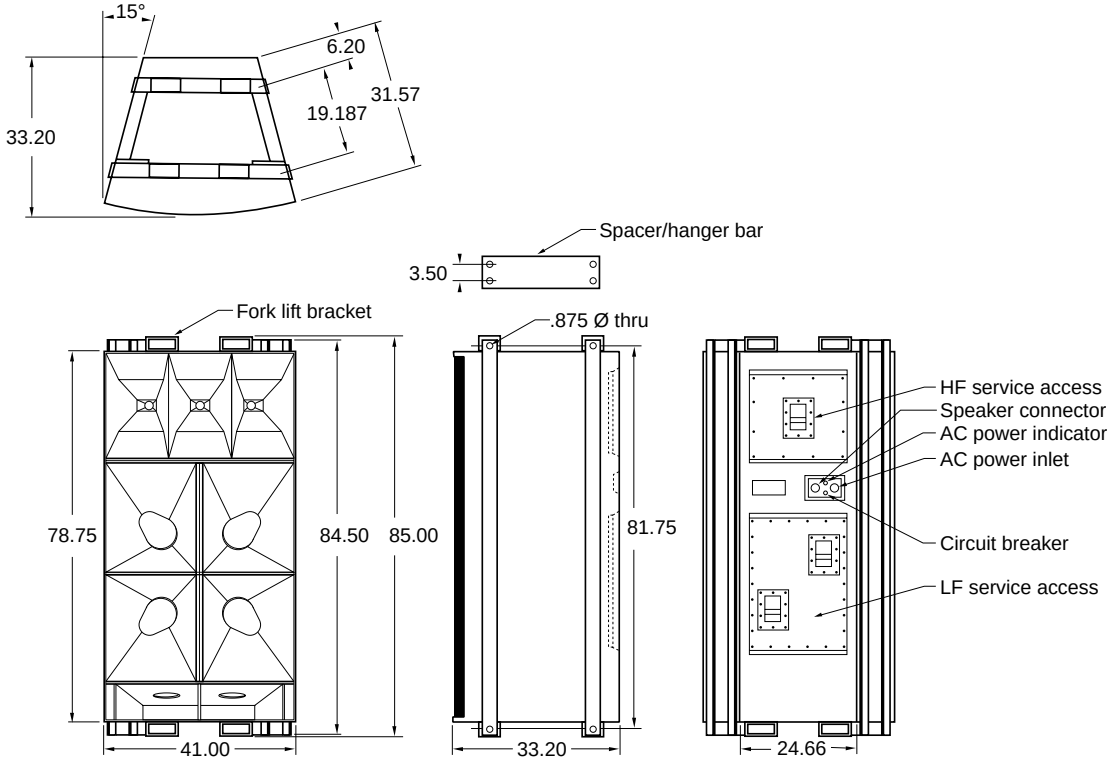
Pyle connector	Battery
Pin 1	+ terminal
Pin 2	– terminal

- The woofer cones should move outward.
- Repeat this check with the second pair of woofers by connecting pin 3 to battery +, and pin 4 to battery –. Again the woofer cones should move outward.
- Reconnect the loudspeaker cable to the MSL-10A amplifier/drive rack.
- Input the pink noise source to the M-10A and advance its level control to a convenient measuring level.
- Standing in front of the loudspeaker, position the analyzer microphone directly between the HF horns section and the 12-inch drivers, at a right angle to the cabinet face, and about 1 meter in front of the MSL-10A.
- If polarity of the high frequency drivers is reversed, a trough will appear in the response curve centered near 800 Hz. If in doubt, reverse the polarity of the **Hi** amplifier output while you watch the analyzer display.

2. Multiple cabinet arrays. Each cabinet should first be tested as above.

- Connect one loudspeaker and advance the pink noise to a convienent measuring level. Position the measuring microphone on the axis between the loudspeaker and the cabinet adjacent to it, and about 2 meters distant. Note the frequency response and overall level.
- Leaving the first loudspeaker connected, connect the adjacent one and observe the analyzer display. The entire curve should jump up in level, indicating correct addition between the loudspeakers. A polarity reversal between the loudspeakers will show up as severe broadband cancellation.
- Similarly, add in the rest of the cabinets of the array one at a time, looking for correct addition as each loudspeaker is connected. (It will be necessary to reposition the microphone.)

Physical Dimensions



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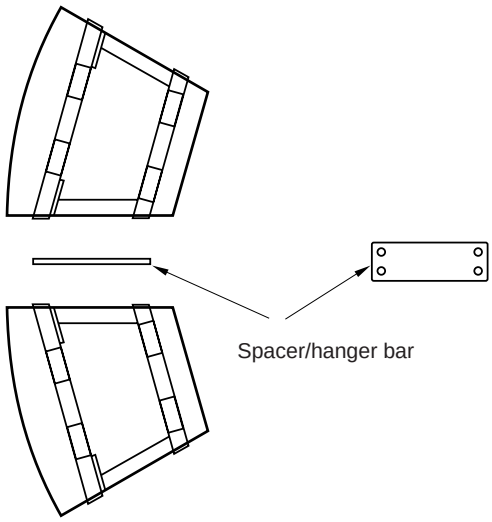
Arraying and Rigging

The MSL-10A loudspeaker is designed to function as a modular building block capable of being arrayed in multiples to satisfy a wide range of acoustical power and coverage requirements.

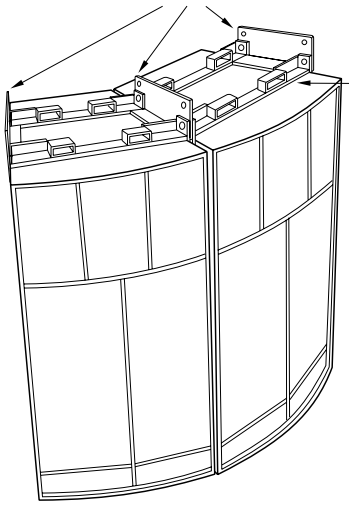
Configured as a tightly controlled 30-degree section, the MSL-10A cabinet features a trapezoidal construction which forms curved arrays. MSL-10A's in an array combine acoustically in a seamless fashion to form a radiating arc, producing uniform, coherent wavefronts over the angle subtended by the array.

The propagation characteristic of an MSL-10A array thereby closely approximates that of a theoretically perfect pulsating gas sphere — but rather than being omnidirectional, the radiation is confined to an area that is controlled by the array configuration. This yields exceptional intelligibility in reverberant environments, with substantially the same sonic character in both the near and far field – a critical advantage in large-scale sound reinforcement.

To expedite arraying and installation, the MSL-10A is fitted with an integral rigging system. Comprising steel braces on the cabinet sides and convenient fork lift feet on top and bottom, the rigging system eases handling and provides secure points from which to suspend the cabinet. In conjunction with an accessory spacer/hanger bar, it also facilitates coupling adjacent cabinets to form rigid arrays.



Rig from spacer/hanger bar

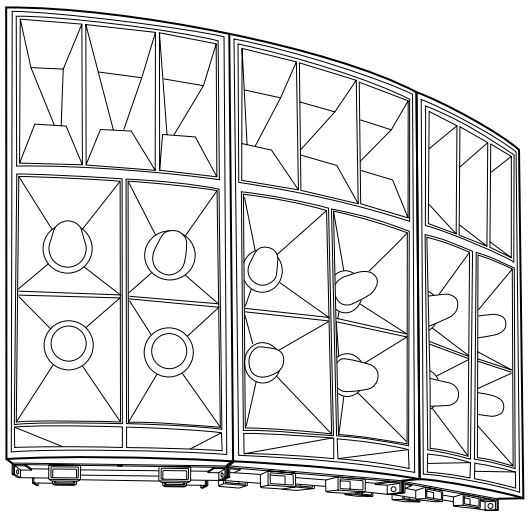


Wide Horizontal Arrays

The minimum MSL-10A configuration is two cabinets (as shown above).

Coupled side-by-side, the minimum configuration of two cabinets delivers 60 degrees horizontal coverage. Spacer/hanger bars and case-hardened steel bolts join the cabinets together and provide rigging points for hoisting.

To increase the horizontal coverage of the array, one or more cabinets may be added as shown in the illustration to the right. Each cabinet added to the array extends its horizontal coverage by 30 degrees while maintaining a consistent 40 degrees of vertical coverage.



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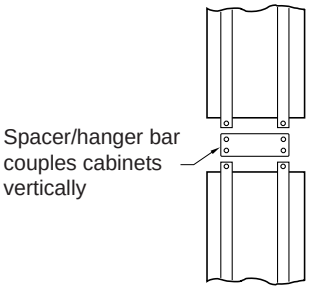
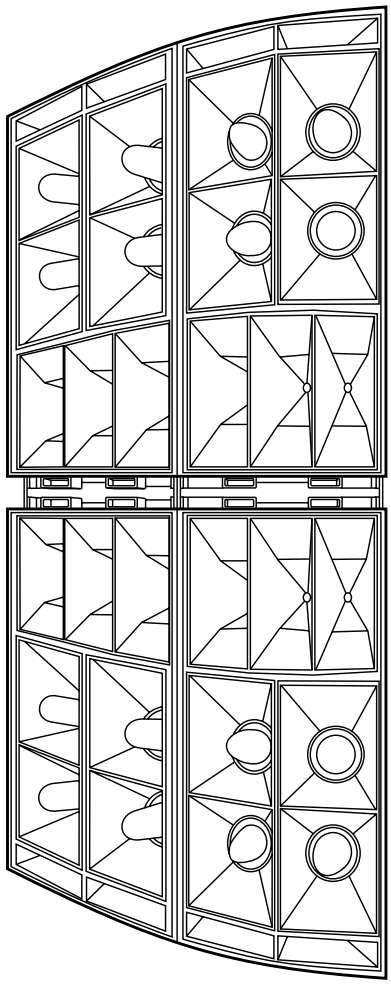
Long-Throw Arrays

To increase the effective throw of the system, MSL-10A cabinets may be arrayed one atop another with high horns together, as shown in the illustration at the right. Spacer/hanger bars are used to couple the cabinets both horizontally and vertically, as illustrated below. A second set of spacer/hanger bars at the top provides convenient points for hoisting and hanging the array.

In this configuration, coupling between the adjacent horns narrows the vertical dispersion of the array to ±10 degrees, moving the focal point (or virtual source) farther behind the array. Since inverse-square propagation losses depend upon the distance from the focal point (rather than from the array surface), this configuration maintains high sound pressures over very long distances.

The effect is analogous to the difference between a floodlight and a searchlight. The floodlight distributes energy very widely, as though from a proximate point source, and its intensity decreases relatively quickly with increased distance. The searchlight, on the other hand, projects a narrow, focused beam which is the equivalent of colimated light from a distant, very powerful point source. Its intensity therefore decreases much more slowly with increased distance.

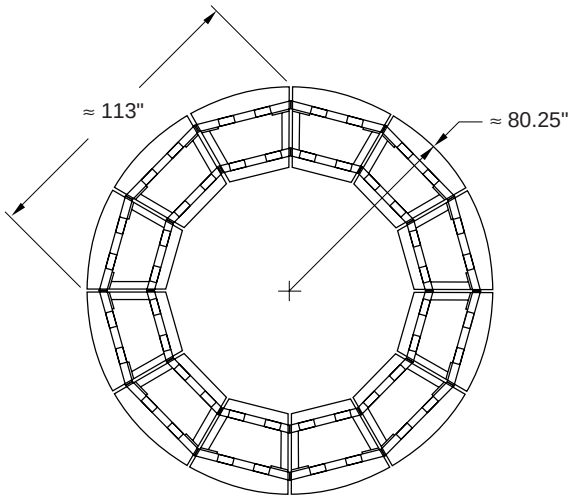




Ring Configuration

As shown at right, twelve MSL-10A cabinets arrayed horizontally form a complete ring providing 360-degree horizontal coverage.

This system produces prodigious sound pressures in a reasonably compact package (80.25" radius), and is effective for large scale concerts in-the-round or sporting events in very large stadiums. Where required, additional cabinets may be added vertically, as shown above, to increase the throw for any portion(s) of the total arc.



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Specifications

Acoustical MSL-10A / M-10A System[1]

Frequency Response[2]	40 Hz - 16 kHz ±4 dB
Maximum SPL at 100 feet	
Continuous	110 dB
Peak	120 dB
HF Coverage	
Horizontal	60 degrees
Vertical	40 degrees

MSL-10A Loudspeaker (one 30° section)

Driver Complement	
Low Frequency Drivers	(4) MS-12 12-inch cone drivers
High Frequency Drivers	(3) MS-2001N-10 2-inch compression drivers
HF DC Protection	50 µf polypropylene capacitor
Enclosure	Vented, horn-loaded multi-ply hardwood
Finish	Weatherproof black paint
Protective Grill	Three piece expanded metal screen, damped
Rigging	Eight points, ¾" rigging holes in steel cradle
Dimensions	41" W x 85" H x 33 ¼" D
Weight	720 lbs. (327 kg)
Heater and Fan Power Supply	200-240 VAC, 3A
Connectors	Pyle with weather cap, heavy-duty AC in, weather protected

Notes:
1. Acoustical specifications are given for a configuration of **two** 30-degree sections.
2. Measured 100 feet on axis, half-space conditions, pink noise input, in third-octave bands.

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