The Meyer Sound UPA-1C is a compact, high-power arrayable loudspeaker designed to perform in a wide variety of sound reinforcement applications. It is a bi-amplified system consisting of a proprietary 12-inch low-frequency cone driver in a vented enclosure with an 80-degree horizontal high-frequency horn and driver.

The UPA-1C is designed to be operated as a system with the Meyer Sound M-1A Control Electronics Unit (one M-1A per channel). The M-1A comprises electronic crossover, Meyer Sound exclusive SpeakerSense™ driver protection circuitry, and amplitude and phase response alignment circuitry optimized for the loudspeaker.

Meyer Sound

Meyer Sound Laboratories, Inc.
2832 San Pablo Avenue
Berkeley, CA 94702

UPA-1C Loudspeaker

Operating Instructions

Amplifier Requirements

The UPA-1C requires a professional quality two-channel power amplifier rated at 200-300 watts per channel continuous into 8 ohms. (If two UPA-1Cs are to be operated in parallel from the amplifier, it should be capable of driving 4 ohms.) Use of amplifiers of lower power will not allow the full power and headroom of the UPA-1C system to be realized (though this may be acceptable in applications where high pressure levels are not required). Conversely, use of amplifiers rated at significantly more than 300 watts per channel into 8 ohms may endanger the loudspeaker, and **is not recommended.**

Connections

The UPA-1C is a biamplified system and **must** be used with the **M-1A Control Electronics Unit**. The M-1A functions as an active crossover, dividing the input signal into high and low frequency components.

The connection terminals of the low and high frequency drivers appear on a single EP-type 4-pin connector located on the rear of the UPA-1C cabinet. The pin assignments for this connector are:

Pin 1 – 12-inch driver, hot
Pin 2 – 12-inch driver, common
Pin 3 – horn driver, common
Pin 4 – horn driver, hot

(When the cabinet is fitted with a EP-5 connector, Pin 5 is unconnected.)

The minimum wire size for connections between the UPA-1C and the power amplifier should be 14 gauge.

Note: If you are using standard Meyer Sound **l**oudspeaker cables and adapters, simply connect the female end of the loudspeaker cable to the UPA-1C, the male end of the cable to the Meyer Sound pigtail adapter, and the banana connectors of the adapter to your amplifier outputs. In making connections between the UPA-1C and the amplifier, be sure to connect the 12-inch driver to the **Lo** channel, and the horn driver to the **Hi** channel.

The adapter banana plugs are color-coded as follows:

Red – Low frequency driver
Black – High frequency driver

For connections between the M-1A and the power amplifier, refer to the **M-1A Operating Instructions**

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. A single cabinet which is 180 degrees out of polarity with the rest of the system will cause severe cancellation, resulting in a noticeable decrease in SPL and possible component damage.

The preferred method for testing Meyer Sound loudspeakers is to use SIM® System II. Alternatively, many of the portable spectrum analyzers can be used, with a pink noise source, to test for driver polarity as follows:

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

Connector	**Battery**
Pin 1	+terminal
Pin 2	- terminal

- The woofer cone should move outward toward the listener. Connect the speaker cable to the amplifier.
- Input the pink noise source to the M-1A and advance the M-1A. Level control to a convenient measuring level.
- Standing in front of the loudspeaker, position the analyzer microphone directly between the horn and the 12-inch driver, at right angles to the cabinet face, and about 20 inches in front of the UPA-1C.
- If the polarity of the horn driver is reversed, a trough will appear in the response curve, centered near 1600Hz. 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 in the array and advance the pink noise to a convenient measuring level. Position the measuring microphone on the axis between the first loudspeaker and the cabinet adjacent to it, and about six feet 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, connect the rest of the cabinets in the array one by one, looking for correct addition as each loudspeaker is connected. (It will be necessary to reposition the microphone.)

Note: A polarity reversal within the system can result in severe damage to the components. It is strongly recommended that polarity testing be done at low levels and with the appropriate equipment.

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Rigging

The UPA-1C loudspeaker has four steel rigging brackets internally mounted as an integral part of the cabinet design and the cabinet is supplied with either aircraft pan fittings (ring and stud), 3/8" -16 or M10 nut plates, according to user preference. A flat plate is supplied when no rigging hardware is specified. All plates are held in place by six Phillips-head machine screws and can be interchanged at any time. The handles on the UPA-1C cabinet are provided solely for moving and carrying the loudspeaker and are **not** to be used for rigging purposes.

The rigging hardware is so designed that a single point can support the normal load for the cabinet. In the case of the UPA-1C the recommended maximum load is 420 lbs (190 kg) (for example, the weight of the cabinet itself plus an MSL-3A and a UPA-1C hung beneath). Any of the individual rigging points is capable of supporting this load with an adequate safety margin. However, Meyer Sound strongly recommends that safety lines be run to the other points. If the structural integrity of any cabinet has been compromised by damage or negligence, then the safety of the rigging cannot be assured. All rigging should be done by competent professionals.

Placement and Arraying

The high frequency horn of the UPA-1C adds very well in the horizontal axis, and the apparent sources of both high and low frequencies in the UPA-1C are co-planar in terms of propagation. For these reasons, multiple loudspeakers may be built into an array which behaves acoustically as a section of a radiating spherical surface. Such arrays offer precisely controlled coverage and propagate coherent wavefronts, acting as a close approximation to a point source. These are the basic rules for forming arrays with the UPA-1C.

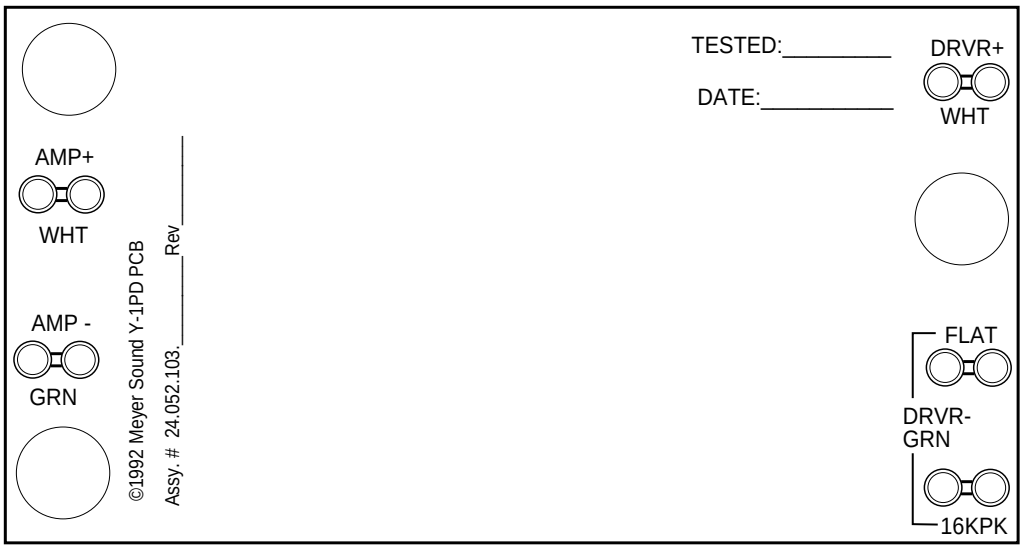
- Keep the rear corners of adjacent loudspeakers together or close to one another.
- For wider horizontal coverage, spread the angle between adjacent loudspeakers (to a maximum 45 degrees), by moving the front corners apart. For even frequency response with two UPA-1C, the minimum separation angle between cabinets should be 15 degrees.

High Frequency Network

The UPA-1C loudspeaker contains, mounted in the enclosure, a DC protection and response correction network for the high-frequency horn driver. The network is mounted directly behind the MS-12 low-frequency cone driver on the inside rear face of the cabinet, and is wired in series with the horn driver.

The circuit board is fitted with five terminals, two of which (labeled AMP- and AMP+) are wired to the Cannon EP-4 connector pins 3 and 4. The other terminals (labeled FLAT and 16KPK), provide two options for tailoring the system's response. With the high driver common (green) wire connected to the FLAT terminal, the UPA-1C high-frequency response is nominally flat to 20 kHz. When the common wire is connected to the 16KPK terminal, the UPA-1C exhibits a peaked response in the 16 kHz region. This response may be useful for overcoming propagation losses when far-field response is a dominant concern.

The UPA -1C is shipped with the high driver common connected for flat response. Should you desire more high-frequency energy, simply remove the six bolts holding the MS-12 in place, pull the MS-12 up and out of the cabinet, and move the green wire from the FLAT terminal to the 16KPK terminal. Be careful not to disturb the other wires to the network board or EP connector. When replacing the MS-12, be certain to tighten the six bolts evenly.



UPA-1C High Frequency Network Circuit Board

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Specifications

Acoustical–UPA-1C/M-1A System

Frequency Response[1]	80 Hz to 18 kHz ±4dB -6 dB at 60 Hz and 20 kHz

Maximum SPL[2] with amplifier rated at:	250W/8 ohms/ch	60W/8 ohms/ch
Continuous	125dB	120dB
Peak	132dB	125dB

HF Coverage	
Horizontal	80 degrees
Vertical	60 degrees

UPA-1C Loudspeaker

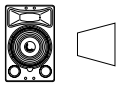
Driven Complement	
Low Frequency Driver	MS-12
High Frequency Driver	MS-1401B
High Frequency Horn	Modified radial with foam lens
HF Network	Y-1PD
Function	DC blocking and damped band-elimination filter
Enclosure	0.8 cu. ft. vented, multi-ply Finnish Birch plywood
Finish	Black textured, weather protected (optional)
Physical Dimensions	14 1/2"W x 22 3/8"H x 14 1/2"D
Weight	67 lbs. (30 kg)
Protective Grill	Perforated steel screen, charcoal-grey foam covering
Connector	EP-4 (male), EP-5 (male, Europe only)
Rigging (optional)	Aircraft pan fittings, or 3/8"-16 or M10 x 1.5 nut plate

Note 1:

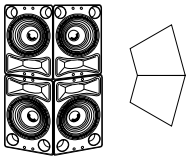
Measured 1 meter from center of cabinet face, half-space conditions, pink noise input, network set to FLT, smoothed to one-third octave. Low frequency response dependent on load conditions.

Note 2:

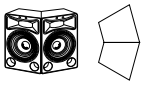
Loudspeaker driven with pink noise.



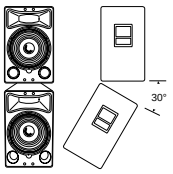
Coverage Angle[1]
Vertical 60°
Horizontal 80°
Maximum SPL @ 1meter
Continuous 125 dB
Peak 135 dB
Total Amplifier Power 450 watts



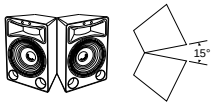
Long Throw High Power Array
Coverage Angle[1,3]
Vertical 30°
Horizontal 130°
Maximum SPL @ 1meter
Continuous 135 dB
Peak 145 dB
Total Amplifier Power 1.8kw



Narrow Horizontal Coverage Array
Coverage Angle[1,3]
Vertical 60°
Horizontal 130°
Maximum SPL @ 1meter
Continuous 129 dB
Peak 139 dB
Total Amplifier Power 900 watts



Wide Vertical Coverage Array[2]
Coverage Angle[1,3]
Vertical 100°
Horizontal 80°
Maximum SPL @ 1meter
Continuous 125 dB
Peak 135 dB
Total Amplifier Power 900 watts



Wide Horizontal Coverage Array
Coverage Angle[1,3]
Vertical 60°
Horizontal 140°
Maximum SPL @ 1meter
Continuous 129 dB
Peak 139 dB
Total Amplifier Power 900 watts

[1] Coverage angle is the -6dB average. All measurements made at 24 inches and confirmed at 6 feet (on-axis except where noted) using pink noise source and measured in 1/3rd octave bands.

[2] This configuration produces smooth response, but is asymmetrical in the vertical plane. (Measurement axis same as for a single UPA-1C).

[3] Frequency response 50Hz – 16kHz, half-space conditions.

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