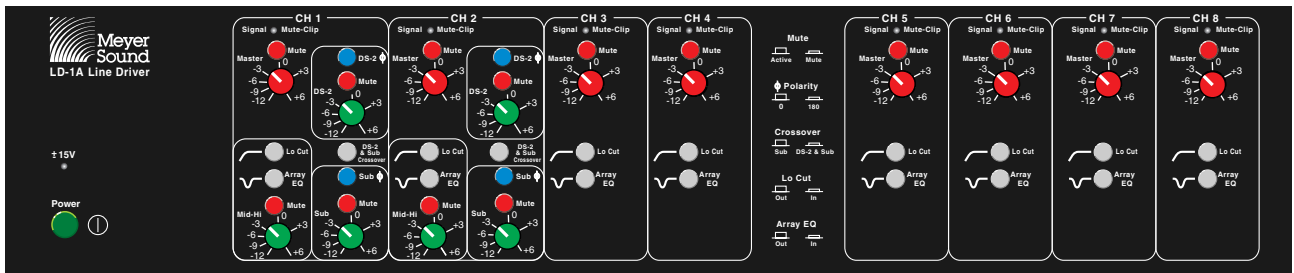


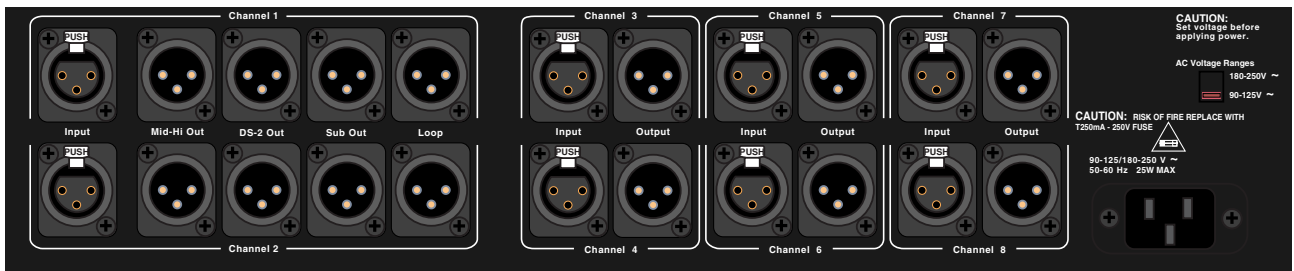
LD-1A

Line Driver

Patents Pending







LD-1A Front Panel



LD-1A Rear Panel

Symbols Used

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

			
<i>Dangerous voltages: risk of electric shock</i>	<i>Important operating instructions</i>	<i>Frame or chassis</i>	<i>Protective earth ground</i>
<i>Pour indiquer les risques résultant de tensions dangereuses</i>	<i>Pour indiquer important instructions</i>	<i>Masse, chassis</i>	<i>Terre de protection</i>
<i>Zu die gefahren von gefährliche spanning zeigen</i>	<i>Zu wichtige betriebs- anweisung und unter- haltsanweisung zeigen</i>	<i>Rahmen oder chassis</i>	<i>Die schutzerde</i>
<i>Para indicar azares provengo de peligroso voltajes</i>	<i>Para indicar importante funcionar y mantenimiento instrucciones</i>	<i>Armadura o chassis</i>	<i>Tierra proteccionista</i>

Declaration of Conformity

According to ISO/IEC Guide and EN 45014

The Manufacturer:

Name: Meyer Sound Laboratories
Address: 2832 San Pablo Avenue
Berkeley, California 94702-2204, USA

declares that the product:

Product Name: LD-1A
Product Options: All

conforms to the following Product Specifications:

Safety:	EN 60065: 1994
EMC:	EN 55022: 1987 - Class A
	IEC 801-2: 1984 - 8 kV
	IEC 801-3: 1984 - 3 V/m
	IEC 801-4: 1984 - 0.5 kV Signal Lines, 1.0 kV Power Lines

The product herewith complies with the requirements of the Low Voltage Directive 73/23/EEC and the EMC Directive 89/336/EEC.

**Office of Quality Manager
Berkeley, California USA
April 1, 1997**

Environmental Specifications for Meyer Sound Electronics Products	
Operating temperature:	0 C to +45 C
Non-operating temp:	< ñ40 C or > +75 C
Humidity:	to 95% at 35 C
Operating altitude:	to 4600 m (15,000 ft)
Non-operating altitude:	to 6300 m (25,000 ft)
Shock:	30 g 11 msec half-sine on each of 6 sides
Vibration:	10 ñ 55 Hz (0.010 m peak-to-peak excursion)

Made by Meyer Sound Laboratories
Berkeley, California USA
European Office:
Meyer Sound Lab. GmbH
Carl Zeiss Strasse 13
56751 Polch, Germany




Contact Information

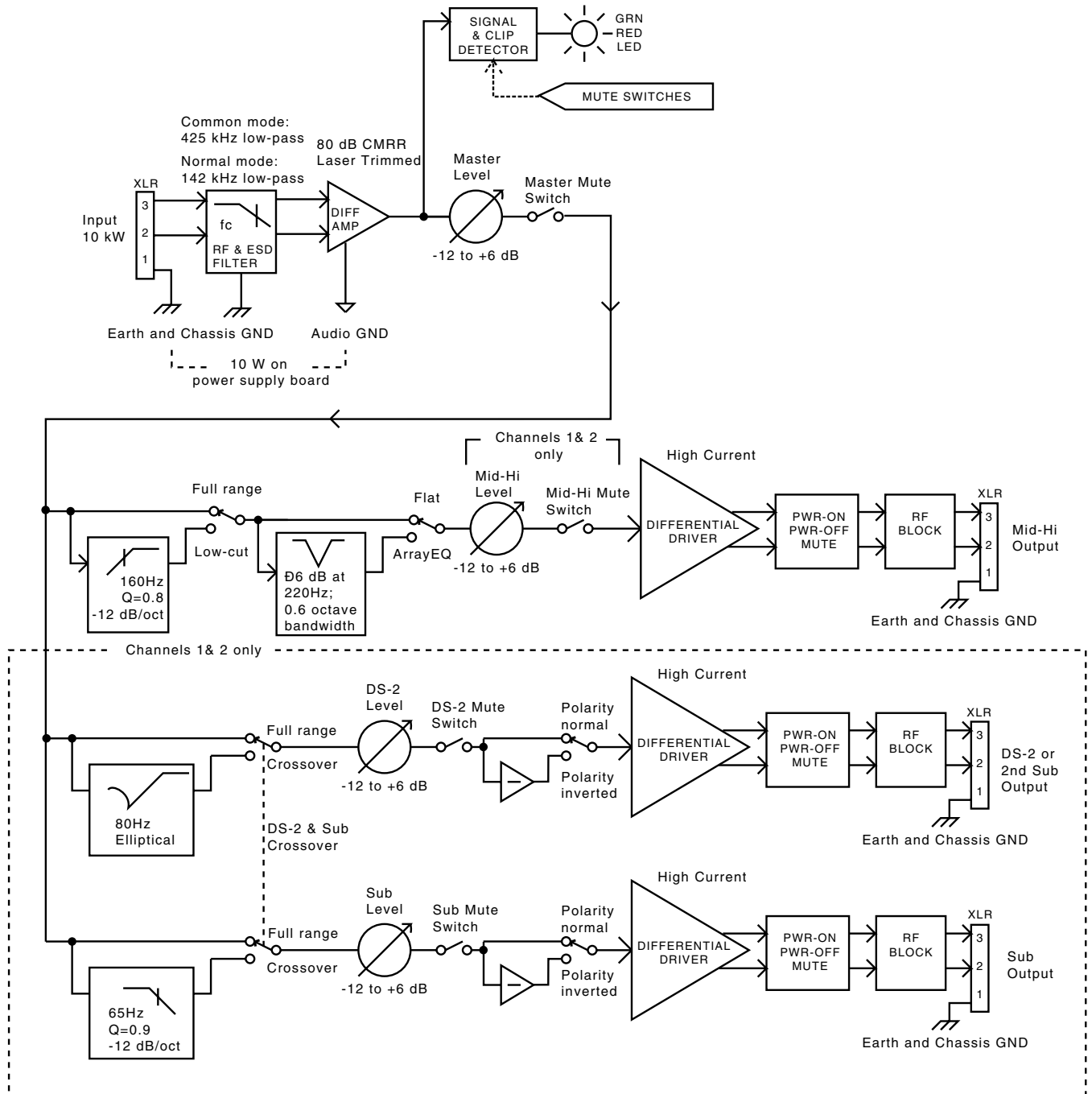
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LD-1A Signal Flow Diagram



Introduction

The Meyer **LD-1A Line Driver** combines functions previously accessed on the control electronics units for externally amplified Meyer loudspeakers with new features, and locates them in a self-contained device accessible to the sound engineer during setup and performance. The LD-1A

- integrates different types of Meyer self-powered speakers into a full-range main system;
- provides gain, mute, and optimized EQ controls for six auxiliary systems;
- maintains signal integrity for long cable paths.

Channels 1 and 2, equipped to control the main system, each have:

- a gain control, mute switch, and crossover function;
- separate **Mid-Hi**, **DS-2** (mid-bass), and **Sub** output controls;
- a male XLR **Loop** connector to route the input signal to an auxiliary channel or another device.

The six auxiliary channels (3–8) control down-fill, front-fill, and delay systems. Auxiliary channels can also be used to divide a main system into subsystems, allowing independent signal levels for speakers directed at different audience locations. Each auxiliary channel has a mute switch, gain control, and Lo Cut and Array EQ filters. All eight channels are fully independent from each other.

The LD-1A occupies two rack spaces and is constructed with a 16-gauge steel chassis and 1/8" aluminum rack ears. This rugged design provides protection from accidental impact, magnetic isolation from nearby devices, and EMI immunity.

Meyer Speaker Types

The following Meyer self-powered speakers are mentioned in this document.

MSL-4	Self-powered mid-hi speaker
CQ Series	Self-powered mid-hi speaker
DS-2P	Self-powered mid-bass speaker
650-P	Self-powered subwoofer
PSW-2	Self-powered subwoofer

Audio Input

The LD-1A presents a 10 kOhm balanced input impedance to a three-pin XLR connector wired with the following convention:

Case — Earth (AC) ground and chassis

Pin 1 — Earth (AC) ground and chassis

Pin 2 — Signal

Pin 3 — Signal

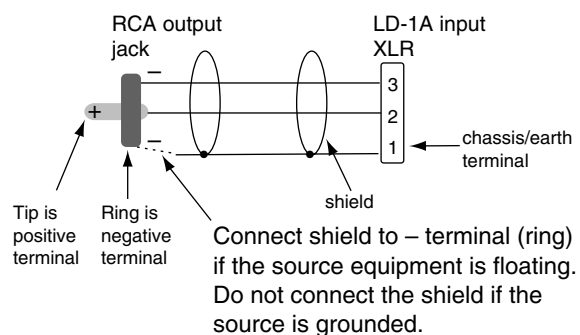
Differential Inputs

The LD-1A is balanced in and out, and consequently has no hot (+) pin. Pins 2 and 3 carry the input as a differential signal. Use standard audio cables with XLR connectors for balanced signal sources.

The audio input signal should always be applied between pins 2 and 3. Pin 1 is connected to chassis and acts as a safety and current bleed to earth for the EMI and ESD interference coupled onto the shield of the input cable. Pin 1 is therefore a *noisy* ground, and connecting an audio signal between pins 1 and 2, or pins 1 and 3, results in a noisy audio signal.

Most modern balanced audio sources (electronically balanced or transformer output) conform to the wiring convention described above and interface correctly with the LD-1A. However, an audio source may produce noise if it connects pin 1 to a quiet internal audio ground, and is then connected to pin 1 of the LD-1A (chassis/earth). To alleviate this noise, try disconnecting pin 1 (or the cable shield) of the audio source.

To connect an unbalanced audio source to the LD-1A, use the following wiring connections:

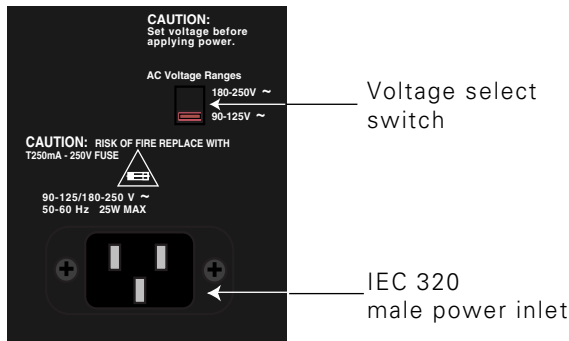


AC Power

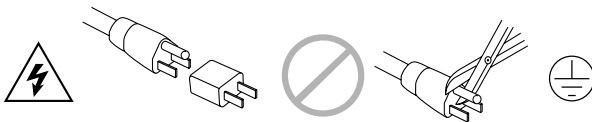
AC Inlet and Voltage Select Switch

The LD-1A uses an international standard IEC 320 Mains AC inlet. This convenient rear panel receptacle accepts many power cord types for mains outlets used throughout the world. The LD-1A *must* have the correct power cord for the AC power in the area in which it will be used.

The LD-1A operates in two AC voltage ranges: 90 – 125 V and 180 – 250 V, at 50 or 60 Hz. The **voltage select** switch on the rear panel must be set to the proper voltage *before* applying AC power. Connecting the LD-1A to a 225 V AC source with the voltage select switch in the 90 – 125 V position could blow the fuse. *Unplug the power cord before changing the voltage select switch!*



The audio outputs are muted internally during normal power on and off, and in case of sudden loss of AC power or unstable line voltage. This precaution prevents noise transmission, and possible damage, to interconnected devices.



Don't use a ground-lifting adapter or cut the AC ground pin.

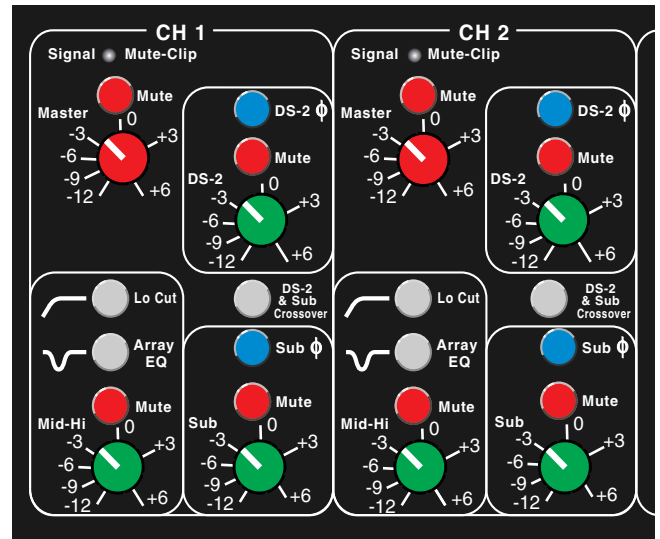
To avoid electrical shock and damage to the unit, use the power cord specified by Meyer Sound or an equivalent that satisfies the requirements of the local safety testing agency. Do not operate the unit if the power cables are frayed or broken.

AC Fuse

Always disconnect the power cord before changing the fuse. To replace the fuse, insert a flat-blade screwdriver in the fuse cap and gently turn counterclockwise; the fuse springs from its socket. Replace only with a 5 x 20 mm, T 250 mA, 250 V, time-lag fuse that conforms to identical safety agency standards. If the fuse blows again, contact Meyer Sound for repair information.

Main Channels 1 and 2

Channels 1 and 2 are equipped to control a full-range main system. Each channel has a **Signal/Mute-Clip** LED indicator, mute switch, gain control, **Mid-Hi**, **DS-2**, and **Sub** output controls, and a male XLR Loop connector.



The **Master** gain control sets the channel's overall level. The **Mute** switch mutes the entire channel. The bicolored **Signal/Mute-Clip** LED indicates input signal presence and level with a variable intensity green color, and clipping or mute with red. The **Loop** connector is used to send the input signal to an auxiliary channel or to another device.

The **Mid-Hi**, **DS-2** (mid-bass), and **Sub** outputs each have a level control and mute switch. The level control modifies the level set by the channel's Master gain control; the mute switch affects the Mid-Hi, DS-2, or Sub output only. For example, the Mid-Hi output could be muted without affecting the Loop, Sub, or DS-2 outputs. Additional functions specific to each output are described in the following sections.

Mid-Hi Output

The Mid-Hi output has two switch-activated, optimized filters. Pushing the **Lo Cut** switch **in** activates a high-pass filter (160 Hz, Q = 0.8, -12 dB/octave) that performs a crossover function for the Mid-Hi output. The filter is bypassed with the switch **out**.

Pushing the **Array EQ** switch **in** activates a filter (6 dB cut at 220 Hz, 0.6 octave bandwidth) to equalize the low-mid rise produced by three to five horizontally arrayed MSL-4s. The filter is bypassed with the switch **out**.

NOTE: The Array EQ filter compensates for MSL-4 array characteristics in free-space. We recommend using the Meyer SIM System II Sound Analyzer and CP-10 Parametric Equalizer to measure and correct problems caused by the acoustical environment.

It is important to note that the Mid-Hi output produces a full-range signal when both the Array EQ and Lo-Cut filters are **out** (bypassed).

DS-2 and Sub Outputs

The **DS-2 & Sub Crossover** network, optimized for the DS-2P and 650-P (or PSW-2), is composed of a low-pass and an elliptical filter. Pushing the switch **in** activates the two-way crossover, sending frequencies below 80 Hz to the Sub output and above 80 Hz to the DS-2 output.

With the switch **out**, a full-range signal is sent to both the DS-2 and Sub outputs. When the DS-2P is used alone as a subwoofer, or is not included in the system, the switch should be **out**.

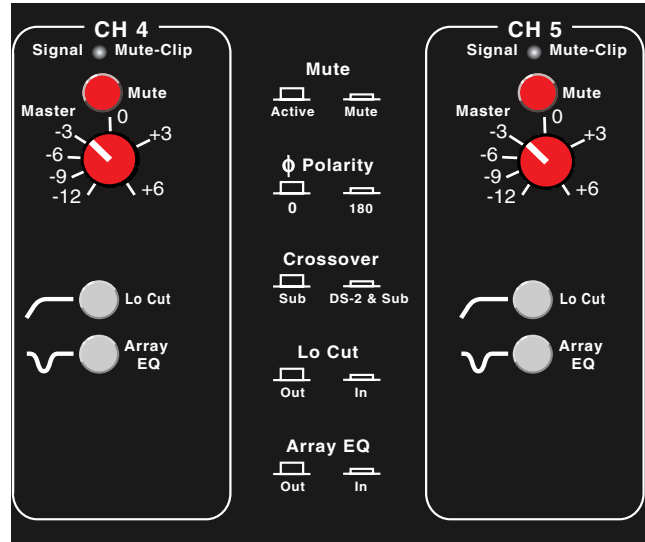
NOTE: Full-range signals may be applied to Meyer self-powered subwoofers because they have built-in active crossovers that filter mid-hi frequencies; external crossovers are unnecessary.

The DS-2 and Sub outputs each have a polarity toggle (DS-2 ϕ , Sub ϕ). With the switch **out**, the polarity is set to 0°. Pushing the switch **in** inverts the polarity 180° with respect to the **out** position.

Auxiliary Channels 3-8

The six auxiliary channels 3-8 control down-fill, front-fill, and delay systems. Each channel has a Signal/Mute-Clip indicator, gain control, mute switch, and Lo Cut and Array EQ filters, all of which are explained in the previous section.

Channels 3-8 are identical; channels 4 and 5 are shown below.



Auxiliary channels 4 and 5 with switch function summary.

The auxiliary channels can also divide the main system into separate subsystems. For example:

1. Route the CH 1 input signal to CH 3 using the CH 1 Loop connector.
2. Connect the CH 3 output to the outer two elements of an array of five mid-hi speakers.
3. Connect the Mid-Hi output to the inner three elements of the mid-hi array.

Using main and auxiliary channels to apply separate levels for the edge and internal elements of a mid-hi system is incorporated into an example configuration on page 8.

Example Configurations

This section demonstrates the flexibility and utility of the LD-1A with four example applications.

Speaker Placement and Polarity

The cabinets in the following example configurations are in a close-proximity coplanar orientation, unless otherwise stated. Placing speakers more than 5 feet apart may require setting them to opposite polarities to compensate for the propagation delay between speakers.

Measurement and Correction

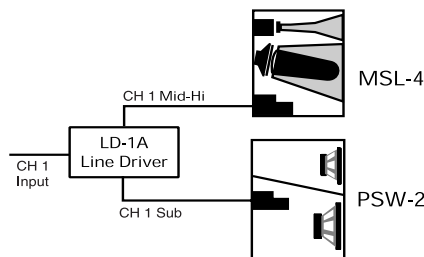
Measurement and correction tools are required to assemble a complete sound system, particularly when the venue requires precise array design, delay systems, or compensation for significant reverberation. We recommend using the Meyer SIM® System II Sound Analyzer and CP-10 Parametric Equalizer to

- assist the process of choosing and configuring speakers;
- measure propagation delays between subsystems to set the correct polarity and delay times;
- measure and equalize variations in frequency response caused by the acoustical environment and the placement and interaction of speakers.

Contact Meyer Sound for assistance with your application.

MSL-4 and PSW-2

The MSL-4 and PSW-2 form a compatible full-range system. However, due to an overlap in LF (low frequency) response between the two speakers, there is a rise in the system frequency response in the range 65–120 Hz. It is important to emphasize that the speakers are in phase in this region. The rise can be eliminated by activating the Lo Cut filter for the Mid-Hi output, if desired.



Set the MSL-4 and PSW-2 to the same polarity.

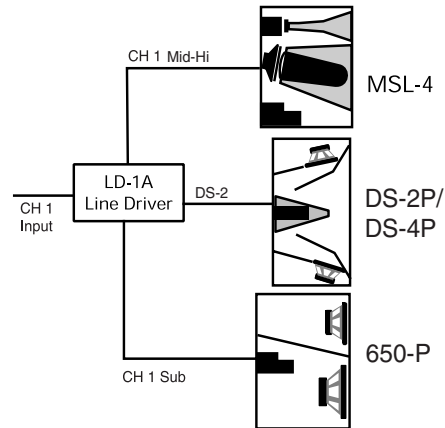
Although a typical MSL-4:PSW-2 ratio is 2:1, the Sub and Mid-Hi gain controls allow the ratio to vary while maintaining control of the spectral balance of the system.

The 650-P can be used interchangeably with the PSW-2 but the 650-P's larger size precludes tight-packing configurations with the MSL-4; the 650-P also lacks rigging hardware.

MSL-4, DS-2P, and 650-P

Adding the DS-2P to an MSL-4/650-P system enhances LF power and clarity. With the DS-2 & Sub Crossover switch **in**, the DS-2 and Sub outputs each receive signals optimized for the frequency response capabilities of the DS-2P and 650-P.

The MSL-4 is driven from the CH 1 Mid-Hi output with the Lo Cut filter **in** to minimize the overlap in frequency response with the DS-2P and 650-P. Set the 650-P to the opposite polarity to the MSL-4 and DS-2P.

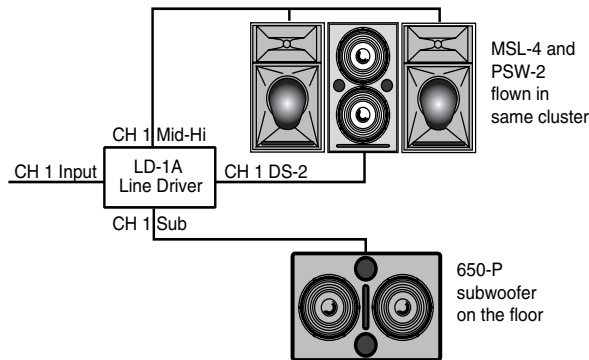


Set the 650-P to the opposite polarity to the DS-2P and MSL-4.

PSW-2 Flown with MSL-4; 650-P on the Floor

Including subwoofers in a flown cluster provides a smooth frequency image because the low and mid-hi frequencies are produced from speakers located close together. The identical dimensions of the PSW-2 and MSL-4 allow them to be easily flown together.

The CH 1 Mid-Hi output drives the MSL-4 with the Lo Cut filter **in**. The CH 1 Sub and DS-2 outputs drive the 650-Ps and PSW-2s with the DS-2 & Sub Crossover switch **out**, sending a full-range signal to each speaker with independent levels.



Set the MSL-4 and PSW-2 to the same polarity. The polarity of the 650-P depends on the height and distance of the measurement position from the subwoofers and flown cluster.

MSL-4, DS-2P, 650-P with CQ Down-fill

This example shows the LD-1A integrating a complete system of self-powered speakers for a large venue. The diagram shows half of the system using channels 1, 3, and 5; identical connections can be used for channels 2, 4, and 6 to create the other half. The MSL-4, DS-2P, and CQ arrays are flown; the 650-Ps are on the floor.

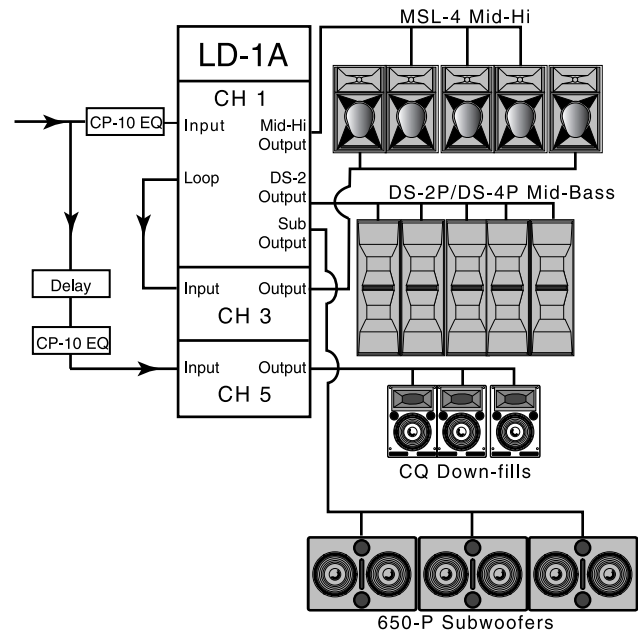
The CH 1 Mid-Hi and CH 3 outputs drive the inner three and outer two speakers of the MSL-4 array, applying appropriate levels for speakers directed at different distances. The diagram shows the additional mid-hi output created by connecting the CH 1 Loop to the CH 3 input. Using a Y-connection at the CH 1 input (as shown for the CQ down-fills) accomplishes the same signal routing. The Lo Cut and Array EQ switches for CH 1 and 3 should be **in**. The Lo Cut filters eliminate the LF rise caused by the overlap in frequency response between the MSL-4 and DS-2P/650-P systems. The Array EQ filters minimize the MSL-4 array's low-mid rise.

The CH 1 DS-2 and Sub outputs drive the DS-2P and 650-P systems with the DS-2 & Sub Crossover switch **in**. Set the MSL-4 and DS-2P to the same polarity. The polarity of the 650-P depends on the height and distance of the measurement position from the subwoofer and flown systems.

CH 5 controls the CQ down-fill system. Since the main system is more powerful than the down-fill system to project farther into the venue, the main system is audible in the down-fill's coverage area. To insure that the speakers combine properly in the intersecting coverage area:

- Set the CQ to the opposite polarity to the MSL-4 to phase align the mid-hi frequencies and minimize the MSL-4's LF down-lobe.
- Use the CH 5 Lo Cut filter to eliminate the LF rise caused by the overlap in frequency response with the 650-P and DS-2P systems.
- Delay the down-fill to compensate for the propagation delay between the down-fill and main systems in the intersecting coverage area.

We recommend that the entire system be measured, phase-aligned, and equalized using the SIM System II Sound Analyzer and CP-10 Parametric Equalizer.



Set the MSL-4 and DS-2P to the same polarity; reverse the polarity of the CQ. The polarity of the 650-P depends on the distance of the measurement position from the subwoofer and flown systems.



Safety Summary



English

- To reduce the risk of electric shock, disconnect the LD-1A from the AC mains before installing audio cable. Reconnect the power cord only after making all signal connections.
- Connect the LD-1A 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 allow water or any foreign object to get inside the LD-1A. Do not put objects containing liquid on, or near, the unit.
- To reduce the risk of overheating the LD-1A, avoid exposing it to direct sunlight. Do not install the unit near heat emitting appliances, such as a room heater or stove.
- The LD-1A contains potentially hazardous voltages. Do not attempt to disassemble the unit. The unit contains no user serviceable parts. Repairs should be performed only by factory trained service personnel.

Français

- Pour réduire le risque d'électrocution, débranchez la prise principale de l'haut-parleur, avant d'installer le câble d'interface allant à l'audio. Ne rebranchez le bloc d'alimentation qu'après avoir effectué toutes les connexions.
- Branchez l'haut-parleur dans une prise de courant à 3 dérivations (deux pôles et la terre). Cette prise doit être munie d'une protection adéquate (fusible ou coupe-circuit). Le branchement dans tout autre genre de prise pourrait entraîner un risque d'électrocution et peut constituer une infraction à la réglementation locale concernant les installations électriques.
- Ne pas laisser de l'eau ou tout objet pénétrer dans l'haut-parleur. Ne pas placer de récipients contenant un liquide sur cet appareil, ni à proximité de celui-ci.
- Pour éviter une surchauffe de l'haut-parleur, conservez-la à l'abri du soleil. Ne pas installer à proximité d'appareils dégageant de la chaleur tels que radiateurs ou appareils de chauffage.
- Ce haut-parleur contient des circuits haute tension présentant un danger. Ne jamais essayer de le démonter. Il n'y a aucun composant qui puisse être réparé par l'utilisateur. Toutes les réparations doivent être effectuées par du personnel qualifié et agréé par le constructeur.

Deutsch

- Um die Gefahr eines elektrischen Schlages auf ein Minimum zu reduzieren, den Lautsprecher vom Stromnetz trennen, bevor ggf. ein Audio-Schnittstellensignalkabel angeschlossen wird. Das Netzkabel erst nach Herstellung aller Signalverbindungen wieder einstecken.
- Der Lautsprecher an eine geerdete zweipolige Dreiphasen-Netzsteckdose anschließen. Die Steckdose muß mit einem geeigneten Abzweigschutz (Sicherung oder Leistungsschalter) verbunden sein. Der Anschluß der unterbrechungsfreien Stromversorgung an einen anderen Steckdosentyp kann zu Stromschlägen führen und gegen die örtlichen Vorschriften verstoßen.
- Darauf achten, daß weder Wasser noch Fremdkörper in das Innere den Lautsprecher eindringen. Keine Objekte, die Flüssigkeit enthalten, auf oder neben die unterbrechungsfreie Stromversorgung stellen.
- Um ein Überhitzen dem Lautsprecher zu verhindern, das Gerät vor direkter Sonneneinstrahlung fernhalten und nicht in der Nähe von wärmeabstrahlenden Haushaltsgeräten (z.B. Heizgerät oder Herd) aufstellen.
- Im Inneren diesem Lautsprecher herrschen potentiell gefährliche Spannungen. Nicht versuchen, das Gerät zu öffnen. Es enthält keine vom Benutzer reparierbaren Teile. Reparaturen dürfen nur von ausgebildetem Kundendienstpersonal durchgeführt werden.

Español

- Para reducir el riesgo de descarga eléctrica, desconecte de la red el altoparlante antes de instalar el cable de señalización de interfaz de la segnale. Vuelva a conectar el conductor flexible de alimentación solamente una vez efectuadas todas las interconexiones de señalización.
- Conecte el altoparlante a un tomacorriente bipolar y trifilar con neutro de puesta a tierra. El tomacorriente debe estar conectado a la protección de derivación apropiada (ya sea un fusible o un disyuntor). La conexión a cualquier otro tipo de tomacorriente puede constituir peligro de descarga eléctrica y violar los códigos eléctricos locales.
- No deje que en el altoparlante entre agua ni ningún objeto extraño. No ponga objetos con líquidos encima de la unidad ni cerca de ella.
- Para reducir el riesgo de sobrecalentamiento, no exponga la unidad a los rayos directos del sol ni la instale cerca de artefactos que emiten calor, como estufas o cocinas.
- Este altoparlante contiene niveles de voltaje peligrosos en potencia. No intente desarmar la unidad, pues no contiene piezas que puedan ser reparadas por el usuario. Las reparaciones deben efectuarse únicamente por parte del personal de mantenimiento capacitado en la fábrica.

Specifications

Architecture	
Main (Channels 1, 2)	
Master Gain Control	-12 to +6 dB
Mid-Hi, DS-2, Sub Gain Controls	-12 to +6 dB
Low-cut Filter for Mid-Hi Output	160 Hz high-pass, -12 dB/octave, Q = 0.8
Array EQ Filter for Mid-Hi Output	6 dB cut at 220 Hz, 0.6 octave bandwidth
Mute	Mute switches for Master, Mid-Hi, DS-2, and Sub outputs
Polarity	Toggles for Sub and DS-2 outputs
Auxiliary (Channels 3-8)	
Gain Control	-12 to +6 dB
Low-cut Filter	160 Hz high-pass, -12 dB/octave, Q = 0.8
Array EQ Filter	6 dB cut at 220 Hz, 0.6 octave bandwidth
Mute	Mutes the channel output
Audio Inputs	
Connector	1 female XLR per channel
Type	Differential balanced input circuit
Impedance	10 k differential (between pins 2 and 3)
Wiring	<i>Pin 1:</i> chassis/earth ground; <i>Pin 2:</i> signal; <i>Pin 3:</i> signal
RF Filter	Common Mode: 425 kHz low-pass; Differential Mode: 142 kHz low-pass
Common Mode Rejection Ratio	> 80 dB (typically 90 dB); measured in the range 50 Hz -1 kHz
Signal Presence LED (Variable intensity; monitored at the input for each channel)	
Threshold	-26 dBV (50 mVrms) pink noise or sinewave
Full Intensity	-10 dBV (300 mVrms) pink noise or sinewave
Audio Outputs	
Type	Balanced, cross-coupled simulated transformer topology
Impedance	50 Ohm balanced (between pins 2 and 3)
RF Filter	Pins 2 and 3 shunted to chassis via 500 pF capacitance
Connectors	
Main	4 female XLR/channel (Mid-Hi, DS-2, Sub, Loop)
Auxiliary	1 female XLR/channel
Wiring	<i>Pin 1:</i> chassis/earth ground; <i>Pin 2:</i> signal; <i>Pin 3:</i> signal
Drive Capability	
Maximum Voltage ¹	600 Ohm Load: ±22.5 Vpk (+24 dBV, +26.2 dBu sinewave) No Load: ±25.0 Vpk (+25 dBV, +27.2 dBu sinewave)
Maximum Current	±70 mA _{pk} (10 Vrms into 200 Ohm)
Cables and Load	Drives > 100,000 pF (> 1000 ft cable) without instability or distortion
AC Power	
Connector	IEC 320 (line, neutral/line, earth)
Operating Voltage	90 - 125 VAC / 180 - 250 VAC (selectable with rear panel switch); 50/60 Hz
Maximum Power	25 Watts; Fuse: 5 x 20 mm, T 250 mA, 250 V, time-lag
Audio Performance	
Frequency Response	< ±0.2 dB 20 Hz - 20 kHz
Bandwidth	DC to 60 kHz (-3dB)
Phase Response	< ±3° from pure 3 μsec delay (DC - 20 kHz)
Dynamic Range ²	> 120 dB
Noise Floor ³	> -95 dBV A-weighted; > -90 dBV un-weighted
THD + N ⁴	< 0.005% (typically 0.002%)
Gain Accuracy	< ±0.15 dB at +6 dB gain; < ±0.25 dB at 0 dB gain
Mute Attenuation	> 100 dB
Gain Range	
Main Channels	-24 to +12 dB
Auxiliary Channels	-12 to +6 dB
Physical	
Dimensions	Height: 3.45 inches (2 rack spaces); Width: 16.75 inches; Depth: 6.96 inches
Weight	13.5 lb (6.1 kg); shipping: 15 lb (6.8 kg)
Enclosure/Finish	Black 16-gauge steel chassis; 1/8 inch aluminum rack ears

Notes

1. 0 dBV = 1 Vrms; 0 dBu = 0.775 Vrms; 0 dBm = 1 mWrms 3. Level set to unity gain (0 dB).
2. Ratio of maximum sinewave to A-weighted noise floor. 4. 0 dBV, 1 kHz sinewave input. Gain at +12 dB main channel, +6 dB auxiliary channel.