Owner's Manual

Nº436
Nº434

mark levinson®
MADRIGAL AUDIO LABORATORIES

Important Safety Instructions

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 a dry cloth.
7. Do not block ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or another apparatus that produces heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding-type plug has two blades and a third grounding prong. The wide blade or third prong is provided for safety. If the provided plug does not fit into the outlet, consult an electrician for replacement of the obsolete outlet.
10. The MAINS cord is intended to be the safety disconnect device for this apparatus. Ready access to the MAINS cord shall be maintained at all times.
11. Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles, or the point where it exits from the apparatus.
12. Only use attachments and accessories specified by the manufacturer.
13.  Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury or tip over.
14. Unplug this apparatus during lightning storms or when unused for long periods of time.
15. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as when the power cord or plug has been damaged; liquid has been spilled or objects have fallen into the apparatus; or the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
16. Ventilation should not be impeded by covering the ventilation openings with items such as newspapers, table cloths, curtains, etc.
17. No naked flame sources, such as candles, should be placed on the apparatus.
18.  Terminals marked with this symbol may be considered HAZARDOUS LIVE and the external wiring connected to these terminals requires installation by an INSTRUCTED PERSON or the use of ready-made leads or cords.

Warning!

To reduce the risk of fire or electric shock, do not expose the apparatus to rain or moisture. Do not place objects containing liquid, such as vases, on this apparatus.

FCC Notice

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult an authorized Mark Levinson dealer or an experienced radio/TV technician for help.

Caution!

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Canada

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

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Part No. 070-630430 | Rev 6 | 07/04

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Documentation Conventions

This document contains general safety, installation, and operation instructions for the Nº436/434 Power Amplifiers. It is important to read this document before attempting to use these components. Pay particular attention to safety instructions.

Appears on the component to indicate the presence of uninsulated, dangerous voltages inside the enclosure – voltages that may be sufficient to constitute a risk of shock.

Appears on the component to indicate important operation and maintenance instructions included in the accompanying documentation.

Appears on the component to indicate compliance with the EMC (Electromagnetic Compatibility) and LVD (Low-voltage Directive) standards of the European Community.

Warning! ***Calls attention to a procedure, practice, condition, or the like that, if not correctly performed or adhered to, could result in personal injuries or death.***

Caution! ***Calls attention to a procedure, practice, condition, or the like that, if not correctly performed or adhered to, could result in damage or destruction to part or all of the component.***

Note *Calls attention to information that is essential to highlight.*

Special Design Features

Thank you for purchasing the Nº436/434 Monaural Power Amplifier, combining the massive power and strength of a large power amplifier with the elegance and finesse of a small power amplifier. This section describes some of the design features that make this unique combination possible.

Massive Power Supply

The Nº436/434 uses a large, robust power supply with a high-capacity, low-noise toroidal transformer and four large, low ESR (Equivalent Series Resistance) capacitors. Specifically, the Nº436 uses a 2372 VA transformer with 80,000µF total capacitance, while the Nº434 uses an 801 VA transformer with 72,000µF total capacitance.

Heavy, oxygen-free copper bus bars enhance the efficiency of power distribution with the power amplifier, eliminating variances caused by wiring harnesses, which are commonly found even in high-performance power amplifiers. High-frequency power supply bypass is accomplished on individual PC boards by five types of components. As a result, a uniformly low power supply impedance is seen by various circuits within the power amplifier providing the foundation for a rare combination of massive power and extraordinary finesse.

Balanced Design

A truly balanced input topology eliminates the need for an input buffer amplification stage, allowing the source to directly drive the first stage differential amplifier. Matched impedances are presented to the source as both signals travel identical circuit paths. Meticulous attention to detail, including careful mirror-imaging of circuits, minimizes magnetic field distortions that can be caused by such a massive power delivery system. Balanced input signals remain balanced throughout voltage gain stages, achieving rejection of common mode noise and distortion in the final, current gain stage.

Special Design Features (continued)

True Voltage Source

The №436/434 operates as a true voltage source, maintaining the appropriate voltage within its rated voltage output according to the demands of the source material rather than the current demands of the loudspeaker. As a result, the №436/434 doubles its power output each time loudspeaker impedance is cut in half. For example, the №436 offers rated power at 350W per channel at 8Ω and 700W per channel at 4Ω.

To control the flow of its remarkable power capabilities to the loudspeakers, the №436 uses 16 TO-3P output transistors in eight matched, complementary pairs per channel. Similarly, the №434 uses eight TO-3P output transistors in four matched, complementary pairs per channel.

Although most loudspeakers cannot absorb the continuous full power capabilities of the №436, many high-quality loudspeakers require extreme short-term power levels when reproducing music at realistic levels. The №436/434 can meet these demands without power supply "sag" or sonic performance alterations, allowing either power amplifier to reproduce music with amazing authority and control. Power needs depend on listening habits, the listening room, and associated loudspeakers.

Adaptive Bias

The №436/434 uses a proprietary adaptive biasing scheme to deliver the advantages of a Class A output stage without the associated thermal management problems and sonic compromises. This unique adaptive biasing scheme does not allow output devices to be reverse-biased, replacing dynamic distortions with a sweeter sound that provides a greater sense of ease regardless of volume level. Contact an authorized Mark Levinson dealer for additional information about Adaptive Bias.

Extensive Protection

Designed to prevent damage to itself and associated components, the №436/434 is armed with several protective features. For example, the AC input to each transformer is fused to protect against excessive current conditions that occur when shorted outputs are driven. Inrush limiting prevents premature aging of power supply components during power cycles, switching off-line once the power supply is charged. And, a controlled-clipping circuit prevents output devices from saturating, using wave-shaping action to avoid the harsh, high-frequency harmonics generated by hard-clipped output devices.

In addition, the Nº436/434 uses state-of-the-art protections to guard against the following ***fault conditions***:

- ***Signal-related faults***, including the presence of DC (direct current) signals at the output and demands for excessive current at the output (indicating a short-circuit). If a ***signal-related fault*** is detected, the front panel ***indicator LED*** blinks rapidly, remaining lit and unlit for equal intervals. The Nº436/434 shuts itself down to protect itself and associated loudspeakers. To restore normal operation, remove the source of the fault. Then, power cycle the Nº436/434 using the ***power button***.

- ***Power-related faults***, including over or under-voltage (±10%) conditions at the ***~ac mains connector.*** If AC mains voltage is too high or too low for safe operation, the front panel ***indicator LED*** blinks rapidly, remaining lit for longer intervals. Normal operation will not be restored until AC mains voltage falls back into a safe operating range.

  For example, a 120V model of the Nº436/434 will operate from approximately 108-132V, while a 240V model of the Nº436/434 will operate from approximately 216-264V. Outside of these limits, the Nº436/434 will activate ***sleep mode***. When AC mains voltage returns to the safe operating range, the Nº436/434 can be taken out of ***sleep mode*** using the ***standby button***.

- ***Thermal-related faults***, such as if the Nº436/434 becomes overheated. The front panel ***indicator LED*** blinks rapidly, remaining unlit for longer intervals. The Nº436/434 automatically activates ***sleep mode*** and remains in ***sleep mode*** until output heat sink temperatures drop below 85˚C (185˚F or 358K). When temperatures return to a safe operating range, the Nº436/434 can be taken out of ***sleep mode*** using the ***standby button***.

Unpacking

Warning!

***DO NOT** attempt to lift or move the N°436/434 without adequate assistance. Failure to follow the procedures included in this section may result in personal injuries and/or product damage.*

The Nº436 and Nº434 are massive power amplifiers. The Nº436 ships at 95 pounds (43.2kg) and the Nº434 ships at 65 pounds (29.5kg). Rear panel handles are provided for safe, convenient lifting and moving. Proper lifting requires at least two people.

Caution!

***DO NOT** attempt to lift the N°436/434 from its packing carton alone.*

***DO NOT** attempt to lift the N°436/434 while bending at the waist. When lifting, stand as straight as possible using the leg muscles to lift.*

When unpacking the Nº436/434:

- ***DO*** save all packing materials for possible future shipping needs.
- ***DO*** inspect the Nº436/434 for signs of damage during shipment. If damage is discovered, contact an authorized Mark Levinson dealer for assistance making appropriate claims.

Product Registration

Please register the Nº436/434 within 15 days of purchase. To do so, register online at www.marklevinson.com or complete and return the included product registration card. Product registration serves no warranty purposes. Retain the original, dated sales receipt as proof of warranty coverage.

Installation Considerations

The Nº436/434 requires special care during installation to ensure optimal performance. Pay particular attention to the precautions included in this section and to other precautions included throughout this owner's manual.

Placement

- **DO** review *"Important Safety Instructions"* and *"Power Requirements"* before installing the Nº436/434.
- **DO** place the Nº436/434 on a solid, flat, level surface such as a table, shelf, or floor OR bolt the Nº436/434 into a rack-mounting system. Use a purpose-built rack-mounting system to accommodate the weight of the power amplifier. Refer to *"Rack-Mounting"* for additional information.
- **DO** position the Nº436/434 close to associated loudspeakers to keep loudspeaker wires as short as possible. Use longer interconnecting cables between the preamplifier and the power amplifier. This is preferable because interconnecting cables pass low-voltage signals, which transmit over distances with greater accuracy than the high-voltage signals required by loudspeakers.
- **DO** allow at least a 6-inch (15cm) clearance behind the Nº436/434 for the power cord and signal cables to bend without crimping or straining.
- **DO** see *"Dimensions"* for assistance with custom installations.
- **DO NOT** position the Nº436/434 near low-level components. These power amplifiers are capable of producing massive output currents, which could generate significant magnetic fields that induce noise in some sensitive components.
- **DO NOT** place the Nº436/434 on a windowsill or in another location in which it will be exposed to direct sunlight.

Caution!

BEFORE moving the N°436/434, make sure it is powered off using the power button. Then, make sure the power cord is disconnected from the ~ac mains connector and the electrical outlet.

DO NOT attempt to move the N°436/434 without adequate assistance. Proper lifting requires at least two people.

Rack-Mounting

The Nº436/434 can be rack-mounted using the optional rack-mount kit available at authorized Mark Levinson dealers. This purpose-designed kit provides adequate support for the power amplifier as well as proper ventilation for the heat sinks. When rack-mounted, the Nº436 occupies four standard rack units and the Nº434 occupies three standard rack units.

Ventilation

The Nº436/434 uses a sophisticated ventilation system that combines passive convection and active, fan-driven cooling to maintain normal operating temperatures under a wide range of conditions. Heat sinks are crosscut to allow for both horizontal and vertical airflow, ensuring that the Nº436/434 delivers maximum performance and reliability at all times.

When the Nº436/434 is installed in a location with reasonable temperatures and ventilation, convection cooling alone provides adequate heat dissipation at low and moderate listening levels. When operating temperatures exceed a certain level, two temperature-controlled, variable-speed fans automatically activate to provide additional cooling.

Note

The Nº436/434 fans are extremely quiet, even when running relatively hard. In some cases, the fans may be heard when lowering master volume after an extended period of high-volume listening.

*When the Nº436/434 is taken out of **standby**, the fans will activate momentarily to remove excess dust that may have accumulated in the heat sinks.*

- ***DO*** select a dry, well-ventilated location out of direct sunlight.
- ***DO NOT*** obstruct the ventilation holes on the top and bottom of the Nº436/434 or reduce airflow through the Nº436/434.
- ***DO NOT*** place the Nº436/434 on a thick rug or carpet or cover the Nº436/434 with a cloth, as this might prevent proper cooling. If the Nº436/434 is placed on the floor, use a thick piece of tempered glass to provide firm support and proper ventilation.
- ***DO NOT*** expose the Nº436/434 to high temperatures, humidity, steam, smoke, dampness, or excessive dust. Avoid installing the Nº436/434 near radiators and other heat-producing appliances.

Power Requirements

When shipped, the Nº436/434 is configured for 100V, 120V, 220V, 230V or 240V AC power operation at 50 or 60Hz based on the country for which it is manufactured. Before operating the Nº436/434, make sure the ***~ac mains*** connector label indicates the correct operating voltage for the current location.

Caution!

***DO NOT** attempt to adjust the operating voltage. Consult an authorized Mark Levinson dealer if the operating voltage is incorrect or if the operating voltage must be changed for relocation purposes.*

***BE ADVISED** that different operating voltages may require the use of different power cords and/or attachment plugs. Contact an authorized Mark Levinson dealer for assistance.*

The Nº436/434 is capable of passing remarkable musical signals regardless of signal and loudspeaker demands. On either an instantaneous or continuous basis, these power amplifiers can drive exceptional power levels into most all loudspeaker loads. Depending on listening habits, loudspeaker demands, and the number of power amplifiers present in the system – it is possible for the electrical service to become the limiting performance factor.

In this case, consider installing a dedicated AC circuit for the home entertainment system. Contact a licensed electrician for assistance. If more than one AC circuit is providing power to the system, contact a licensed electrician to ensure that all components are operating with the same solid, low-impedance ground reference.

Note

Building regulations and electrical codes differ from location to location, making it impossible to anticipate the requirements of high-current AC circuits such as the Nº436/434 is capable of using. Contact a local, licensed electrician for information.

Warm-up & Break-in Period

Although the Nº436/434 delivers superior performance from the first time it is powered on, this performance will continue to improve as the power amplifier reaches its normal operating temperature and various components “break in.” The greatest performance improvements will occur within the first 25 to 50 hours of use. Sound quality will continue to improve for about 300 hours.

Warm-up & Break-in Period (continued)

After this initial period, performance will remain consistent unless power is disconnected from the Nº436/434. Power is considered disconnected when the Nº436/434 is powered **off** using the **power button**; the **power cord** is disconnected from the **~ac mains** connector or the electrical outlet; or an extended power failure or power outage occurs. Power is not disconnected when the Nº436/434 is in **standby** or **sleep mode**.

When power returns, it is recommended to allow the Nº436/434 and other audio components to stabilize for about 2 minutes. The Nº436/434 will require a brief warm-up and break-in period (not the full 300 hours).

Operating States

The Nº436/434 has four **operating states**:

1. ***Off***

   Power is considered disconnected from the Nº436/434.

2. ***Sleep Mode***

   Power is connected to a small power supply, communication circuits, and control circuits. When taken out of **sleep mode**, the Nº436/434 requires a brief warm-up and break-in period. In **sleep mode**, the Nº436/434 consumes less than 15W of power.

3. ***Standby***

   Power is connected to the main power supply and voltage gain stages. Power is not connected to the output (current gain) stage. Because voltage gain stages are kept at their normal operating temperatures, the Nº436/434 remains warmed-up to deliver an optimal performance. In **standby**, the Nº436/434 consumes about 100W of power (±5%).

4. ***On***

   Power is connected to the Nº436/434.

Note

*The Nº436 and Nº434 are designed to run somewhat warm without causing a safety hazard. The Nº436 dissipates about 175W of heat energy when powered on or idle (not in **standby**), and the Nº434 dissipates about 130W of heat energy when powered on or idle (not in **standby**).*

Continuous Operation

The Nº436/434 should be unplugged during lightning storms and extended periods of non-use. Otherwise, it is designed for continuous operation. For best performance, make sure power is connected to the Nº436/434 at all times. During normal operation, do not use the **power button** to power **off** the Nº436/434. Instead, use the **standby button** to place the Nº436/434 into **standby**, which allows the power amplifier to remain warmed-up to deliver optimal performance at all times.

Front Panel

The numbers in the front panel illustration shown above correspond with the numbered items in this section.

1. Power Button

Powers the №436/434 ***on*** and ***off*** when the ***power cord*** is connected to the ***~ac mains*** connector and an electrical outlet.

- When the №436/434 is powered ***on***, pressing the ***power button*** disconnects power from the №436/434.
- When the №436/434 is powered ***off***, pressing the ***power button*** connects power to the №436/434. The №436/434 automatically enters ***sleep mode*** when powered on.

Note

*The N°436/434 must be powered on using the **power button** to respond to remote trigger commands.*

Front Panel (continued)

2. *standby button*

Places the №436/434 into ***standby*** or ***sleep mode*** and takes the №436/434 out of ***standby*** or ***sleep mode***.

- When the №436/434 is powered on, pressing the ***standby button*** places the №436/434 into ***standby*** or takes the №436/434 out of ***standby***, allowing it to remain warmed-up to deliver an optimal performance at all times.
- Pressing *and holding* the ***standby button*** *for four seconds* places the №436/434 into ***sleep mode***. When the №436/434 is in ***sleep mode***, pressing the ***standby button*** takes the №436/434 out of ***sleep mode***. When taken out of ***sleep mode***, the №436/434 automatically enters ***standby***.

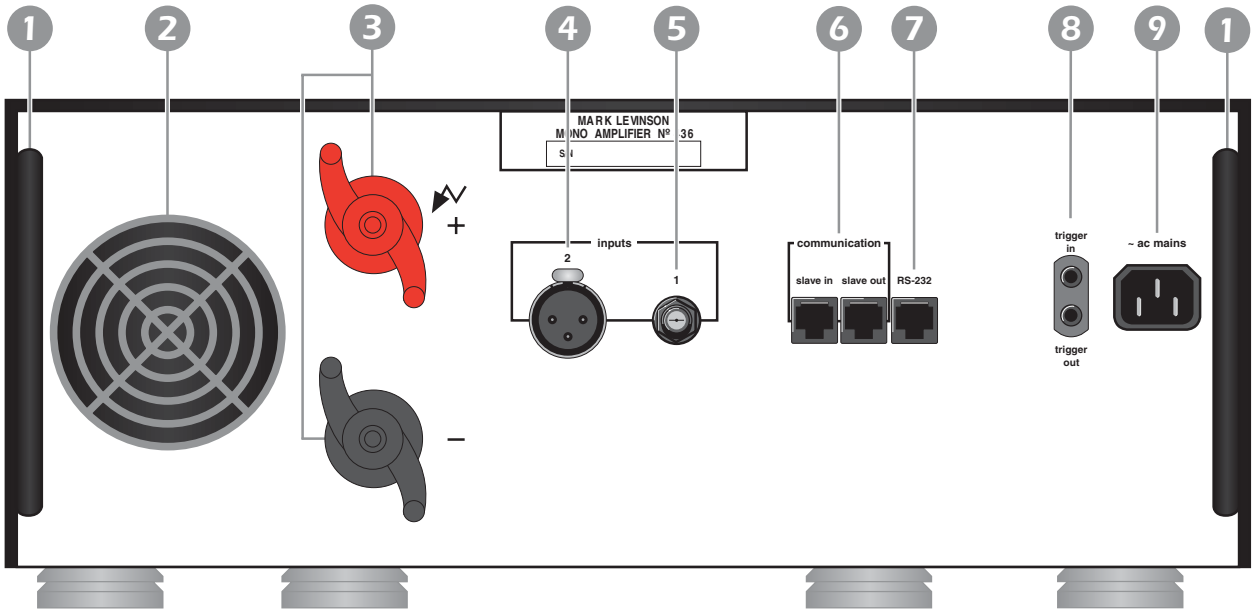
3. *indicator LED*

Indicates the ***operating state*** of the №436/434 and provides diagnostic information if a ***fault condition*** occurs. The table below describes all ***indicator LED*** behaviors.

See *"Extensive Protection"* for additional information about ***fault conditions***. If the №436/434 will not power on at all (even to ***sleep mode***), examine ***~ac mains*** connections or have an authorized Mark Levinson dealer inspect the internal fuses ***(which are not user-serviceable)***.

LED Behavior	***Description***
Fully lit	Indicates that power is connected to the №436/434 ***(on)***.
Slowly blinking	Indicates that the №436/434 is in ***standby***.
Dimly lit	Indicates that the №436/434 is in ***sleep mode***.
Unlit	Indicates that power is disconnected from the №436/434 ***(off)***.
Rapidly blinking ***(lit for longer intervals)***	Indicates that a ***power-related fault*** has occurred.
Rapidly blinking ***(lit/unlit for equal intervals)***	Indicates that a ***signal-related fault**** has occurred.
Rapidly blinking ***(unlit for longer intervals)***	Indicates that a ***thermal-related fault*** has occurred.

* ***Signal-related faults*** *include significant DC offsets at the output due to either DC in the input signal or a failed component within the amplifier OR excessive current demands due to a short-circuited loudspeaker wire.*



Rear Panel

The numbers in the rear panel illustration shown above correspond with the numbered items in this section.

Caution!

Never make or break connections to the N°436/434 unless it and all associated components are powered off and disconnected from electrical outlets. Before making connections to the N°436/434, make sure the associated preamplifier master volume is set to a reasonable level.

1. *rear panel handles*

Allow for safe, convenient lifting and moving of the Nº436/434. Refer to *"Unpacking"* for additional information.

Caution!

***DO NOT* attempt to lift the N°436/434 from its packing carton alone.**

***DO NOT* attempt to lift the N°436/434 while bending at the waist. When lifting, stand as straight as possible using the leg muscles to lift.**

Rear Panel (continued)

2. fan outlet

Provides an outlet for active, fan-driven cooling. A 1/4-inch (6.4mm) inlet between the front panel and the chassis provides air intake for the forced-air cooling system. See *"Ventilation"* for additional information.

3. *loudspeaker binding posts (main outputs)*

Provide audio output. Two custom-made, gold-plated, high-current ***binding posts*** labeled ***+ (positive)*** and ***– (negative)*** are available. In general, ***positive*** binding posts are red and ***negative*** binding posts are black.

Caution!

NEVER connect power amplifier outputs to any component other than a loudspeaker.

NEVER short-circuit power amplifier outputs.

NEVER connect power amplifier outputs to another power amplifier's outputs.

For best performance, use high-quality loudspeaker cables. To connect these cables, use a high-quality spade or hook lug soldered to the cable or crimped to the cable with extremely high pressure.

- Connect the ***+ (positive) binding post*** on the №436/434 to positive input on the associated loudspeaker.
- Connect the ***– (negative) binding post*** on the №436/434 to negative input on the associated loudspeaker.

Spade Lug

Hook Lug

Caution!

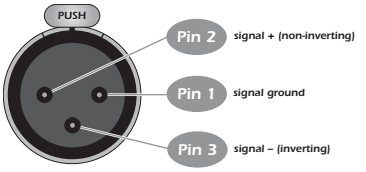
DO NOT OVER-TIGHTEN ***the Nº436/434 binding posts. The innovative design of these binding posts provides more leverage than more traditional designs. Tight, high-contact pressure connections can be achieved with finger-tightening. Special tools are not needed.***

DO NOT FORCE ***the Nº436/434 binding post "wings" up and over a bent or oversized connector. Doing so may result in binding post damage. If the connector obstructs "wing"-turning, slide it into place when the binding post opening provides a snug fit. Then, use quarter-turns to tighten the connection as needed.***

4. *balanced input connector*

Provides balanced audio input. One ***female XLR*** connector is available to accept ***balanced input*** signals from an associated preamplifier.

Balanced Input Connector



For best performance, use ***balanced connections*** whenever possible. Refer to the illustration shown to the left and to the associated preamplifier documentation to ensure that Nº436/434 XLR input pin assignments correspond to the associated preamplifier XLR output pin assignments. If not, wire the cable so that the appropriate input pin connects to the appropriate output pin.

Note

When the Nº436/434 is shipped, ***shorting-straps*** *are installed between pins 1 and 3 of the* ***balanced input*** *connector. These* ***shorting-straps*** *must be* ***REMOVED*** *when* ***balanced connections*** *are made. These* ***shorting-straps*** *must be* ***INSTALLED*** *when* ***unbalanced connections*** *are made. Installing the* ***shorting-straps*** *reduces the chance of noise at the (otherwise un-terminated) inverting* ***balanced input*** *connector.*

5. *unbalanced input connector*

Provides unbalanced audio input. One ***RCA*** connector is available to accept ***unbalanced input*** signals from an associated preamplifier. These signals are converted to balanced signals upon receipt, and processed as balanced signals thereafter. If the associated preamplifier does not support ***balanced connections***, connect the RCA output on the preamplifier to the ***RCA*** connector on the Nº436/434.

Rear Panel (continued)

6. Link communication ports

Provide "links" to compatible Mark Levinson preamplifiers and power amplifiers, allowing the Nº436/434 to share **Link controls** with these components. Two 6-pin modular RJ-11 jacks labeled ***slave in*** and ***slave out*** are available.

The ***slave in*** communication port can be connected to a compatible Mark Levinson preamplifier or power amplifier, and the ***slave out*** communication port can be connected to a compatible Mark Levinson power amplifier.

Note

*Refer to "Linking" **BEFORE** linking the Nº436/434 to other Mark Levinson components.*

7. RS-232 port

Provides serial control. One connector labeled **RS-232** is available.

8. trigger input & output connectors

Provide DC trigger control. One 1/8-inch mini-jack labeled ***trigger in*** is available to receive 12 or 5V DC signals from a connected component, and one 1/8-inch mini-jack labeled ***trigger out*** is available to pass these signals along to a connected power amplifier. The illustration to the left shows tip polarity requirements.

Mini-plug Tip Polarity

5 to 12V, positive tip polarity

Connect the ***trigger input*** connector on the Nº436/434 to the trigger output connector on a compatible component. Toggling the connected component between on and ***standby*** will toggle the Nº436/434 between on and ***standby***.

Connect the ***trigger output*** connector on the Nº436/434 to the trigger input connector on a compatible power amplifier. The Nº436/434 will pass incoming ***trigger signals*** along to the connected power amplifier, creating a "daisy-chain" of trigger control.

9. ~ac mains connector

Provides power to the N°436/434 through the supplied power cord when the supplied power cord is connected to the **~ac mains** connector and an electrical outlet. One IEC-standard AC mains receptacle labeled **~ac mains** is available.

Note

Before operating the N°436/434, make sure the **~ac mains** connector label indicates the correct **operating voltage** for the current location.

Warning!

The N°436/434 has been safety-tested and designed for operation with a three-conductor power cord. Do not defeat the "third pin" or "earth ground" of the power cord.

The N°436/434 includes internal fuses as a final stage of protection. The protection circuitry is designed so that only a catastrophic failure will cause these fuses to blow. If this occurs, disconnect the **power cord** from the N°436/434 **~ac mains** connector and the electrical outlet. Then, contact an authorized Mark Levinson dealer for assistance. **DO NOT attempt to replace the fuse. There are no user-serviceable parts within the N°436/434.**

Warning!

Potentially dangerous voltages and current capabilities exist within the N°436/434, even when power is disconnected. DO NOT attempt to open the power amplifier's chassis. There are no user-serviceable parts inside the power amplifier. Refer all servicing to an authorized Mark Levinson dealer.

Linking

Linking is available for all Mark Levinson components with **Link** or **Link2™ communication ports**, including **master**, **slave in**, and **slave out** communication ports. These communication ports "link" compatible Mark Levinson components in a slave chain, allowing them to share **Link controls**.

The №436/434 offers two **Link communication ports** labeled **slave in** and **slave out**. The **slave in** communication port can be connected to a compatible Mark Levinson preamplifier or power amplifier, and the **slave out** communication port can be connected to a compatible Mark Levinson power amplifier.

The №436/434 can be connected to:

- №30 Series preamplifiers, including the №32, №38, and №38S.
- №300 Series preamplifiers, including the №320S, №326S, №380, and №380S.
- №400 Series power amplifiers, including the №431 and №432.
- №39 and №390S CD Processors.
- Refer to the appropriate owner's manual for Link compatibility information about other Mark Levinson components.

Link Connections

- **DO** use **Link** or **Link2™ communication ports**, such as **master**, **slave in**, and **slave out** communication ports. **DO NOT** use RS-232 ports or other rear panel connectors.
- **DO** use Link communication cables, which are available at authorized Mark Levinson dealers.
- **DO** use constructed Link communication cables. See *"Constructing Link Communication Cables"* for additional information.

Caution!

Link connections must be made using Link communication ports and Link communication cables. Connections made using other connectors or cables may damage the N°436/434 and other linked components, possibly voiding the manufacturer's warranty and/or standard repair policies.

Constructing Link Communication Cables

Link communication cables can be constructed using an 8-conductor modular telephone cable with the appropriate plug crimped on each end.

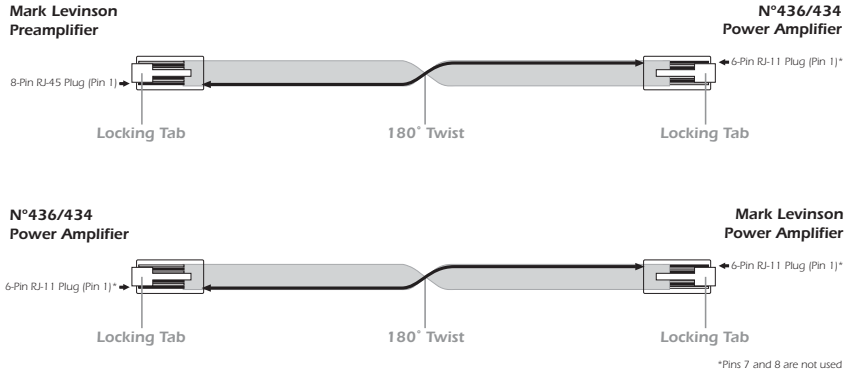
- Use an 8-pin RJ-45 plug when connecting to a preamplifier. RJ-45 plugs provide an 8-pin connection.
- Use a 6-pin RJ-11 plug when connecting to the Nº436/434 or another power amplifier. RJ-11 plugs provide a 6-pin connection in which connector pins 7 and 8 are not used.

Note

BEFORE making Link connections, refer to the appropriate owner's manual for **Link** or **Link2™ communication port** specifications for other Mark Levinson components.

When linking components with constructed Link communication cables, twist the cable 180˚ as shown in the illustration below for a straight-through (pin 1-to-pin 1) connection.

Constructed Link Cables



Creating a Slave Chain

Making Link connections creates a ***slave chain*** that facilitates communication among linked components, allowing them to share ***Link controls***.

Slave chains that include the Nº436/434 must include:

- ***Compatible Mark Levinson components.*** The Nº436/434 is compatible with the components listed on the previous page. Refer to the appropriate documentation for Link compatibility information about other Mark Levinson components.
- Components connected in a certain order to prevent communication from terminating. Power amplifiers such as the Nº436/434 must be the last component in a ***slave chain***.

Creating a Slave Chain (continued)

Note

*The **slave chains** in this section include preamplifiers and power amplifiers. However, **slave chains** can also include digital audio processors and digital transports. Refer to the appropriate owner's manual for information about including these Mark Levinson components in a **slave chain**.*

The table below indicates ***slave chain*** requirements for preamplifiers and power amplifiers.

Component	Slave Chain Requirements
Preamplifier **(e.g., N°320S)**	• No maximum number per ***slave chain***. • Connect the ***slave out*** communication port on the preamplifier to the ***slave in*** communication port on the first power amplifier.
Power Amplifier **(e.g., N°436/434)**	• Maximum of six per ***slave chain***. • Connect the ***slave in*** communication port on the first power amplifier to the ***slave out*** communication port on the preamplifier. • Connect up to six power amplifiers in a "daisy chain" using ***slave in-to-slave out*** communication port connections. The ***slave out*** communication port on the last power amplifier is not connected.

Note

*The Nº39 and Nº390S CD Processors can serve as either a digital audio processor or a digital transport in a **slave chain**.*

Note

Link *and* ***Link2™ communication port*** *names differ among Mark Levinson components. On some Mark Levinson power amplifiers, the **slave in** communication port is labeled **Link2™ input** and the **slave out** communication port is labeled **Link2™ control**. Refer to the appropriate owner's manual for **Link** and **Link2™ communication port** names for specific Mark Levinson components.*

To create a slave chain that includes the Nº436/434:

1. Make sure the Nº436/434 and all associated components are powered **off**.

2. Connect the ***slave in*** communication port on the first power amplifier to the ***slave out*** communication port on the preamplifier.

Sample Slave Chain

N°320S
Preamplifier
Step A:
Connect the Link2 **(slave out)** communication port on the preamplifier to the **slave in** communication port on the first power amplifier.

N°436
Power Amplifier
Step B:
Connect the **slave out** communication port on the first power amplifier to the **slave in** communication port on the second power amplifier.

N°434
Power Amplifier
Step C:
Connect the **slave out** communication port on the second power amplifier to the **slave in** communication port on a third power amplifier. This step can be repeated to include up to six power amplifiers in the **slave chain**.

If no additional power amplifiers are included in the **slave chain**, the last power amplifier **slave out** communication port is not connected.

If desired, connect the ***slave out*** communication port on the first power amplifier to the ***slave in*** communication port on another power amplifier. Up to six power amplifiers can be included in a ***slave chain*** using "daisy chain" ***slave in-to-slave out*** communication port connections. The ***slave out*** communication port on the last power amplifier is not connected.

Refer to the table on the previous page and to the illustration to the left for additional assistance.

3. When Link connections have been made, power on linked components ***ONE AT A TIME*** in the order specified below. Allow each component to complete its initialization sequence before proceeding to the next component.

   A. Digital Audio Processor

   B. Digital Transports

   C. Preamplifier

   D. Power Amplifiers (begin with the first power amplifier in the slave chain)

At this point, the front panel ***standby LEDs*** on all linked components should be blinking in unison.

Note

To ensure proper functioning of ***Link controls****, linked components must be powered on* ***ONE AT A TIME*** *in the following order: digital transport(s), then digital audio processor, then preamplifier, then power amplifier(s).* ***DO NOT*** *use a power strip switch to power on several components at once. When power is supplied to a power strip, power is automatically supplied to connected components without a power button.*

4. Take the linked preamplifier out of ***standby***.

   - All linked power amplifiers should come out of ***standby*** as well. If this does not occur, repeat steps 3 and 4. If problems persist, contact your authorized Mark Levinson dealer.

Link Controls

Linking Mark Levinson components allows them to share ***Link controls***. The table below provides a general description of controls the Nº436/434 shares with linked preamplifiers and power amplifiers. Some controls may not be available for certain component combinations. Other Mark Levinson components may share additional controls. Refer to the appropriate Mark Levinson owner's manual for additional information.

Note the following:

- To ensure proper functioning of ***Link controls***, linked components must be powered on ***ONE AT A TIME*** in the following order: digital audio processor, then digital transport(s), then preamplifier, then power amplifier(s).
- ***Link controls*** must be enabled on each linked digital transport's linking menu, which allows activation and deactivation of individual ***Link controls***. Refer to the appropriate Mark Levinson owner's manual for additional information.
- Some Mark Levinson digital transports accommodate a maximum of four front panel display characters. In these cases, certain ***input names*** appear abbreviated on the front panel display. For example, an input named No320S will appear as No32 on the digital transport front panel display even though the input is associated with the Nº320S.
- The linked preamplifier and power amplifier(s) must be in the same ***standby-state*** to allow linked power amplifier(s) to enter ***standby*** after a power failure.

Component / Link Control	Preamplifier	Power Amplifier(s)
Standby Link	• Placing the linked preamplifier into ***standby*** places all linked power amplifiers into ***standby***. • Taking the linked preamplifier out of ***standby*** takes all linked power amplifiers out of ***standby***.	• Placing a linked power amplifier into ***standby*** places all other linked power amplifiers into ***standby***. • Taking a linked power amplifier out of ***standby*** takes all other linked power amplifiers out of ***standby***.
Fault Condition Link	• If a linked power amplifier experiences a ***fault condition***, it reports the ***fault condition*** to the linked preamplifier. The power amplifier's number and ***fault condition*** code appear on the preamplifier's front panel display. • The power amplifier number refers to its position in the ***slave chain***. For example, ***AMP1*** refers to the first power amplifier in the ***slave chain***. • Power amplifier ***fault condition*** codes are listed below. See *"Extensive Protection"* for additional information. – ***HOT!*** indicates a ***thermal-related fault*** condition. – ***DCO!*** indicates a ***signal-related fault*** such as an uncorrectable DC offset.	

Troubleshooting

Incorrect operation is sometimes mistaken for malfunction. If problems occur, refer to this section for troubleshooting information. If problems persist, contact your authorized Mark Levinson dealer.

1. No audio and the indicator LED is not lit.

- Examine **~ac mains** connections to ensure the **power cord** is connected to the **~ac mains** connector and an electrical outlet.
- Make sure the Nº436/434 is powered on using the **power button**.
- Examine the electrical circuit breaker to ensure that power is supplied to the electrical outlet to which the Nº436/434 is connected.
- A power loss or power outage may have occurred. In this case, power cycle the Nº436/434 using the **power button**, waiting at least 10 seconds between powering the Nº436/434 **off** and **on**.
- A fuse may be blown inside the Nº436/434. In this case, disconnect the power cord from the **~ac mains** connector and the electrical outlet. Then, contact an authorized Mark Levinson dealer. **DO NOT attempt to replace the fuse. There are no user-serviceable parts within the N°436/434.**

Warning!

Potentially dangerous voltages and current capabilities exist within the N°436/434, even when power is disconnected. DO NOT attempt to open the power amplifier's chassis. There are no user-serviceable parts inside the power amplifier. Refer all servicing to an authorized Mark Levinson dealer.

Troubleshooting (continued)

2. ***No audio and the indicator LED is dimly lit.***

   - The Nº436/434 is in ***sleep mode***. To take it out of ***sleep mode***, press the ***standby button***. The Nº436/434 will enter ***standby***.
   - A power loss or power outage may have occurred. In this case, power cycle the Nº436/434 using the ***power button***, waiting at least 10 seconds between powering the Nº436/434 ***off*** and ***on***.

3. ***No audio and the indicator LED is slowly blinking.***

   - The Nº436/434 is in ***standby***. To take it out of ***standby***, press the ***standby button***. The Nº436/434 will power on.

4. ***No audio and the indicator LED is rapidly blinking, remaining lit for longer intervals.***

   - Examine ***~ac mains*** connections to ensure the ***power cord*** is connected to the ***~ac mains*** connector and an electrical outlet.
   - Power cycle the Nº436/434 using the ***power button***, waiting at least 10 seconds between powering the Nº436/434 ***off*** and ***on***.
   - Contact an authorized Mark Levinson dealer.

5. ***No audio and the indicator LED is rapidly blinking, remaining lit and unlit for equal intervals.***

   - A ***signal-related fault*** is present, probably either a DC offset or an over-current condition. If this occurs:
     a. Power the Nº436/434 ***off*** using the ***power button***.
     b. Disconnect the input signal and loudspeaker wires.
     c. Wait 10 seconds.
     d. Power the Nº436/434 ***on*** using the ***power button***.

     If the Nº436/434 powers on, repeat these steps, reconnecting input signal and loudspeaker wires one at a time to determine what is causing the ***fault***. ***Remember to power the N°436/434 off using the power button before making or breaking connections.*** If the Nº436/434 does not power on, there is an internal failure. Contact an authorized Mark Levinson dealer.

6. *No audio and the indicator LED is rapidly blinking, remaining unlit for longer intervals.*

- A ***thermal-related fault*** is present, which causes the Nº436/434 to enter ***sleep mode***. Once the heat sinks have cooled below 85°C (158˚F or 358K), the Nº436/434 can be taken out of ***sleep mode*** using the ***standby button***.

7. *No audio and the indicator LED is lit at full brightness.*

- The Nº436/434 is powered on, but is not passing a signal. Examine signal cables to ensure a solid connection between the Nº436/434 and the associated preamplifier and loudspeakers.

8. *The N°436/434 keeps powering off.*

- A ***signal-related fault*** may be present at the input (e.g., a DC signal from the preamplifier) or the output (e.g., short-circuited loudspeaker wires). If this occurs:
  a. Power the Nº436/434 ***off*** using the ***power button***.
  b. Disconnect the input signal and loudspeaker wires.
  c. Wait 10 seconds.
  d. Power the Nº436/434 ***on*** using the ***power button***.

  If the Nº436/434 powers on without entering ***standby*** or ***sleep mode***, a ***fault*** is present at the input or the output. To isolate the problem:
  a. Power the Nº436/434 ***off*** using the ***power button***.
  b. Reconnect the loudspeaker wires.
  c. Power the Nº436/434 ***on*** using the ***power button***.

  If the Nº436/434 powers on into ***standby*** or ***sleep mode***, the ***fault*** is present at the output. If not, the ***fault*** is present at the input.

9. *If all else fails...*

- Power cycle the Nº436/434 using the ***power button***, waiting at least 10 seconds between powering the Nº436/434 ***off*** and ***on***.
- Contact an authorized Mark Levinson dealer.
- Contact Mark Levinson Customer Service at 781-280-0300 or www.marklevinson.com.

Care & Maintenance

The Nº436/434 requires routine care and maintenance to ensure optimal performance. The bulleted items included in this section indicate maintenance procedures that should be performed on a regular basis.

Note

Failure to perform the maintenance procedures included in this section may void the manufacturer's warranty and/or standard repair policies.

- Use a feather duster or a low-pressure blower to remove dust from the Nº436/434 exterior surface.
- Use a soft, lint-free cloth to remove dirt and fingerprints from the Nº436/434 exterior surface. **DO NOT** use a cloth made with steel wool or metal polish.
  - If needed, this cloth can be dampened with isopropyl alcohol. **DO NOT** dampen the cloth with Benzene, acetone-based cleaners, and other commercial cleaners.
  - Wipe the Nº436/434 exterior surface in the same direction as the grain of the brushed aluminum.

Caution!

***DO NOT** apply liquid directly to the Nº436/434 exterior surface. Doing so may damage electrical components.*

- Refer to *"Installation Considerations"* for information about preventative maintenance.

Specifications

N°436 rated power output:
- 350 w/ch rms power @ 8Ω
- 700 w/ch rms power @ 4Ω

N°434 rated power output:
- 125 w/ch rms power @ 8Ω
- 250 w/ch rms power @ 4Ω

All power ratings from 20Hz to 20kHz @ <0.5% THD (assuming that the AC mains can deliver adequate current without its own voltage sagging).

Frequency response:
- 20Hz to 20kHz (±0.3dB)

Signal-to-noise ratio:
- better than –80dB, (ref. 2.83V)

Input impedance:
- 100kΩ (balanced)
- 50kΩ (unbalanced)

Voltage gain:
- 26.8dB

Input sensitivity:
- 2.83V output: 130mV for both models
- full output: 2.419V for Nº436
- full output: 1.445V for Nº434

N°436 power consumption:
- 525W (±5%) on
- 100W (±5%) standby

N°434 power consumption:
- 275W (±5%) on
- 100W (±5%) in standby

AC mains voltage:
- preset (determined by needs of country for which product was manufactured)

All specifications are subject to change without notice.

Specifications (continued)

Overall dimensions:
- See *"Dimensions, Nº436"* and *"Dimensions, Nº434"*

N°436 weight:
- shipping: 95 pounds (43.2kg)
- net: 85 pounds (38.6kg)

N°434 weight:
- shipping: 65 pounds (29.5kg)
- net: 56 pounds (25.5kg)

Connector complement:
- 2 custom-designed loudspeaker binding posts
- 1 balanced input connector (female XLR)
- 1 unbalanced input connector (RCA)
- 2 1/8-inch (3.5mm) mini-jacks for trigger control
- 1 RS-232 port (RJ-11)
- 2 Mark Levinson Link communication ports (RJ-45)
- 1 IEC-standard AC mains receptacle

Output impedance:
- <0.05Ω (20 to 20,000Hz)

All specifications are subject to change without notice.

Declaration of Conformity

Application of Council Directive(s):

89/336/EEC and 73/23/EEC, as amended.

Standard(s) to which Conformity is Declared:

- EN 55013:2001
- EN 55020:2002
- EN 60065:1998
- EN 61000-3-3:2001

Manufacturer:

Harman Specialty Group
3 Oak Park
Bedford, MA 01730-1413 USA

The equipment identified here conforms to the Directive(s) and Standard(s) specified above.

Type of Equipment:

Power Amplifiers

Models:

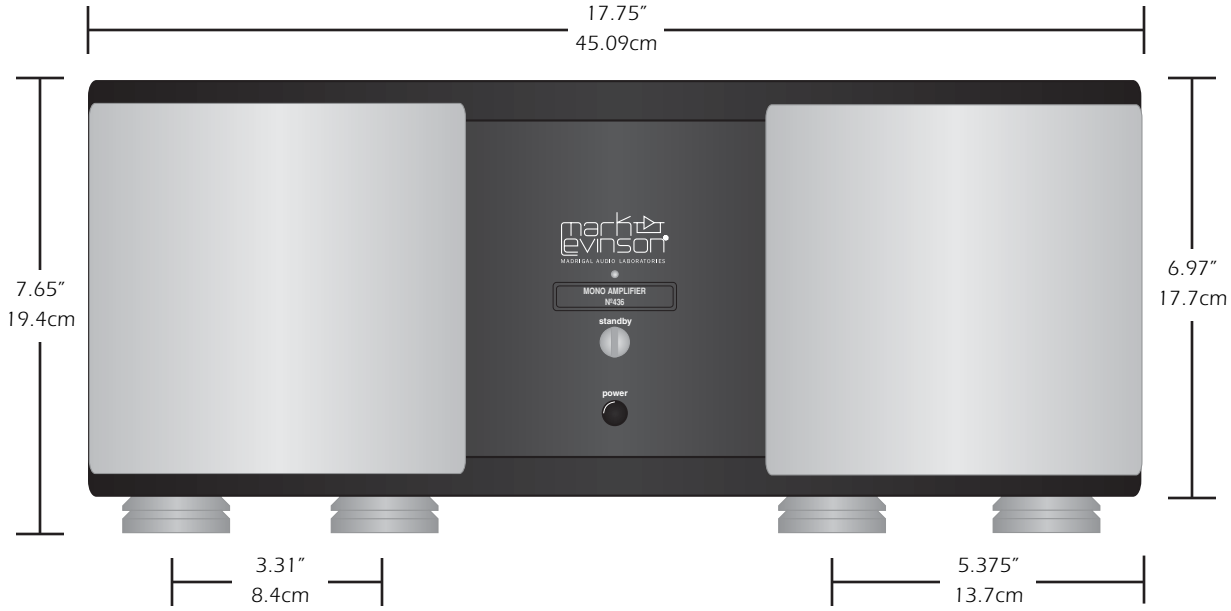
Mark Levinson Nº436 and Nº434

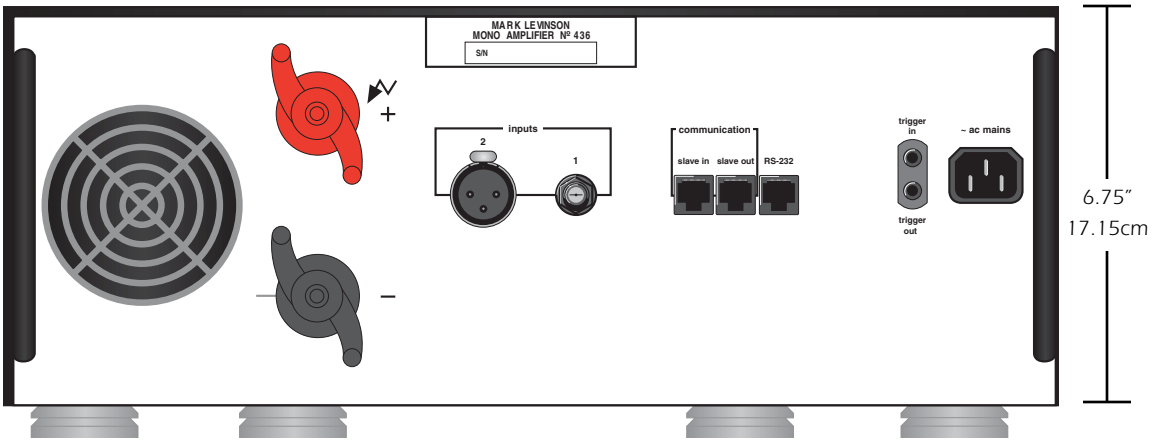
Date:

July 2004

Harman Specialty Group
Vice President of Engineering
3 Oak Park
Bedford, MA 01730-1413 USA
Telephone: 781-280-0300
Fax: 781-280-0490
www.marklevinson.com

Dimensions, N°436





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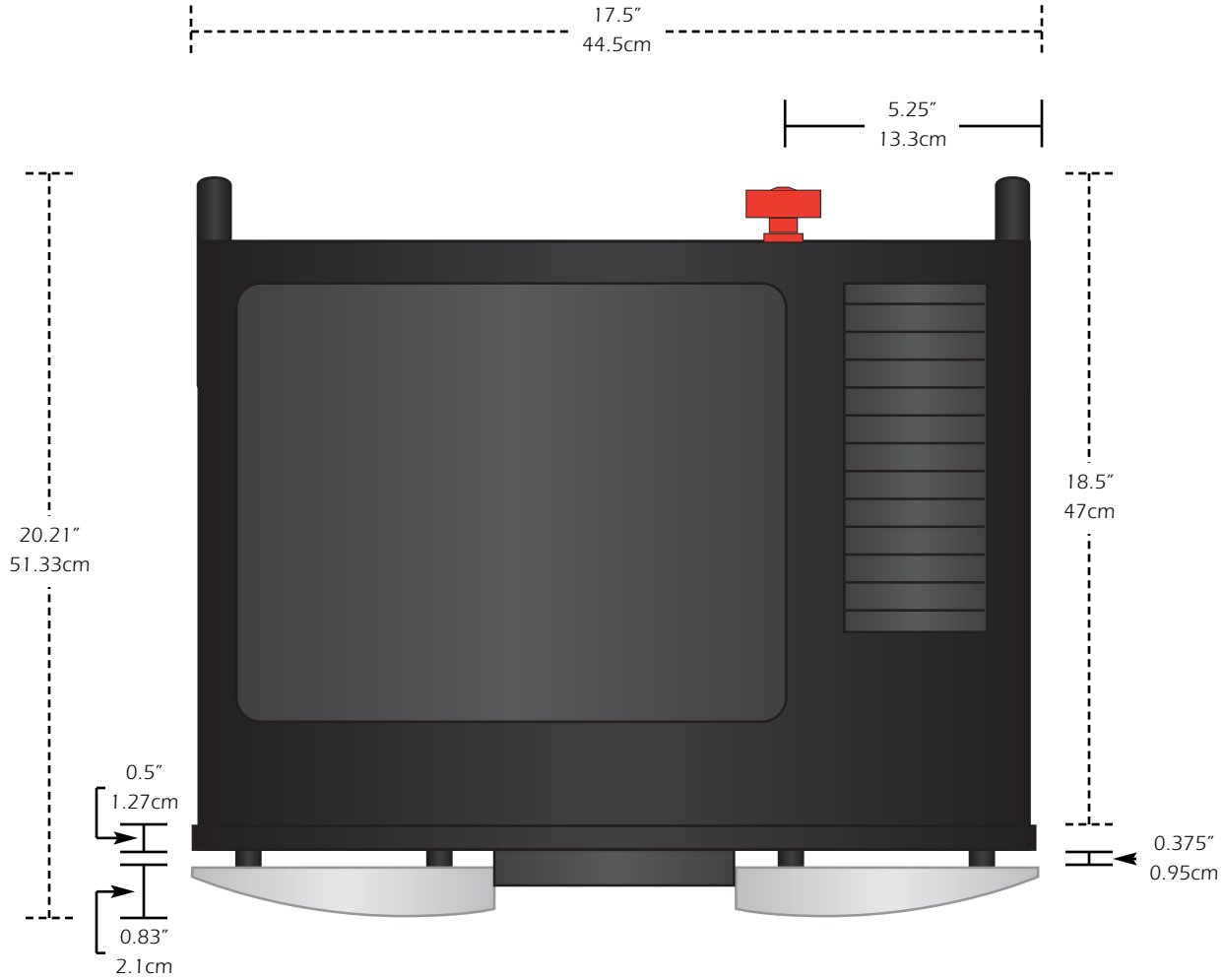

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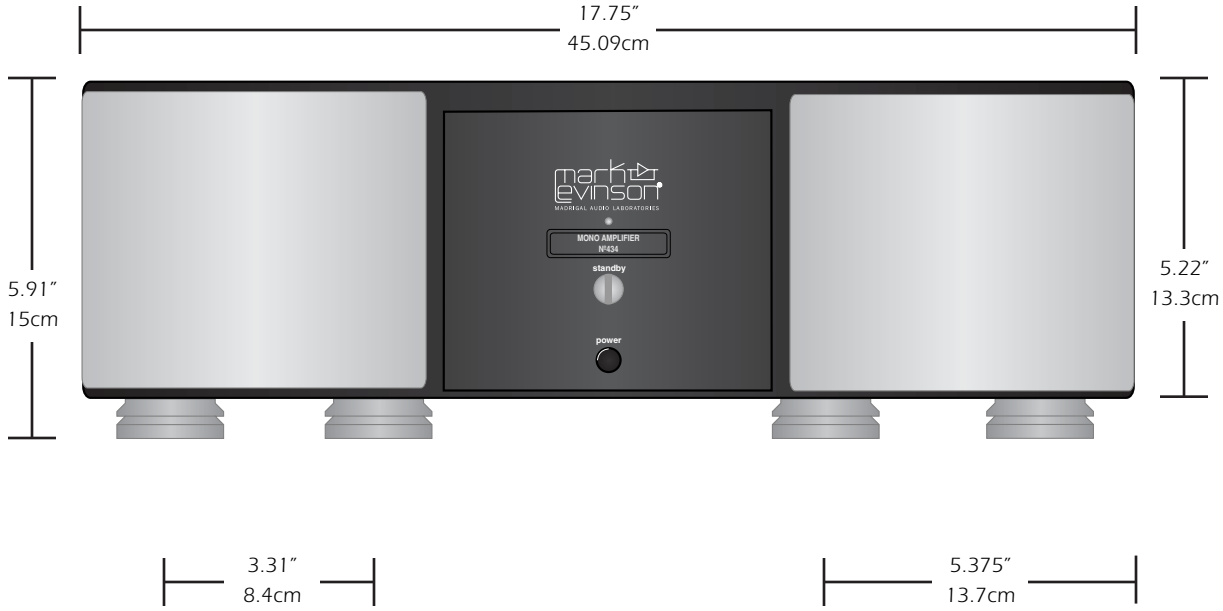
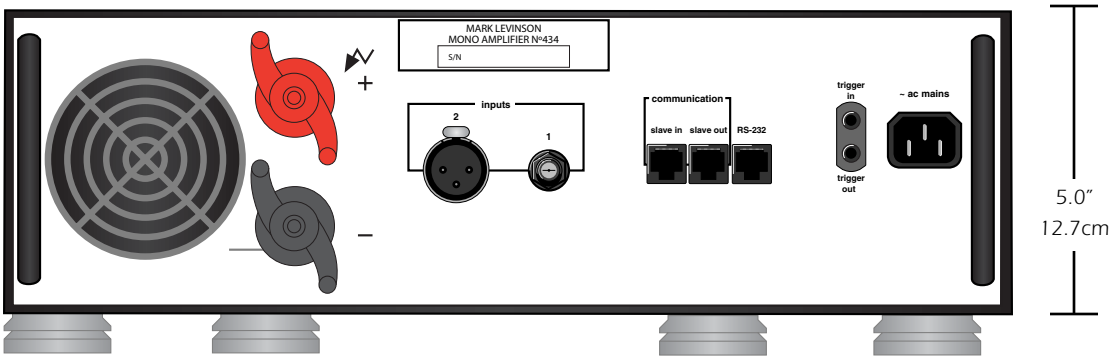
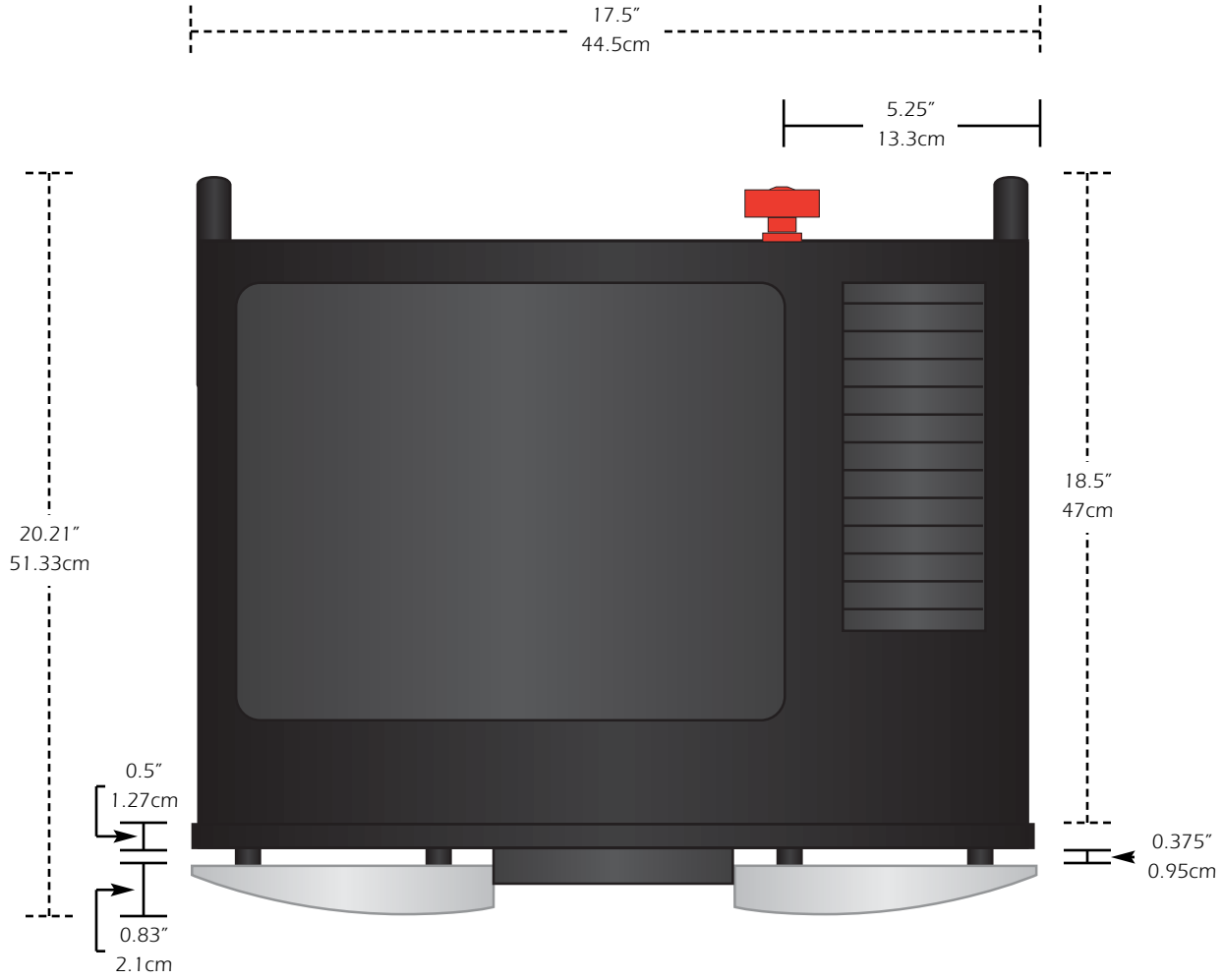
Dimensions, N°434





" indicates inches



" indicates inches

3 Oak Park, Bedford, MA, 01730-1413 USA | Telephone: 781-280-0300 | Fax: 781-280-0490 | www.marklevinson.com
Customer Service: Telephone: 781-280-0300 | Sales Fax: 781-280-0495 | Service Fax: 781-280-0499
Product Shipments: 16 Progress Road, Billerica, MA 01821-5730 USA

Part No. 070-630430 | Rev 6 | 07/04