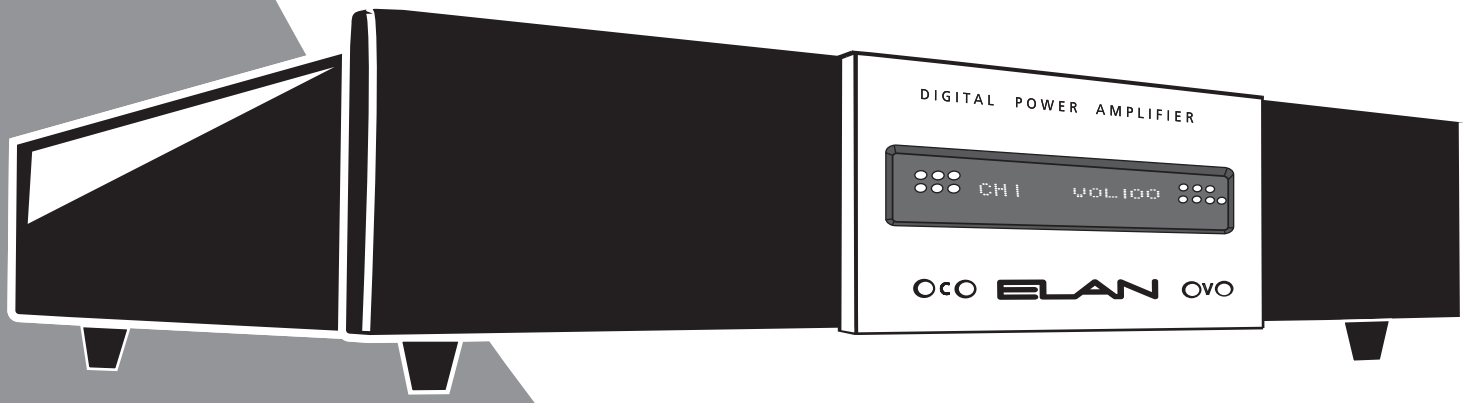
D SERIES

D400/D401

2 CHANNEL DIGITAL POWER AMPLIFIER

INSTALLATION MANUAL AND USER'S GUIDE



COMPACT, POWERFUL, & VERY COOL.

ELAN HOME SYSTEMS™

WARNING

RISK OF ELECTRIC SHOCK
DO NOT OPEN!

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instruction in the literature accompanying the appliance.

WARNING: TO REDUCE THE RISK OF FIRE OR SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

CAUTION

SOME DETACHABLE POWER CORD SOCKETS HAVE THIS FUSE SYMBOL WHICH INDICATES THERE IS A REPLACEABLE FUSE WITHIN THE SOCKET. FOR SAFETY PURPOSES REPLACE ONLY WITH SPECIFIED FUSE.

IMPORTANT SAFETY INFORMATION

Read Information—All the safety and operating information should be read before the appliance is operated.

Follow Information—All operating and use information should be followed.

Retain Information—The safety and operating information should be retained for future reference.

Heed Warnings—All warnings on the appliance and in the operating instructions should be heeded.

Wall Mounting—Mounting of this appliance should be done only by an authorized installer.

Ventilation—The appliances should be situated so that their location or position does not interfere with their proper ventilation. These appliances should never be placed near or over a radiator or heat register. These appliances should not be placed in a built-in installation such as a bookcase or cabinet that may impede the flow of air through the ventilation openings.

Non-Use Periods—Appliances that are left unattended and unused for long periods of time should be de-energized.

Power Sources—The appliances should be connected to a power supply only of the type described in the operating instructions or as marked on each appliance. If you are not sure of the type of power supply to your home, consult your authorized ELAN dealer or local power company.

Grounding or Polarization—Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one blade wider than the other blade. A grounding type plug has two blades and a third grounding prong. The polarized wide blade and the third prong are provided for your safety. If the provided plug does not fit your outlet, consult an electrician for replacement of the obsolete outlet.

WARNING
RISK OF ELECTRIC SHOCK
DO NOT OPEN

Water and Moisture—To reduce the risk of electric shock or fire, these appliances should not be used near water—for example, near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool.

Power Cord Protection—Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles and the point where they exit from the apparatus.

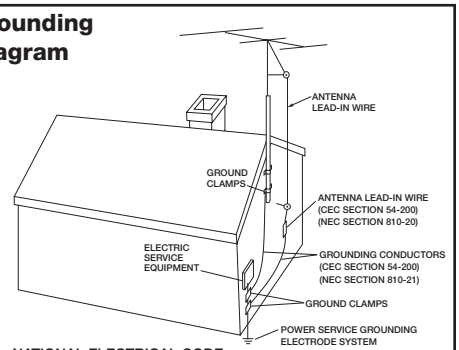
Telephones—Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electrical shock from lightning. Do not use a telephone to report a gas leak if the leak is in the vicinity of the ELAN electronic equipment because of risk of fire or explosion.

Cleaning—Unplug the apparatus from the power outlet before cleaning. Use only a dry cloth to clean the apparatus.

Power Lines—An outdoor antenna should be located away from power lines. When installing an outside antenna system, extreme care should be taken to avoid touching power lines or circuits, as contact with them may be fatal.

Outdoor Antenna Grounding—If an outside antenna or cable system is connected to these audio products, be sure the antenna or cable system is grounded so as to provide some protection against voltage surges and built-up static charges. Section 810 of the U.S. National Electrical Code, and Section 54 of the Canadian Electrical Code, provide information with respect to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding conductors, location of antenna-discharge unit, connection to grounding electrodes, and requirements for the grounding electrode. See the grounding diagram (right).

Grounding Diagram



NEC - NATIONAL ELECTRICAL CODE
CEC - CANADIAN ELECTRICAL CODE

Overloading—Do not overload wall outlets and extension cords, as this could result in fire or electric shock.

Object and Liquid Entry—Never insert objects of any kind through the openings of these appliances, as they may touch dangerous voltage points or short-out parts that could result in a fire or electric shock. Care should be taken so that objects do not fall and liquids are not spilled into the appliance through openings in the enclosure.

Servicing—Do not attempt to service these appliances yourself, as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.

Damage Requiring Service—These appliances should be serviced by qualified service personnel when:

- A power supply connection or a plug has been damaged or
- If liquid has been spilled into the appliance or objects have fallen into the appliance or
- The appliance has been exposed to water or moisture or
- The appliance does not appear to operate normally or exhibits a marked change in performance or
- The appliance has been dropped or the enclosure damaged.

Replacement Parts—When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer or that have the same characteristics as the original part. Unauthorized substitutions may result in fire, electric shock, or other hazards. The Master Control Unit battery should be replaced only after turning the power off and only by an authorized installer.

Safety Check—Upon completion of any service or repairs to this audio product, ask the service technician to perform safety checks to determine that the audio product is in proper operating condition.

Lightning Storms—Unplug this apparatus during lightning storms or when unused for long periods of time.

Attachments and Accessories—Use only attachments/accessories specified by the manufacturer.

Cart, Stand, Tripod, Bracket or Table—Use only with a 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 from tip over.

Disconnect Device—Where the mains plug or an appliance coupler is used as the disconnect device, the disconnect device shall remain operable.

Table of Contents

ELAN®
HOME SYSTEMS
2428 Palumbo Dr.
Lexington, KY USA 40509
Voice 859-269-7760
Tech Support 800-622-3526
www.elanhomesystems.com

1. Introduction

Thank You!

Thank you for purchasing this unique product. The ELAN D400 Digital Power Amplifier has been designed specifically for custom installers to provide a perfect solution for multi-room, whole-house applications. Two channels of clean, powerful audio can be loaded with multiple speakers to create a low-impedance, high power scenario; perfect when high volume is required. 'Class-T' Digital Technology and ACE™ (Automatic Clip Eliminator™) allow efficient use of power, ensuring clean, accurate audio at all volume levels in any application.

The ELAN Story

Located in Lexington, KY, USA, ELAN Home Systems has designed innovative multi-room audio/video systems since 1989. ELAN systems were the first to integrate music, intercom and TV distribution features that used the homeowner's stereos, telephones, and televisions to create the whole-house entertainment experience. These systems allow people to move from room to room, controlling centrally located equipment with ease

ELAN's product line includes:

- Power Amplifiers
- Multi-Room Controllers
- Intelligent Keypads
- LCD Color Touch Panels
- In-Wall and In-Ceiling Speakers
- Outdoor Speakers
- System Controllers
- Volume Controls
- Telephone-Based Intercom Controllers
- Video Switchers
- Digital Music Management Systems
- Accessories for Home Systems Installation

ELAN has introduced nearly 300 new products in the last eight years and has been honored with over 50 industry awards.

Safety Concerns

Use only grounded outlets when powering this product. Making any modification to the power cord could cause unsafe operation and will void the manufacturer's warranty.

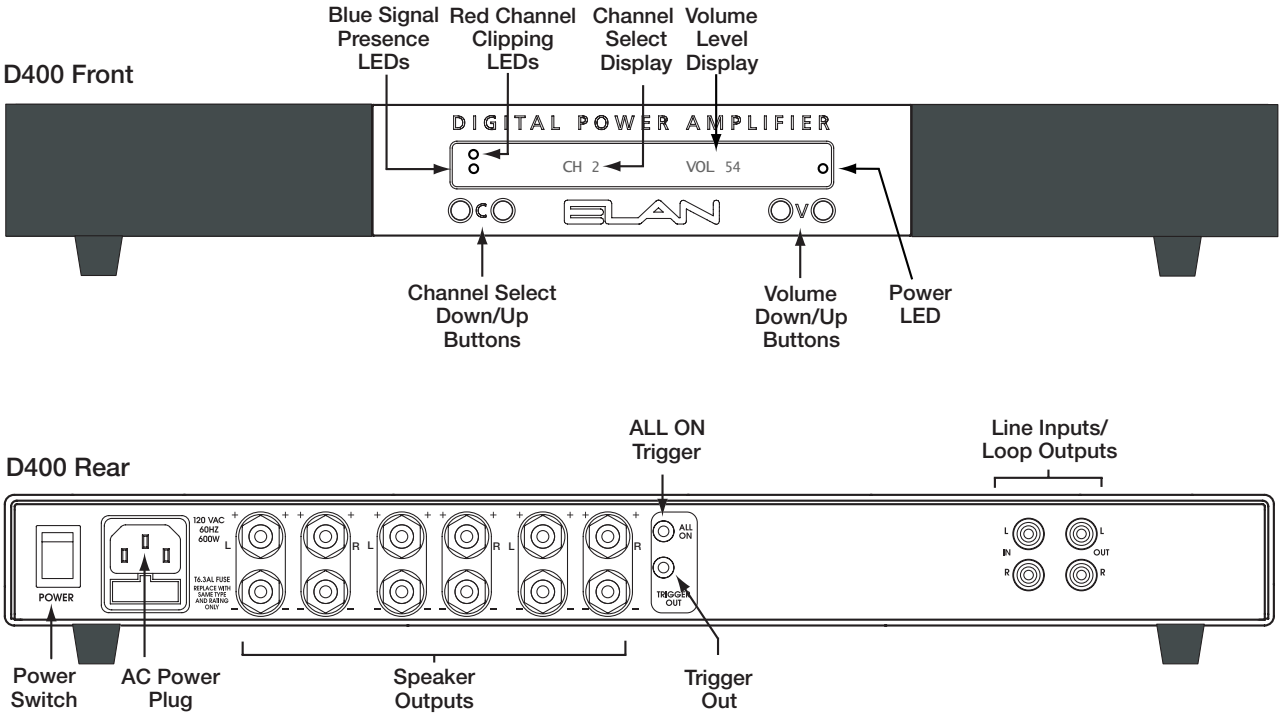
AC Power Considerations

The D400 requires 7 Amps of AC currect. When designing any whole house system using multi-channel amplifiers, make sure to provide adequate provisions for all electronic equipment to be installed. This may require additional outlets and/or circuit breakers to be installed. Consult a licensed electrician in this case.


ALL CONNECTIONS SHOULD BE MADE
WITH THE AMPLIFIER TURNED OFF
AND UNPLUGGED FROM POWER.
DAMAGE CAN OCCUR TO EQUIPMENT
IF IMPROPER CONNECTIONS ARE MADE!


THIS AMPLIFIER IS NOT BRIDGEABLE!
DO NOT TRY TO BRIDGE
OR COMBINE OUTPUTS!
DAMAGE TO THE AMP WILL OCCUR.

D400 Front/Rear



Specifications

Audio Section

Power Rating - RMS

Output Power . . . . . 2 x 80W RMS @ 8 Ohms (Both Channels Driven)
Output Power . . . . . 2 x 135W RMS @ 4 Ohms (Both Channels Driven)
Output Power . . . . . 2 x 200W RMS @ 2 Ohms (Both Channels Driven)

Frequency Response . . 20Hz to 20kHz, +/-.5dB into 8 Ohms
Full Power Bandwidth . . . . . 10Hz to 50kHz
Signal-To-Noise . . . . . > 102dB (A-weighted)
Channel Separation . . . >-70dB (channel to channel @1kHz)
Total Harmonic Distortion . . . . . < .01% @ 1kHz
< 0.04% @ 10kHz
Intermodulation Distortion . . . . . .< 0.1%
Voltage Gain (AV) . . . . . Continuously Variable from 0 - 27
Slew Rate . . . . . > 20V/microsecond
Input Impedance . . . . . 49k Ohms
Input Sensitivity . . . . . 0.9V RMS (150W @ 4 Ohms-Vol Max)

Connectors

Input/Loop Outputs . . . . . .Gold RCA Phono
Speaker Output . . . . . .Five-Way Binding Posts

Power

AC Power Requirements . . . . . 120 VAC, 750 Watts
Power Supply . . . . Ultra-High Efficiency Toroidal Transformer

Triggers

Remote Trigger Inputs . . . . . 5 to 24 Volts DC
Trigger Loop Output . . . . . +12VDC @0.1A

Dimensions/Weight

Dimensions. . . . . 17 x 1¾ x 15 (in)/43.18 x 4.46 x 38.10 (cm)
Rack Face . . . . . 19 X 1¾ (in)/48.26 x 4.46(cm)
Weight . . . . . 22 lbs/10 kg

Features

'Class-T' Design

'Class-T' Digital Technology allows the D400 to deliver its full rated power from both channels simultaneously and is 85% efficient so that the amplifier does not waste energy producing excessive heat.

ACE™ (Automatic Clip Eliminator)

Microprocessor-controlled dynamic leveling circuit eliminates clipping without audio degradation typical with traditional compressor-based clipping circuits. Each amplified output is continuously monitored for signal clipping. Extremely fast transients are ignored but if ACE sees a consistent clipping trend, it turns the respective channel down by one increment. This action is repeated until no more clipping is detected. Once clipping is absent for five seconds, ACE will slowly and unnoticeably begin to restore the original gain settings. This translates into accurate, high quality audio reproduction at all volume levels.

Vacuum Florescent Display

Blue Signal Presence LEDs show when audio is present on each input. Red Clipping LEDs indicate distortion, and make fine tuning the amplifier very straightforward. The Signal Level and Power LEDs feature adjustable brightness.

Digital Level Set/Lockout

All channel levels are matched to within 0.3dB, making setup easy, accurate, and repeatable. Level settings are stored within the D400's non-volatile memory upon exiting setup. This means that settings are preserved even when a power outage occurs.

A special multi-button key press can be used to lock the volume settings so that they can not be tampered with. The user may view their settings when the system is locked, but is unable to change them.

Advanced Amplifier Protection

Each channel of the D400 is coupled to its respective modular speaker terminal via a high-power relay. If the processing circuitry senses a fault condition (over heating, shorted output, etc.), it will completely disconnect the amplifier channel from the output load. Faulted conditions will be indicated on the front panel display. After powering down and finding and correcting the problem causing the fault condition, the D400 will resume normal operation upon power up.

Single Rack Height Design

The D400's single rack height design uses space very efficiently while still producing an abundance of power.

'Class-T' Digital Technology Explained

The ultimate objective of any audio amplifier design is to make a high fidelity amp with high efficiency and high reliability. There are several basic audio power amp topologies that have been developed to attain these objectives: **Class-A**, **Class-B**, **Class-AB**, **Class-H**, **Class-G** and **Class-D** are the most common. The D400 utilizes proprietary **Class-T** topology from Tripath™. **Class-T** combines the best attributes of several of these designs and minimizes deficiencies in each design, as well.

Class-A, **Class-B** and **Class-AB** amps have been around for over fifty years. Basically, these classifications designate the amount of time that the amp's output devices conduct during one full cycle of a periodic signal. Class-A amps are in a state of conduction 100% of the time. Class-B amps have a complimentary pair of outputs, which are biased so that each output is conducting only 50% of the time. Class-AB amps also have complimentary output pairs but they are biased so that each output is conducting slightly more than 50% of the time: this lowers crossover distortion. The vast majority of audio amps in use today are Class-AB. A well-designed Class-AB amplifier has good linearity (high fidelity) and poor efficiency (less than 50%). **Class-H** and **Class-G** are both voltage-supply varying techniques which are usually applied to Class-AB type, linear amplifiers. These techniques give marginal improvement in efficiency at the cost of a more complex and less reliable power supply.

Class-D amplifiers use output devices which switch on and off at a fixed frequency. This frequency is usually more than ten times higher than the highest frequency to be amplified. A passive filter reconstructs the wave form passing through the amplifier and removes switching artifacts that distort sound. Class-D amplifiers use output devices that are either ON or OFF; never in a state of mid-conduction. This mid-conduction state is what causes linear switching amplifiers to be as inefficient as they are (less than 50% efficiency). Class-D amplifiers are approximately 85% efficient: a 35% increase!

As mentioned, each of these amplifier designs has drawbacks. Class-D amps have tendencies toward high distortion rates. Crossover distortion, ground bounce, and high frequency artifacts create most of the distortion in these designs. Imperfectly matched transistors lead to inexact ON/OFF timing results and crossover distortion issues. Ground Bounce caused by high-current switching of the output transistors manifests itself as noise on the audio output. In some Class-D amplifiers, this high-frequency noise is not completely filtered out, resulting in high frequency distortion.

Advantages of Class-T Design

Class-T is a combination of Adaptive Digital Signal Processing and Spread-Spectrum Switching. This design takes the efficiency of a Class D amp and combines it with the fidelity of a Class AB amplifier by dramatically improving signal integrity.

Class-T offers the following improvements over Class-D:

1. Class-D has a fixed output switching frequency. Class-T has an adaptive switching frequency which is dependent upon both input signal frequency and magnitude. Switching artifacts are removed in this way, reducing distortion. The switching signal is constantly being optimized to match the input signal in order to yield the highest possible fidelity.

2. Class-D amplifiers have nominal switching frequencies between 200kHz and 300kHz which creates artifacts in the 20 to 50kHz audio band. This can be heard as audible noise. Class-T amplifiers have nominal switching frequencies between 600kHz and 700kHz; artifacts from this frequency are not audible.

3. Class-T design constantly monitors the output transistors and adaptively corrects for variations between and within these transistors. The Class-T design also monitors and corrects for ground bounce that the transistors produce when switching large currents.

4. Typical power efficiency with a Class-T amplifier is 85% (unreachable by Class-AB amps).Typical THD + Noise is less than 0.04% (unreachable by Class-D amps.) Truly the best of both worlds!

2. Connections & Applications

Multi-Speaker Applications

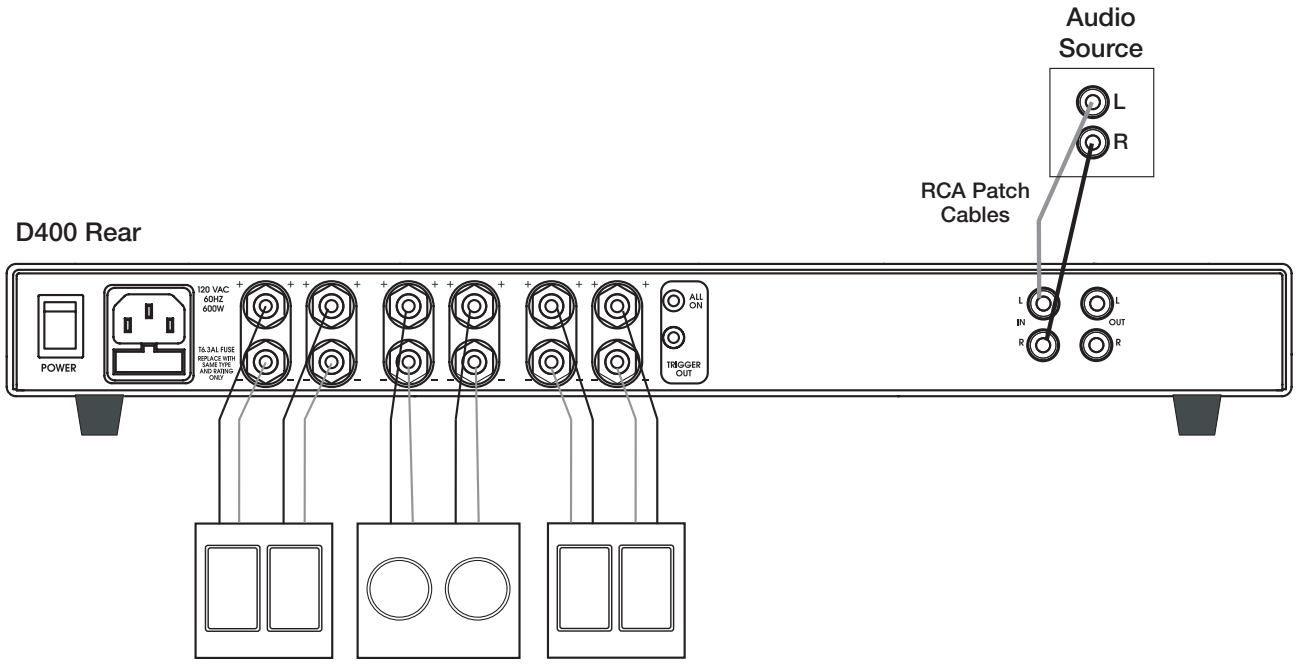
The D400 is specifically designed for multi-speaker applications. This amplifier is two Ohm stable and provides three sets of speaker terminals for easy connection of multiple speakers. With cool-running Class-T Digital Technology, Buffered Loop Outputs, and advanced Trigger options, the D400 can provide ample power for even the most power hungry applications.

Multiple Stereo Speakers in a Zone

The D400 is set up to easily power three stereo pairs of eight Ohm speakers (or any other combination that adds up to more than a two Ohm load). This makes it ideal for powering large areas with multiple speakers that will all play the same audio signal. Examples include large outdoor areas, ballroom/party rooms, gymnasiums, hallways, or any other area with multiple speakers.

WIRING CONSIDERATIONS

Speaker Wires	14-18 AWG Speaker Wire
Audio Cables	RCA Type Patch Cables
Triggers	2 Conductor Wire w/ Mono Mini-Plug

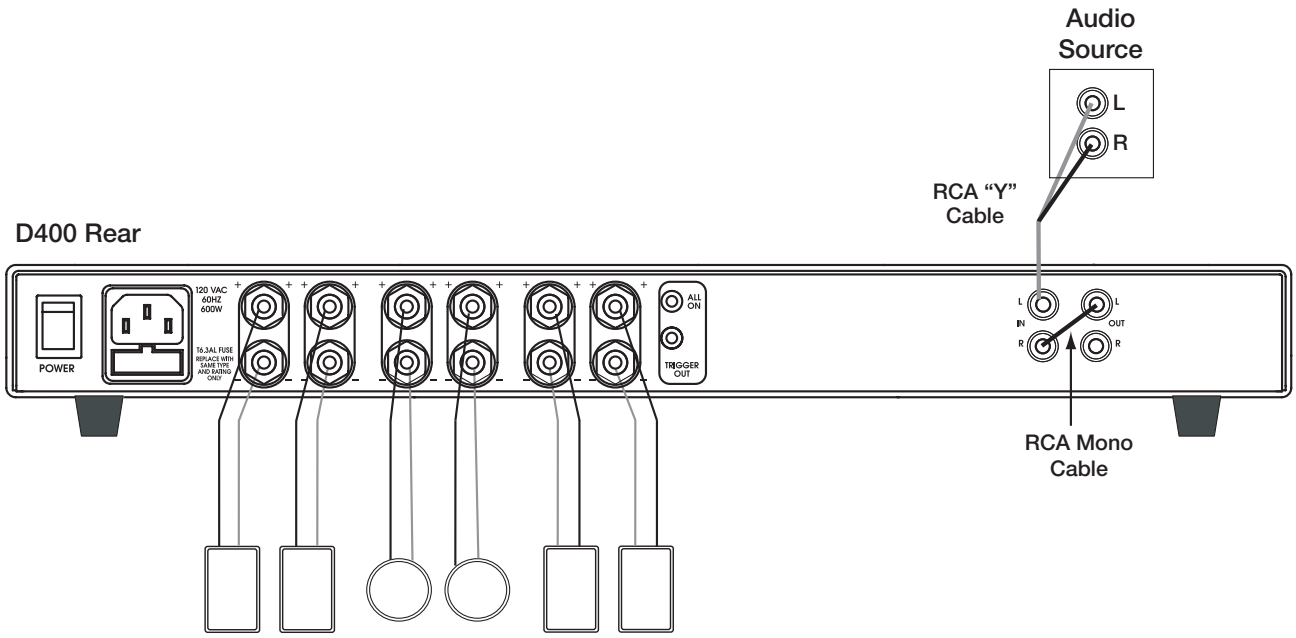


Multiple-Speaker Stereo Zone

- Audio Source to Line Inputs
- All Speakers Ramp Volume Up/Down Simultaneously

Multiple Mono Speakers in a Zone

Use RCA Y Cables to connect the D400's Input and Buffered Loop Output as shown below to create 6 mono channels. This is particulary useful for large areas where stereo imaging is not possible.



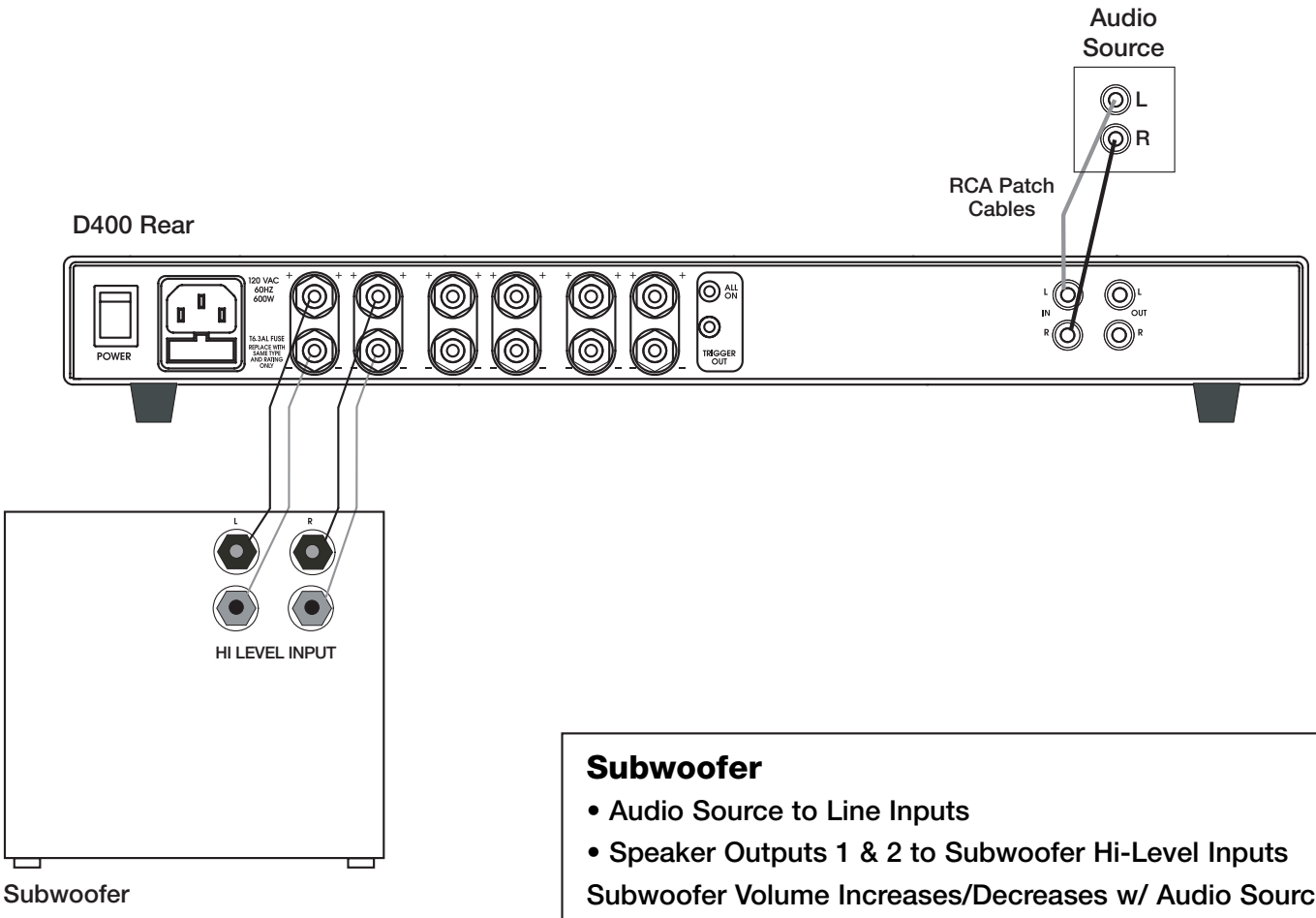
Multiple Mono Speakers

- Use RCA "Y" Cable to Combine L & R Audio
- Audio Source to Line Input 1
- Line Output 1 to Line Input 2

All Speakers Volume Ramps Up/Down Together

Powering a Passive Subwoofer

Connect one pair of the D400's Speaker Outputs to the speaker Input terminals of a passive subwoofer as shown below.



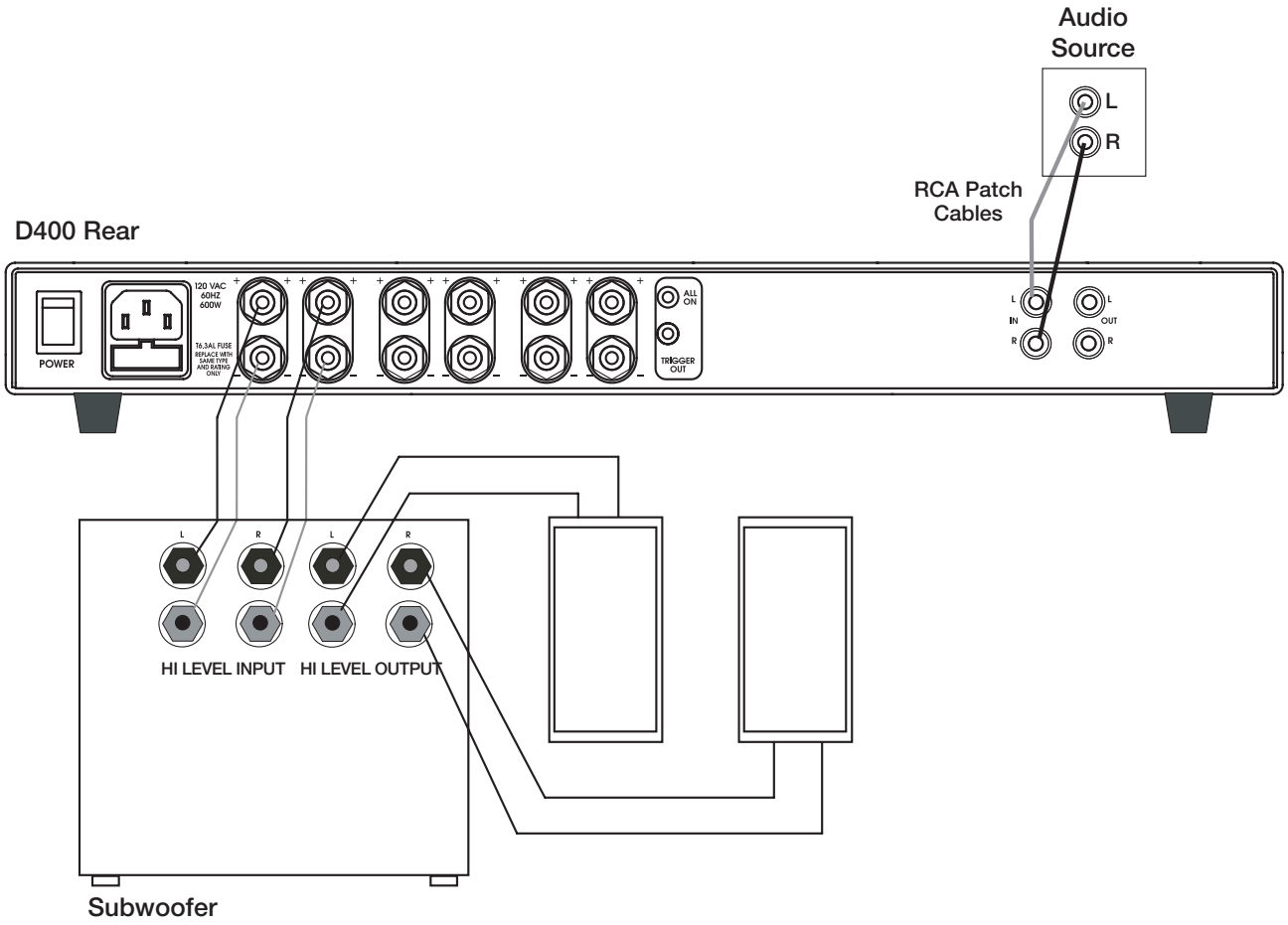
Subwoofer

- Audio Source to Line Inputs
- Speaker Outputs 1 & 2 to Subwoofer Hi-Level Inputs

Subwoofer Volume Increases/Decreases w/ Audio Source

Powering a Passive Subwoofer w/ Satellite Speakers

The high power capabilities of the D400 make it an excellent chice for subwoofer/ satellite (sub/sat) applications. Run a pair of speaker outputs from the D400 to the subwoofer speaker inputs. Run speaker wire from the subwoofers line-level Outputs to the satellite speakers as shown below..



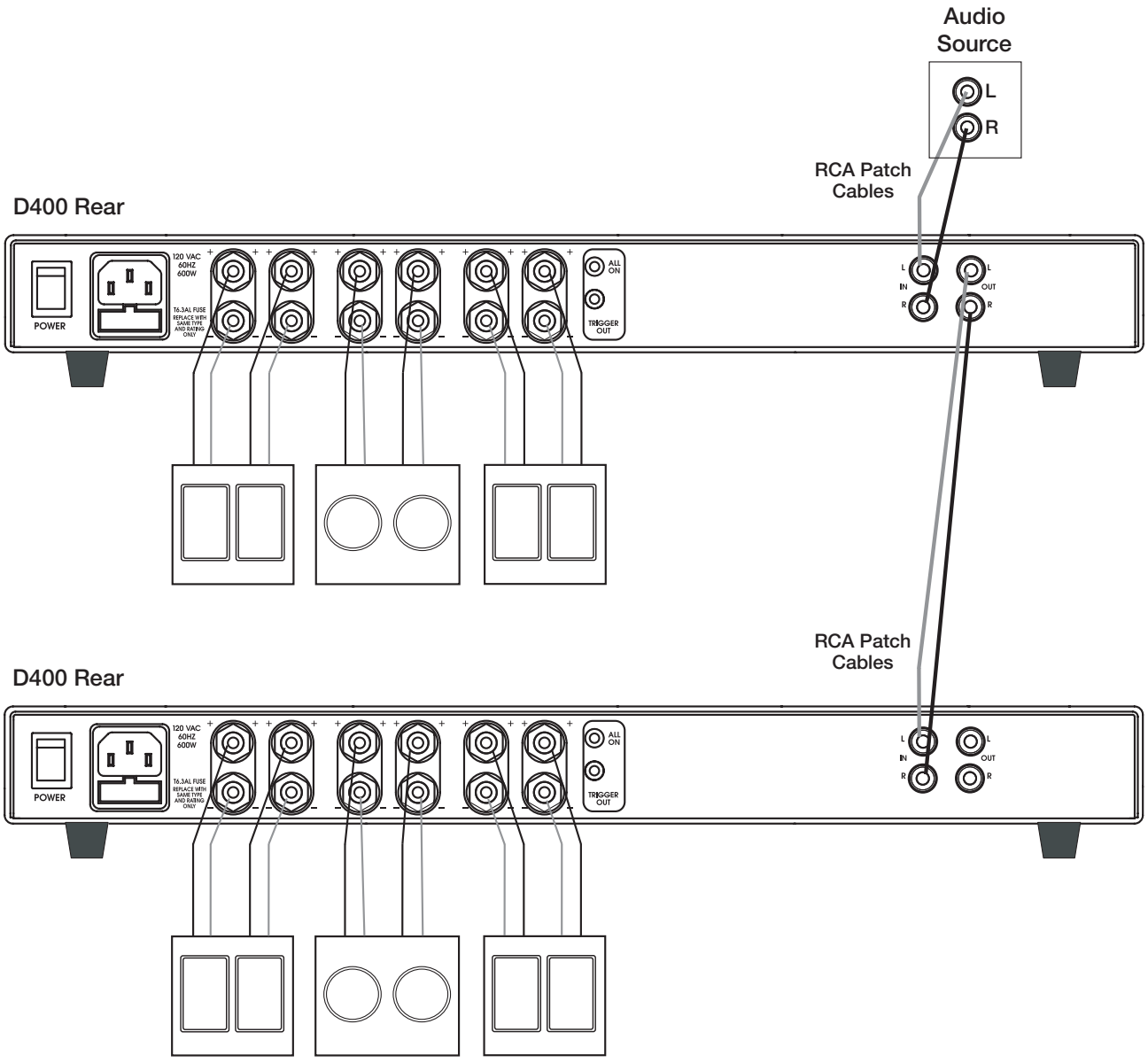
Subwoofer/Satellite

- Audio Source to Line Inputs
- Speaker Outputs 1 & 2 to Subwoofer Hi-Level Inputs
- Subwoofer Hi-Level Outputs to Satellite Speakers

Subwoofer/Satellite Volume Increases/Decreases w/ Audio Source

System Expansion-Stereo

ELAN Engineers had flexibility and system expansion in mind when they designed the D400. To add additional stereo rooms or zones to a basic system, simply add an another D400. To expand zones or subzones to include additional channels of amplification, use the Loop Outputs to send audio to additional D400s or other amplifiers.



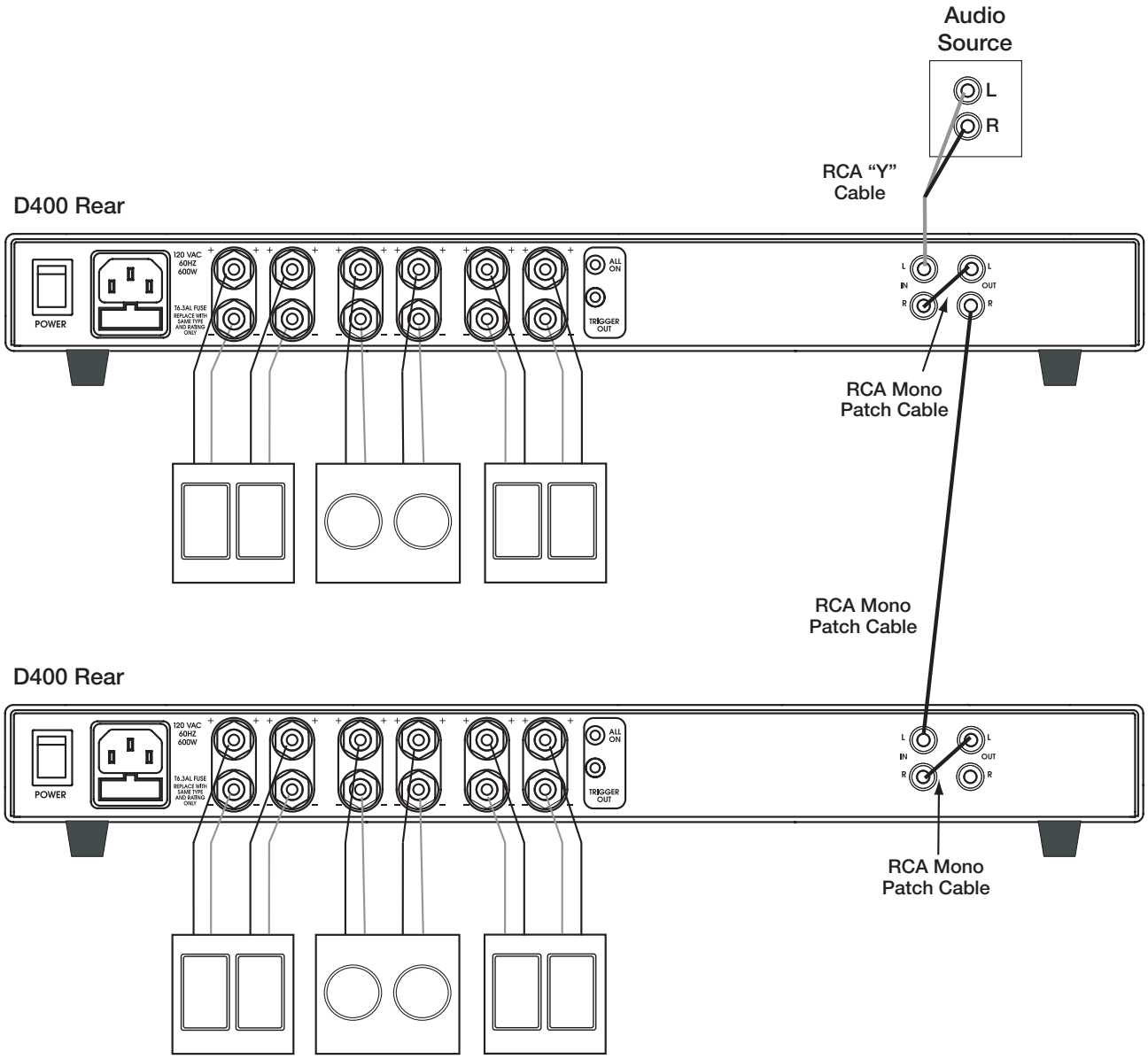
System Expansion-Stereo

- Audio Source to Line Inputs of D400 #1
- Line Outputs to Line Inputs of D400 #2

All Speakers Connected to Both Amps Volume Ramps Up/Down Together

System Expansion-Mono

To add additional mono rooms or zones to a basic system, simply add an another D400. Use RCA "Y" cables to combine an audio source's signal to the inputs of D400 #1. Use a mono RCA cable to send that signal to additional amplifiers as shown below.



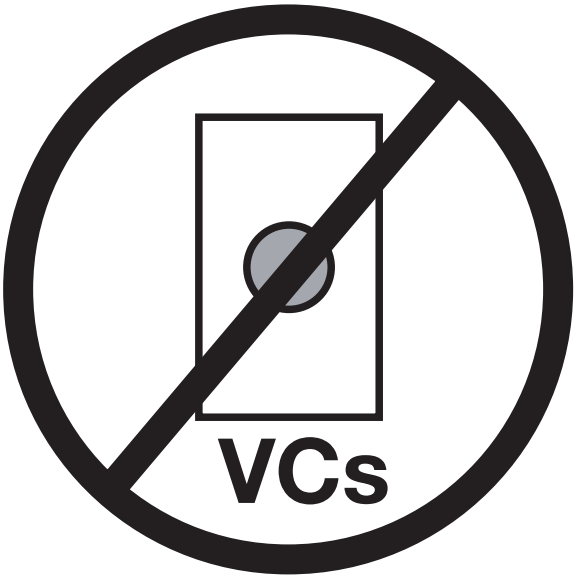
System Expansion-Mono

- Use RCA "Y" Cable to Combine L & R Audio
- Audio Source to Line Input 1 of D400 #1
- Line Output 1 to Line Input 2 of D400 #1
- Line Output 2 of D400 #1 to Line Input #1 of D400 #2
- Line Output 1 to Line Input 2 of D400 #2

All Speakers Connected to Both Amps Volume Ramps Up/Down Together

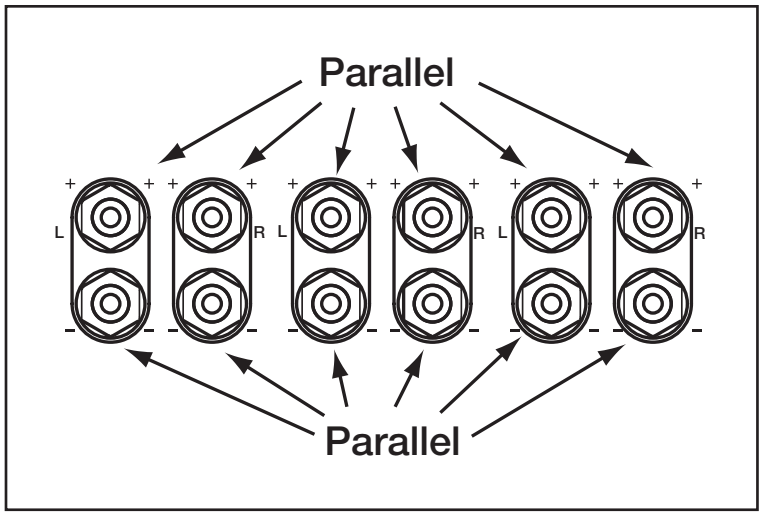
Volume Controls

Although it is possible to construct a simple stereo system utilizing one pair of speakers and a volume control, this amplifier is designed to run best directly connected to multiple speakers that all ramp volume up and down together. Most applications that are utilizing the full power potential of this amplfier are NOT APPROPRIATE for volume controls! Damage may occur to volume controls and the D400 if incorrectly configured.



Parallel Speaker Outputs

The D400 is a two channel amplifier with six speaker output terminals. Each pair of terminals is internally wired in parallel with the other pairs. Speaker outputs 1, 3, and 5 are common; speaker outputs 2, 4, and 6 are common. Please remember that when additional pairs of speakers are connected to the amplifier, the impedance drops in half and the output of the amplifier increases significantly. This is critical when determining the maximum power handling of a particular speaker.



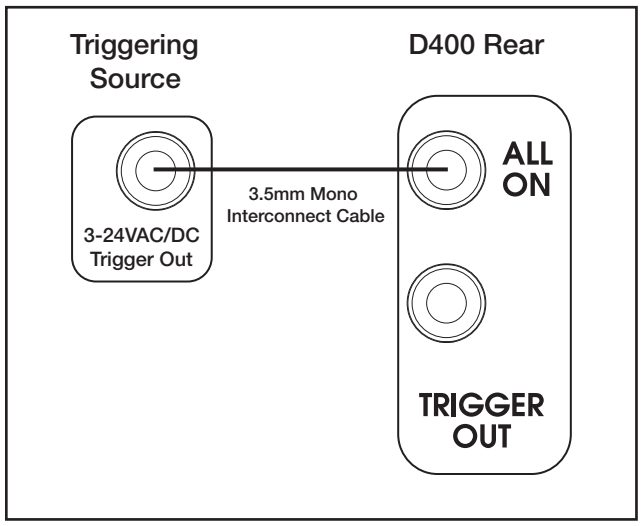
Triggers

The ALL ON trigger port automatically un-mutes the D400 when a 3-24 VDC signal is present and mutes it when the signal is absent. The Front Display of the D400 will show **"M"** when a channel is in Mute.

The 12 Volt DC Trigger Out is used to turn on other equipment, additional D400s, other amps, or to perform automated functions desired by the user.

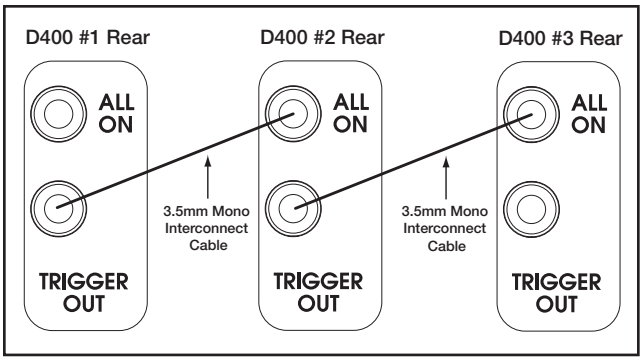
ALL ON

To Mute/Un-Mute the D400, simply connect a system-wide 3-24 Volt DC Triggering Source to the ALL ON Trigger Input using a 3.5mm mono interconnect cable. Examples of triggering sources include an ELAN Multi-Zone Controller's SYSTEM TRIGGER OUT or REMOTE OUT, an A/V receiver's switched outlet connected to a power supply, or a +12VDC TRIGGER OUT from another ELAN D Series amplifier.



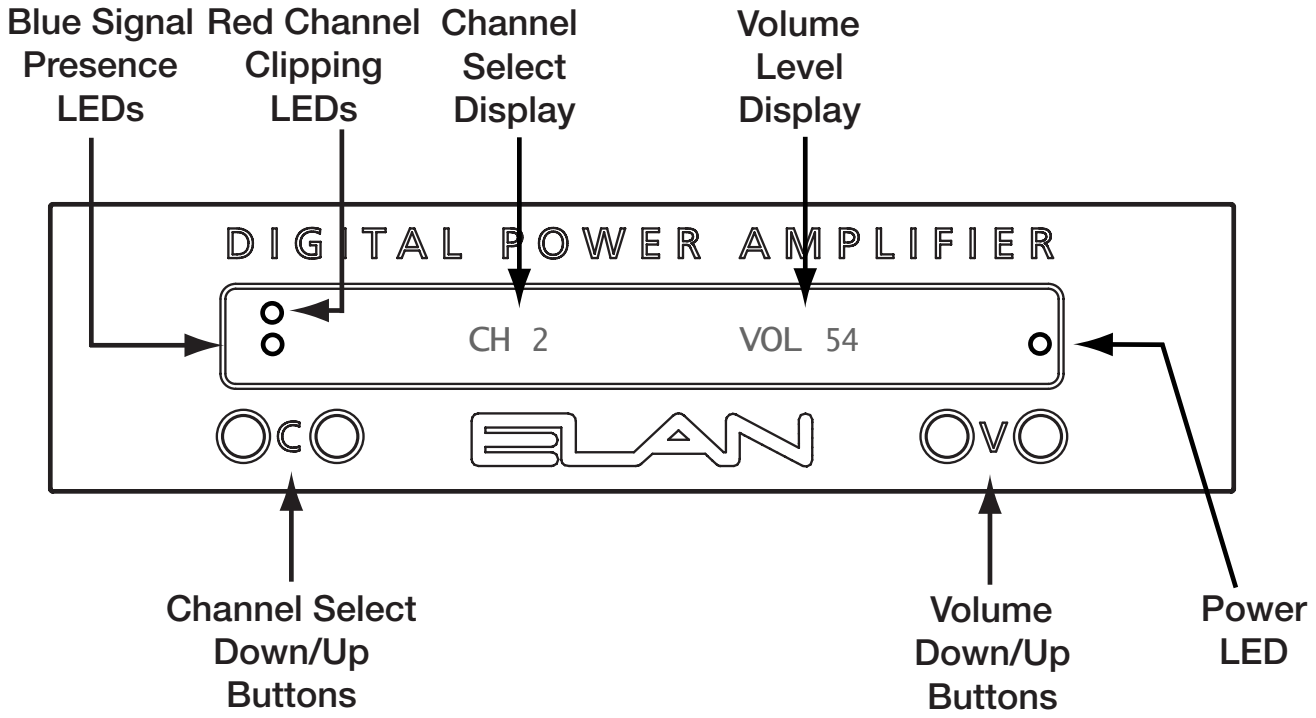
TRIGGER OUT

Whenever the D400 is powered On, the TRIGGER OUT becomes active. This output sends a +12VDC 100mA signal to other devices with a Trigger input. Examples of proper usage of the +12VDC TRIGGER OUT include muting/un-muting another D Series amplifier, triggering the switched outlets of a Z•Power Controller, or triggering an IR sequence using VIA!® products.



TRIGGER INPUTS ACCEPT 3 TO 24 VDC

3. Setup



Setting Channel Levels

Each amp channel can be individually adjusted from the front panel. Pressing the **C** button will toggle between the amp channels — Left and Right channels can be adjusted independently. The **C** button to the left cycles downward, the one on the right cycles upward. When the desired channel is displayed on the front panel, use the **V** buttons to adjust the level for the selected channel. The **V** button to the left lowers the volume, the one on the right raises the volume. Factory Default is 50.

Set the levels by first lowering them all the way down, then raise the volume of any keypads or volume controls to maximum. Slowly adjust Volume Up for this channel until the red clipping LEDs begin to light up, then drop the level one or two steps. Follow this procedure for all channels.

Lockout Mode

The Lockout feature is designed to disable all front panel functions. Use this feature once the system is fine-tuned and ready-to-go. By locking the D400's front panel, level adjustments cannot be inadvertantly changed.

To place the D400 in Lockout Mode:

1. With the Front Display dark, Press C- and V- simultaneously.
2. Continue pressing C- and V-. The Front Display will show the Volume setting momentarily.
3. Four seconds later, the Front Display will read LOCK. Release the buttons.
4. Follow the same procedure to Unlock the amp.

Please Note: *If the user tries to change settings while in Lockout Mode, the Front Display will read* ***"VOLUME LOCK IS ON"****.*

Factory Default

When your D400 arrives, it is set to a FACTORY DEFAULT condition. At some point during the life of this amplifier it may be necessary to put the unit back into Factory Default mode. If this unit is moved to a different location or speaker type or load are changed, the FACTORY DEFAULT procedure should be used:

1. Turn the D400 OFF using the rear Power Switch.
2. Turn the unit back ON. The Front Display will read **ELAN**.
3. Press and hold **C+**, **C-**, **V+**, and **V-** (all the front panel buttons at once) while **ELAN** is displayed.
4. The Front Display will now read "**FACTORY DEFAULT"**.

The Factory default settings are:

- All channels Volume defaults to 50.
- Lockout feature is Disabled.
- ACE ™ Automatic Clip Eliminator is Enabled.

Display Brightness Levels

The blue Signal and Power LED brightness levels on the Display can be increased or decreased from the Front Panel. Press and hold **C+** and **V+** to cycle between High, Low, and Off. The red Clipping LEDs cannot be adjusted.

4. Troubleshooting

SYMPTOM	CAUSE	SOLUTION
No Audio From One or More Channels	1. Loose/Bad Speaker Cable Connection	Check Cable Ends at Binding Posts and Speaker Terminals
	2. Break/Short in Speaker Cable	Check Continuity of Each Speaker Cable Using Multimeter. If Short or Open is Indicated, Check Wiring for Proper Connections.
	3. Speaker is defective	Swap with Known Good Speaker
	4. RCA Patch Cable Defective	Swap with Known Good Patch Cable.
	5. Source not Sending Audio	Verify Source is Powered Up and Playing. Check any Tape Monitor Settings on A/V Receiver.
"M" Flashes on Display,then Volume Setting	Channel is in MUTE	Make sure triggering device's remote output is connected and producing voltage.
"E" Message Displayed on Front Panel	Amplifier in Protection Mode	Find short or low-impedance condition. Correct overheating or AC power issues. Once issue is found and resolved, cycle power to D400. This condition could be caused by 1. 2.,3., and/or 4 above.
Audio "Hum"	1.Ground Potential Difference Between Source Components (Ground Loop)	Plug All Sources into Same AC Outlet.
		Test AC Outlet Using Ground Tester.
	2. Faulty/Damaged Cables	Check Source Equipment Cables For Damaged Cables and Faulty Connections.
	3. Faulty Wiring	Make Sure Any Volume Controls Are Not Hooked Up Backwards.
		Check for Shorts in Wiring (See item 2 in "No Audio…")
Distorted Audio at Normal Volume Levels	1. Input Gain Too High	Reduce Gain to the Channel in Question. Ensure Red Clipping LEDs are not Pulsing or On Constantly.
	2. Defective/Incompatible Speaker	Check for Physical Damage to Speaker
		Ensure speakers have an appropriate power rating for amplifier.
	3. Volume Control Miswired	Check for Proper Input/Output connections at Volume Control. INPUT Comes from Amplifier, OUTPUT Goes to Speakers.

Troubleshooting (cont.)

SYMPTOM	CAUSE	SOLUTION
Audio is Unclear, Bass Response Low	Speakers Out of Phase	Verify that + of Amplifier goes to + of Speaker (and – to -) on ALL Speaker Leads.
Incorrect Source Playing on Speakers	1. Source Connected to Wrong Input of Amplifier	Verify Source Input Connections.
	2. Speakers Connected to Wrong Speaker Outputs	Verify Speaker Connections.
Amplifier Will Not Power Up	1. Power Switch is OFF	Turn it ON. Switch is Located on Back of Unit.
	2. Circuit Breaker Tripped	The D400 Requires 7 Amps of 120VAC Current. Ensure that the Combined Current Draw of All Devices on a Circuit Does Not Exceed the Circuit's Capacity.
	3. Remote Turn-On Miswired	Ensure That Any Remote Turn On Cables are Connected At Both Ends. A Cable Plugged into the D400 Remote In, But Not Connected to a Source's Remote Out will Remain in Mute Mode.
Audio Very Distorted in Areas Using Volume Controls	1. Impedance-Match Settings Incorrect	Volume Controls not recommended
	2. Using Incompatible Volume Control	Volume Controls not recommended
Hum in Speakers When Audio is Not Present	Ground Loop	Use Triggers to Mute Audio Inputs When Audio is Not Present

Notes:

Limited Warranty

ELAN HOME SYSTEMS L.L.C. ("ELAN") warrants the D400/D401 to be free from defects in materials and workmanship for the period of two years (2 years) from date of purchase. If within the applicable warranty period above purchaser discovers that such item was not as warranted above and promptly notifies ELAN in writing, ELAN shall repair or replace the item at the company's option. This warranty shall not apply (a) to equipment not manufactured by ELAN, (b) to equipment which shall have been installed by other than an ELAN authorized installer, (c) to installed equipment which is not installed to ELAN's specifications, (d) to equipment which shall have been repaired or altered by others than ELAN, (e) to equipment which shall have been subjected to negligence, accident, or damage by circumstances beyond ELAN's control, including, but not limited to, lightning, flood, electrical surge, tornado, earthquake, or other catastrophic events beyond ELAN's control, or to improper operation, maintenance or storage, or to other than normal use of service. With respect to equipment sold by, but not manufactured by ELAN, the warranty obligations of ELAN shall in all respects conform to the warranty actually extended to ELAN by its supplier. The foregoing warranties do not cover reimbursement for labor, transportation, removal, installation or other expenses which may be incurred in connection with repair or replacement.

Except as may be expressly provided and authorized in writing by ELAN, ELAN shall not be subject to any other obligations or liabilities whatsoever with respect to equipment manufactured by ELAN or services rendered by ELAN.

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To ensure that consumers obtain quality pre-sale and after-sale support and service, ELAN Home Systems products are sold exclusively through authorized dealers. *ELAN products are not sold online*. The warranties on ELAN products are NOT VALID if the products have been purchased from an unauthorized dealer or an online E-tailer. To determine if your ELAN reseller is authorized, please call ELAN Home Systems at (859) 269-7760.

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