



## MC402 Power Amplifier



MC402

The lightning flash with arrowhead, 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.



AVIS RISQUE DE CHOC ELECTRIQUE - NE PAS OUVRIR.

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

**WARNING - TO REDUCE RISK OF FIRE OR ELECTRICAL SHOCK, DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE.**

**NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED PERSONNEL.**

To prevent the risk of electric shock, do not remove cover or back. No user serviceable parts inside.

## IMPORTANT SAFETY INSTRUCTIONS!

**PLEASE READ THEM BEFORE OPERATING THIS EQUIPMENT.**

### General:

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. **Warning: To reduce risk of fire or electrical shock, do not expose this equipment to rain or moisture. This unit is capable of producing high sound pressure levels. Continued exposure to high sound pressure levels can cause permanent hearing impairment or loss. User caution is advised and ear protection is recommended when playing at high volumes.**
6. **Caution: to prevent electrical shock do not use this (polarized) plug with an extension cord, receptacle or other outlet unless the blades can be fully inserted to prevent blade exposure. Attention: pour pevenir les chocs elecriques pas utiliser cette fiche polarisee avec un prolongateur, une prise de courant ou un autre sortie de courant, sauf si les lames peuvent etre inserees afond ans en laisser aucune partie a decouvert.**
7. Unplug this equipment during lightning storms or when unused for long periods of time.
8. Only use attachments/accessories specified by the manufacturer.

### Installation:

9. The equipment shall be installed near the AC Socket Outlet and the disconnect device shall be easily accessible.
10. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
11. Do not install near any heat sources such as radiators, heat registers, stoves, or other equipment (including amplifiers) that produce heat.
12. Do not use this equipment near water.
13. Do not expose this equipment to dripping or splashing and ensure that no objects filled with liquids, such as vases, are placed on the equipment.
14. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the equipment. When a cart is used, use caution when moving the cart/equipment combination to avoid injury from tip-over.



### Connection:

15. Connect this equipment only to the type of AC power source as marked on the unit.
16. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the equipment.
17. Do not defeat the safety purpose of the polarized or grounding-type plug.

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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 the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.

18. Do not overload wall outlets, extension cords or integral convenience receptacles as this can result in a risk of fire or electric shock.
19. To completely disconnect this equipment from the AC Mains, disconnect the power supply cord plug from the AC receptacle.

#### **Care of Equipment:**

20. Clean only with a dry cloth.
21. Do not permit objects or liquids of any kind to be pushed, spilled and/or fall into the equipment through enclosure openings.
22. Unplug the power cord from the AC power outlet when left unused for a long period of time.

#### **Repair of Equipment:**

23. Refer all servicing to qualified service personnel. Servicing is required when the equipment has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the equipment, the equipment has been exposed to rain or moisture, does not operate normally, or has been dropped.
24. Do not attempt to service beyond that described in the operating instructions. All other service should be referred to qualified service personnel.
25. When replacement parts are required, be sure the service technician has used replacement parts specified by McIntosh or have the same characteristics as the original part. Unauthorized substitutions may result in fire, electric shock, or other hazards.
26. Upon completion of any service or repairs to this product, ask the service technician to perform safety checks to determine that the product is in proper operating condition.

## **Thank You**

Your decision to own this McIntosh MC402 Power Amplifier ranks you at the very top among discriminating music listeners. You now have "The Best." The McIntosh dedication to "Quality," is assurance that you will receive many years of musical enjoyment from this unit.

Please take a short time to read the information in this manual. We want you to be as familiar as possible with all the features and functions of your new McIntosh.

## **Please Take A Moment**

The serial number, purchase date and McIntosh Dealer name are important to you for possible insurance claim or future service. The spaces below have been provided for you to record that information:

**Serial Number:** \_\_\_\_\_

**Purchase Date:** \_\_\_\_\_

**Dealer Name:** \_\_\_\_\_

## **Technical Assistance**

If at any time you have questions about your McIntosh product, contact your McIntosh Dealer who is familiar with your McIntosh equipment and any other brands that may be part of your system. If you or your Dealer wish additional help concerning a suspected problem, you can receive technical assistance for all McIntosh products at:

McIntosh Laboratory, Inc.  
2 Chambers Street  
Binghamton, New York 13903  
Phone: 607-723-1545  
Fax: 607-723-3636

## **Customer Service**

If it is determined that your McIntosh product is in need of repair, you can return it to your Dealer. You can also return it to the McIntosh Laboratory Service Department. For assistance on factory repair return procedure, contact the McIntosh Service Department at:

McIntosh Laboratory, Inc.  
2 Chambers Street  
Binghamton, New York 13903  
Phone: 607-723-3515  
Fax: 607-723-1917

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### Important Information

**Caution: The MC402 Amplifier weight is 110.5 pounds (50.1 kilograms). It requires two or more persons to safely handle when moving the amplifier.**

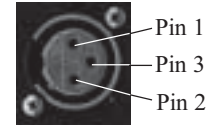
1. The following Connecting Cable is available from the McIntosh Parts Department:  
**Power Control Cable Part No. 170-202**  
Six foot, 2 conductor shielded, with two 1/8 inch stereo mini phone plugs.
2. For additional connection information, refer to the owner's manual(s) for any component(s) connected to the MC402.
3. The MC402 mutes the speaker outputs for approximately two seconds when first turned on.
4. It is very important that loudspeaker cables of adequate size be used, so that there will be no power loss. The size is specified in Gauge Numbers or AWG (American Wire Gauge).  
The smaller the Gauge number, the larger the wire size:  
If your loudspeaker cables are 50 feet (38.1m) or less, use at least 14 Gauge.  
If your loudspeaker cables are 100 feet (76.2m) or less, use at least 12 Gauge.
5. In the event that the MC402 over heats, due to improper ventilation and/or high ambient temperature, the protection circuits will activate. The Front Panel Power Guard LEDs will continuously indicate ON and the audio will be muted. When the MC402 has returned to a safe operating temperature, normal operation will resume.
6. The MC402 incorporates the very latest in Fully Double Balanced Circuitry. As a result, the Loudspeaker  $\ominus$  Negative Connections are above chassis ground and are not common between channels. Do not combine any connections together or ground them, except as illustrated in this manual.

### Connector Information

#### XLR Connectors

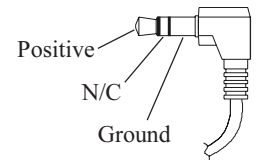
Below is the Pin configuration for the XLR Balanced Input and Output Connectors on the MC402. Refer to the diagram for connection:

- PIN 1: Shield/Ground
- PIN 2: + Input
- PIN 3: - Input



#### Power Control and Trigger Connectors

The MC402's Power Control Outputs provide a 5 volt signal. Use a 1/8 inch stereo mini phone plug to connect to the Power Control Input on other McIntosh Components.



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## Introduction

Now you can take advantage of traditional McIntosh standards of excellence in the MC402 Power Amplifier. Two 400 watt high current output channels will drive any high quality Loudspeaker system to its ultimate performance. The MC402 reproduction is sonically transparent and absolutely accurate. The McIntosh Sound is “The Sound of the Music Itself.”

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## Performance Features

- **Power Output**

The MC402 consists of two separate power amplifier channels, each capable of 400 watts into 2, 4 or 8 ohm speakers with less than 0.005% distortion.

- **Exclusive Double Balanced Circuitry**

Each channel of the MC402 consists of two balanced power amplifiers operating in push-pull with their outputs combined in a McIntosh Autoformer. This double balanced configuration from input to output cancels virtually all distortion.

- **Patented Autoformers**

McIntosh designed and manufactured Output Autoformers provide an ideal match between the amplifier output stages and speaker loads of 2, 4 and 8 ohms. The Autoformers also provide perfect DC protection for your valuable Loudspeakers.

- **Patented Power Guard**

Both channels include the patented McIntosh Power Guard circuit that prevents the amplifier from being over driven into clipping, with its harsh distorted sound that can also damage your valuable Loudspeakers.

- **Patented Sentry Monitor with Thermal Protection**

McIntosh Sentry Monitor power output stage protection circuits ensure the MC402 will have a long and trouble free operating life. Built-in Thermal Protection Circuits guard against overheating.

- **Power Control**

The McIntosh Power Control Circuit allows for remote turn-on of the MC402 Power Amplifier from a McIntosh Audio/Video Control Center or Preamplifier. If any additional McIntosh Power Amplifiers are part of the system a delayed Power Control Output Trigger is available. This delayed trigger reduces the strain on the house’s electrical wiring and protection devices.

- **Balanced and Unbalanced Inputs**

Balanced connections guard against induced noise and allow long cable runs without compromising sound quality.

- **Illuminated Power Meters**

The Illuminated Power Output Watt Meters on the MC402 are peak responding, and indicate the true power output of the amplifier. The Peak Watt Hold Mode allows the meters to temporarily stay at the highest power output and then slowly decay. The Front Panel Meter Illumination may be switched Off at any time.

- **Fiber Optic Solid State Front Panel Illumination**

The Illumination of the Front Panel is accomplished by the combination of custom designed Fiber Optic Light Diffusers and Light Emitting Diodes (LEDs). This provides even Front Panel Illumination, together with the extremely long life LEDs.

- **Glass Front Panel and Super Mirror Chassis Finish**

The famous McIntosh Illuminated Glass Front Panel with a three dimensional look and the Stainless Steel Chassis with Super Mirror Finish ensures the pristine beauty of the MC402 will be retained for many years.

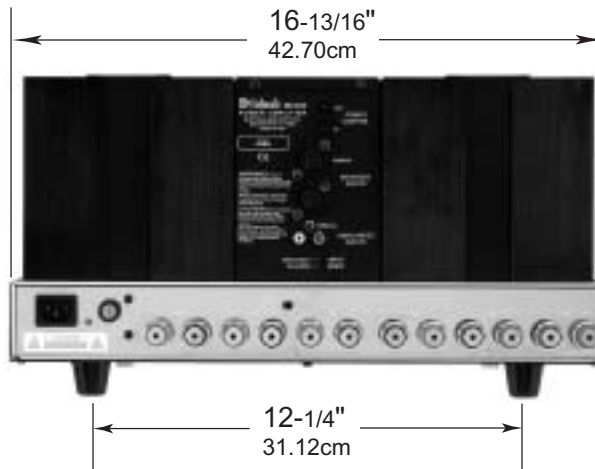
### Dimensions

The following dimensions can assist in determining the best location for your MC402. There is additional information on the opposite page pertaining to installing the MC402 into cabinets.

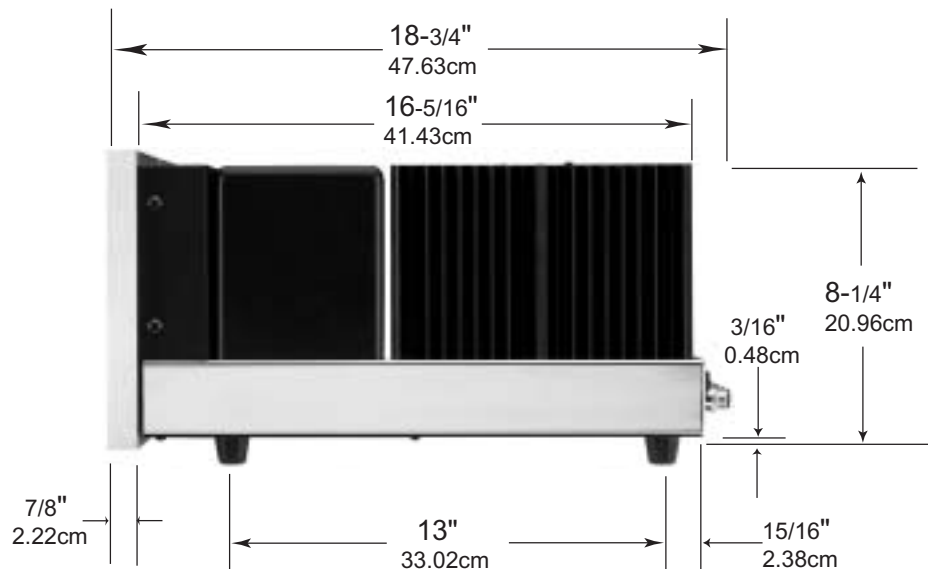
**Front View of the MC402**



**Rear View of the MC402**



**Side View of the MC402**





## Installation

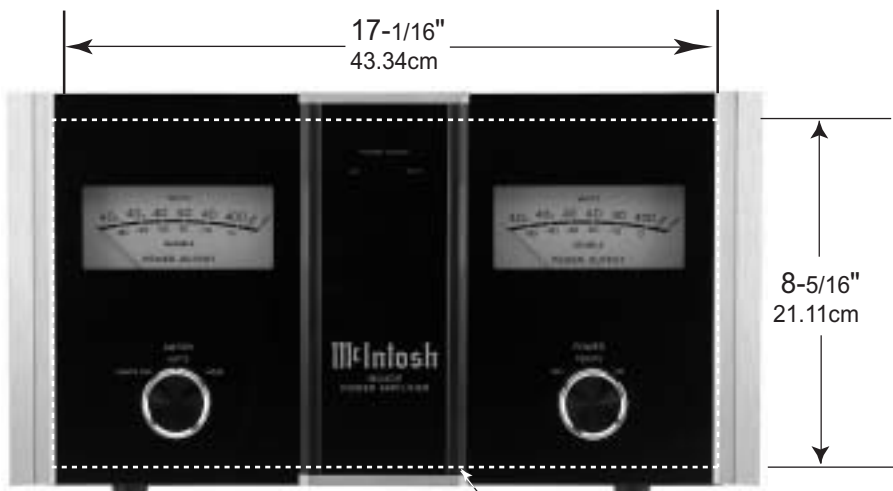
The MC402 can be placed upright on a table or shelf, standing on its four feet. It also can be custom installed in a piece of furniture or cabinet of your choice. The four feet may be removed from the bottom of the MC402 when it is custom installed as outlined below. The four feet together with the mounting screws should be retained for possible future use if the MC402 is removed from the custom installation and used free standing. The required panel cutout, ventilation cutout and unit dimensions are shown.

Always provide adequate ventilation for your MC402. Cool operation ensures the longest possible operating life for any electronic instrument. Do not install the MC402 directly above a heat generating component such as a high powered amplifier. If the MC402 is installed in a cabinet, a quiet running ventilation fan can be a definite asset in maintaining the coolest possible operating temperature.

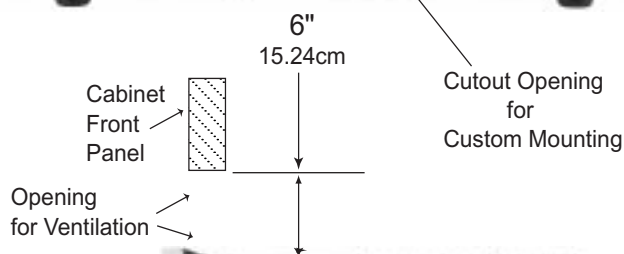
A custom cabinet installation should provide the following minimum spacing dimensions for cool operation. Allow at least 6 inches (15.24cm) above the top, 2 inches (3.81cm) below the

bottom and 3 inch (7.62cm) on each side of the amplifier, so that airflow is not obstructed. Allow 22 inches (55.88cm) depth behind the front panel. Allow 1 inch (2.54cm) in front of the mounting panel for knob clearance. Be sure to cut out a ventilation hole in the mounting shelf according to the dimensions in the drawing.

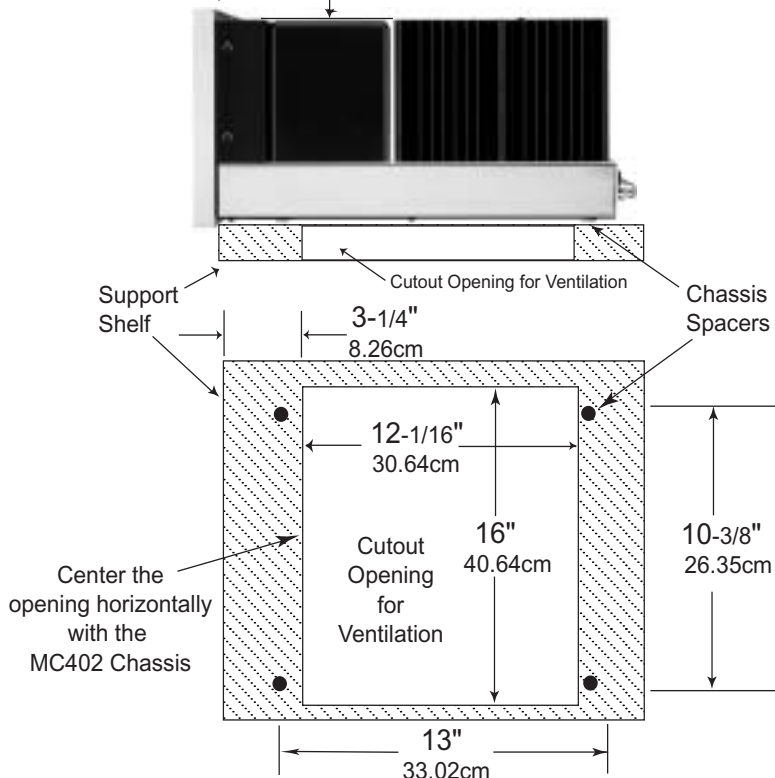
**MC402 Front Panel  
Custom Cabinet Cutout**

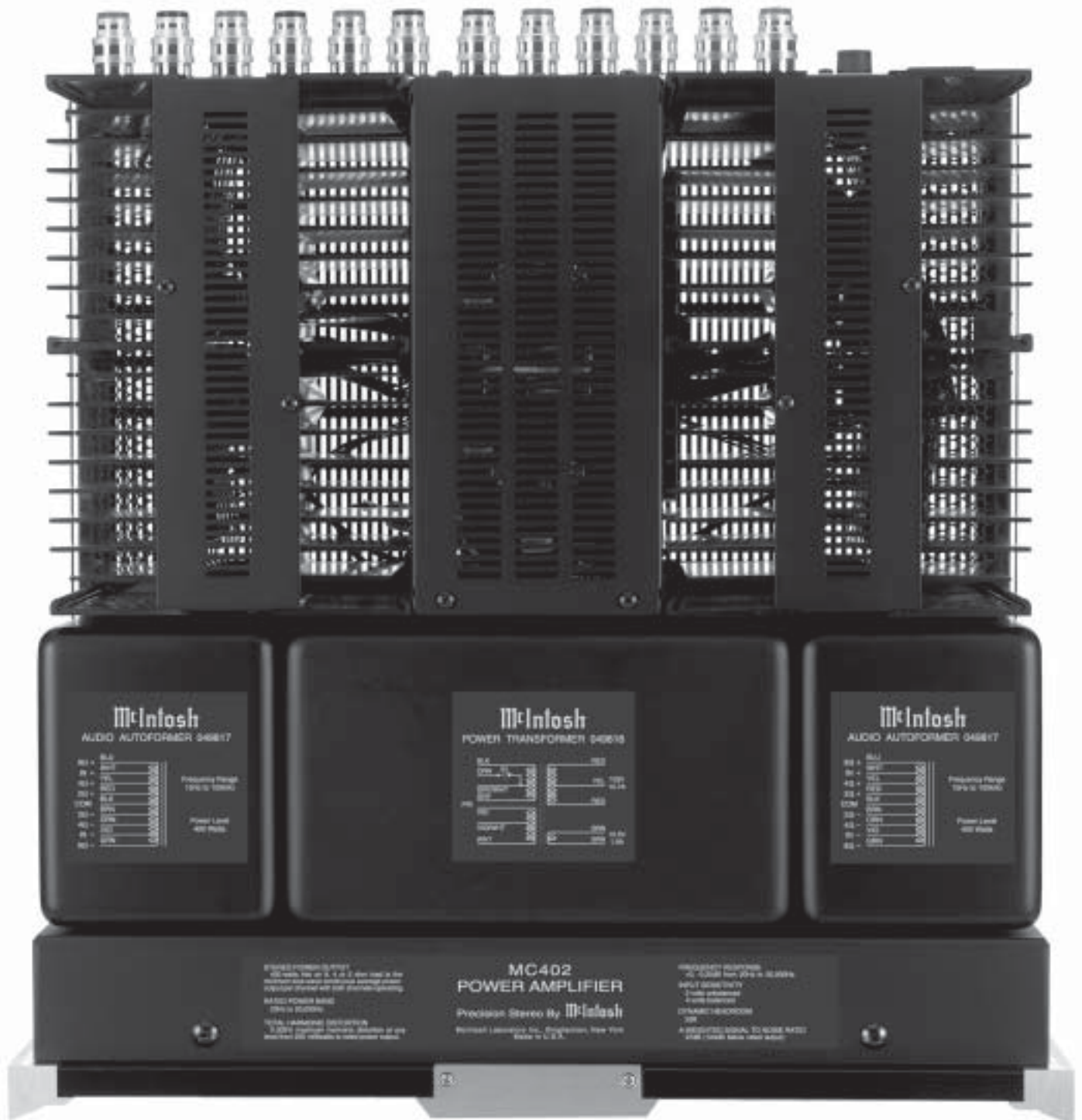


**MC402 Side View  
in Custom Cabinet**



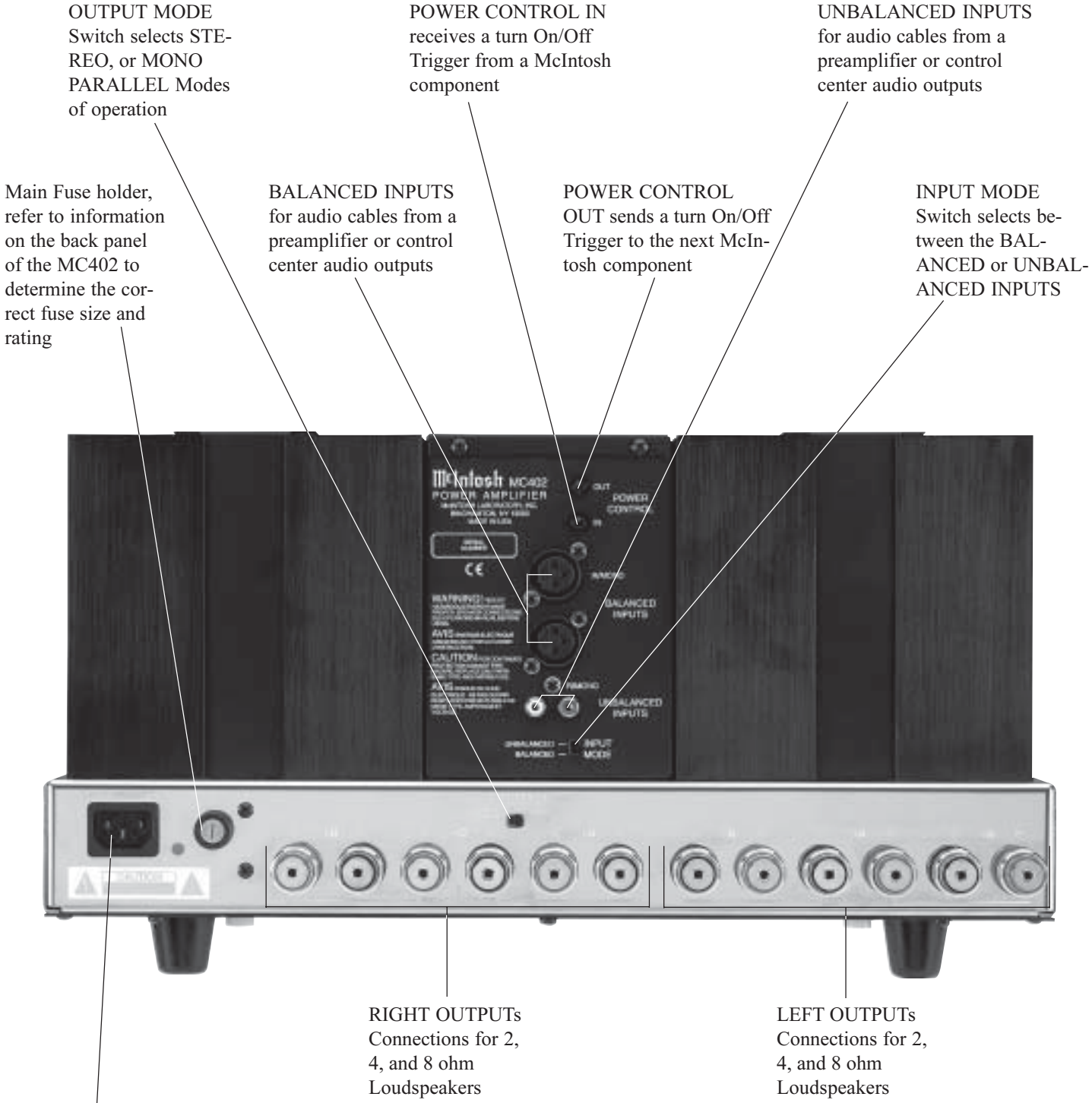
**MC402 Bottom View  
in Custom Cabinet**







# Rear Panel Connections and Switches



Connect the MC402 power cord to a live AC outlet. Refer to information on the back panel to determine the correct voltage

## How to Connect for Stereo

**Caution:** The supplied AC Power Cord should not be connected to the Rear Panel of the MC402 Amplifier until after the Loudspeaker Connections have been made and the supplied protective Terminal Connections Cover has been installed. Failure to observe this could result in Electric Shock.

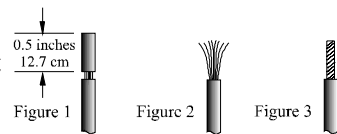
1. For Remote Power Control, connect a power control cable from the Audio Control Center or Preamplifier Power Control Out to the MC402 Power Control In.
2. Connect cables from the Balanced Outputs of a McIntosh Preamplifier or Control Center to the MC402 Balanced Inputs.

*Note:* An optional hookup is to use unbalanced cables.

3. Prepare the Loudspeaker Hookup Cables that attach to the MC402 Power Amplifier by choosing one of the methods below:

### Bare wire cable ends:

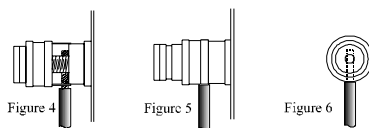
Carefully remove sufficient insulation from the cable ends, refer to figures 1, 2 & 3. If the cable is stranded, carefully twist the strands together as tightly as possible.



*Note:* If desired, the twisted ends can be tinned with solder to keep the strands together, or attach spade lug and/or banana connector.

### Spade lug or prepared wire connection:

Insert the spade lug connector or prepared section of the cable end into the terminal side access



hole, and tighten the terminal cap until the cable is firmly clamped into the terminal so the wires cannot slip out. Refer to figures 4, 5 & 6.

### Banana plug connection:

Insert the banana plug into the hole at the top of the terminal. Tighten the top portion of the terminal post and the set screw to secure the banana plug in place.

*Note:* The Banana Plugs are for use in the United States and Canada only.

4. Remove the five screws from the MC402 Chassis Rear Panel and Left Side. Retain these screws for later use. Refer to figure 7.
  5. Insert the Loudspeaker Hookup Cable Ends through the openings of the supplied Terminal Connections Cover and connect to the output terminals that match the Loudspeakers' Impedance, being careful to observe the correct polarities. Output impedance connections of 2 ohms, 4 ohms and 8 ohms are provided. If the Loudspeakers' Impedance is in-between the available connections, use the nearest lower impedance connection.
- WARNING:** Loudspeaker terminals are hazardous live and present a risk of electric shock. For additional instruction on making Loudspeaker Connections contact your McIntosh Dealer or McIntosh Technical Support.
6. Attach the Terminal Connections Cover, with the five previously removed screws, to the Rear Panel of the MC402 Amplifier. Refer to figure 7.
  7. Connect the MC402 power cord to an active AC outlet.

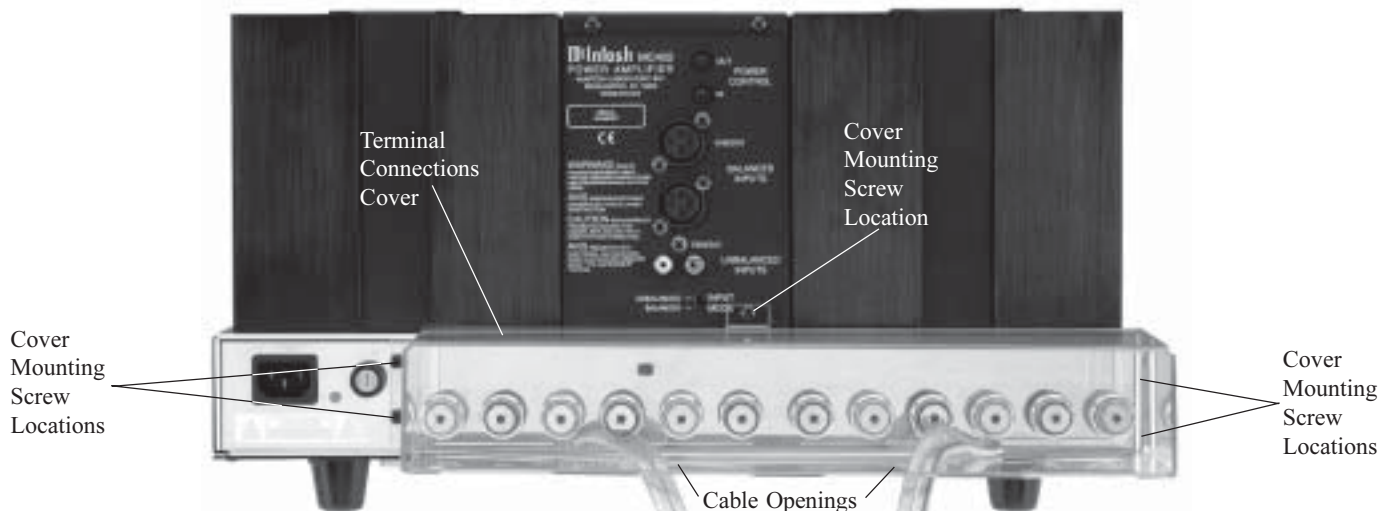
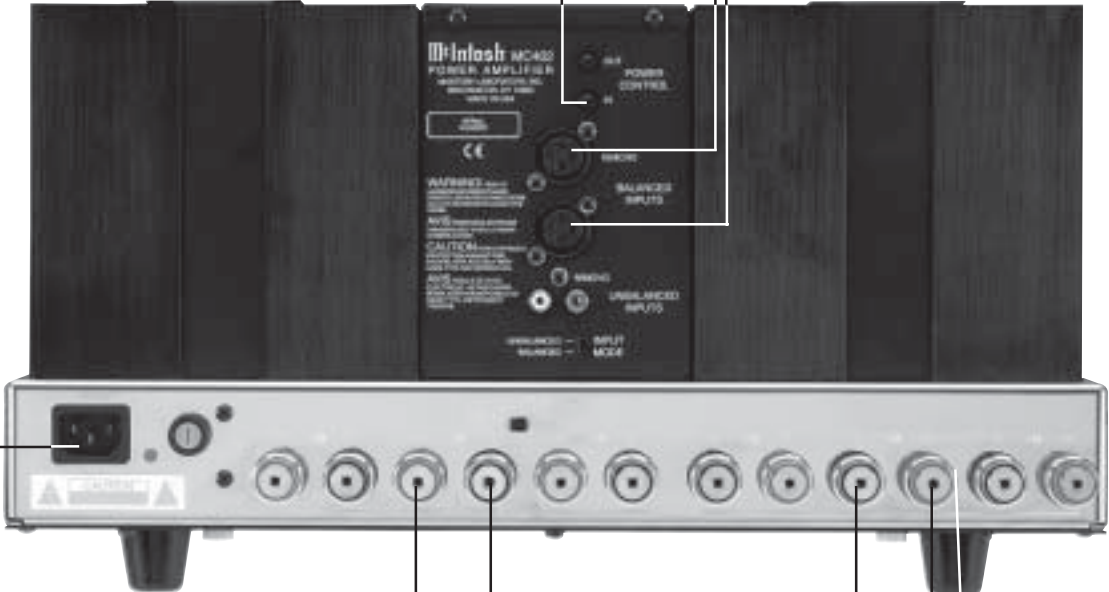
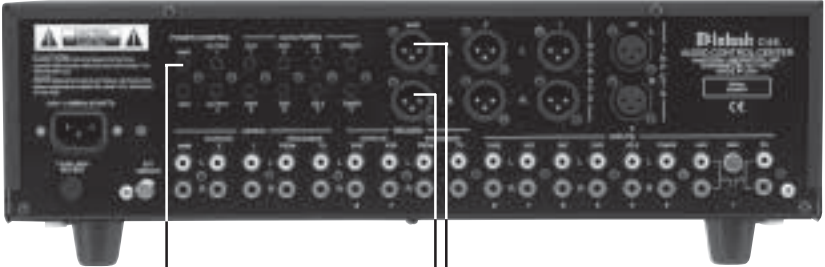


Figure 7

McIntosh Audio Control Center



To AC Outlet



Right Loudspeaker  
4 ohm



Left Loudspeaker  
4 ohm

## How to Connect for Mono Parallel

**Caution:** The supplied AC Power Cord should not be connected to the Rear Panel of the MC402 Amplifier until after the Loudspeaker Connections have been made and the supplied protective Terminal Connections Cover has been installed. Failure to observe this could result in Electric Shock.

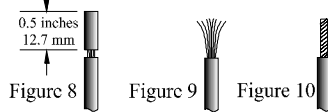
1. For Remote Power Control, connect a power control cable from the Audio Control Center or Preamplifier Power Control Out to the MC402 Power Control In.
2. Connect a cable from the Balanced Output of a McIntosh Preamplifier or Control Center to the MC402 R/MONO Balanced Input.

*Note:* An optional hookup is to use an unbalanced cable.

3. Prepare three Loudspeaker Hookup Cables, one twelve inch (30.48 cm) and one thirteen inch (33.02 cm) Jumper Cables, along with the desired length in a Loudspeaker Hookup Cable that attaches to the MC402 Power Amplifier Output Terminals by choosing one of the methods below:

### Bare wire cable ends:

Carefully remove sufficient insulation from the cable ends, refer to figures 8, 9 & 10. If the cable is stranded, carefully twist the strands together as tightly as possible.



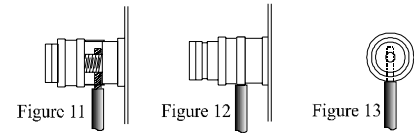
*Note:* If desired, the twisted ends can be tinned with solder to keep the strands together, or attach spade lug and/or banana connector.

### Spade lug or prepared wire connection:

Insert the spade lug connector or prepared section of the cable end into the terminal side access hole, and tighten the terminal cap until the cable is firmly clamped into the terminal so the wires cannot slip out. Refer to figures 11, 12 & 13.

### Banana plug connection:

Insert the banana plug into the hole at the top of the terminal.



Tighten the top

portion of the terminal post and the set screw to secure the banana plug in place.

*Note:* The Banana Plugs are for use in the United States and Canada only.

4. Remove the five screws from the MC402 Chassis Rear Panel and Left Side. Retain these screws for later use. Refer to figure 14.
5. Connect the prepared twelve inch (30.48 cm) Jumper Cable between the two  $\ominus$  Output terminals and the thirteen inch (33.02 cm) Jumper Cable between the two appropriate Impedance  $\oplus$  Output Terminal as outlined in the chart located on the next page.
6. Insert the Loudspeaker Hookup Cable Ends through the openings of the supplied Terminal Connections Cover and connect to the output terminals that match the Loudspeakers' Impedance, being careful to observe the correct polarities. Output impedance connections of 1 ohms, 2 ohms and 4 ohms are provided. If the Loudspeakers' Impedance is in-between the available connections, use the nearest lower impedance connection.

**WARNING:** Loudspeaker terminals are hazardous live and present a risk of electric shock. For additional instruction on making Loudspeaker Connections contact your McIntosh Dealer or McIntosh Technical Support.

7. Attach the Terminal Connections Cover, with the five previously removed screws, to the Rear Panel of the MC402 Amplifier. Refer to figure 7.
8. Connect the MC402 power cord to an active AC outlet.

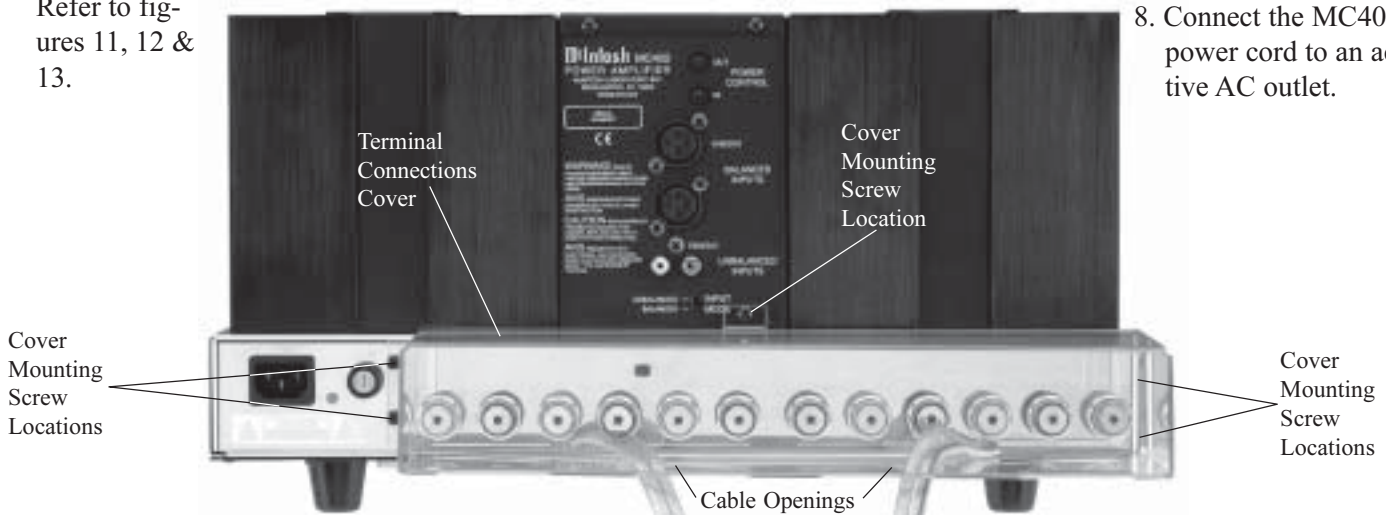
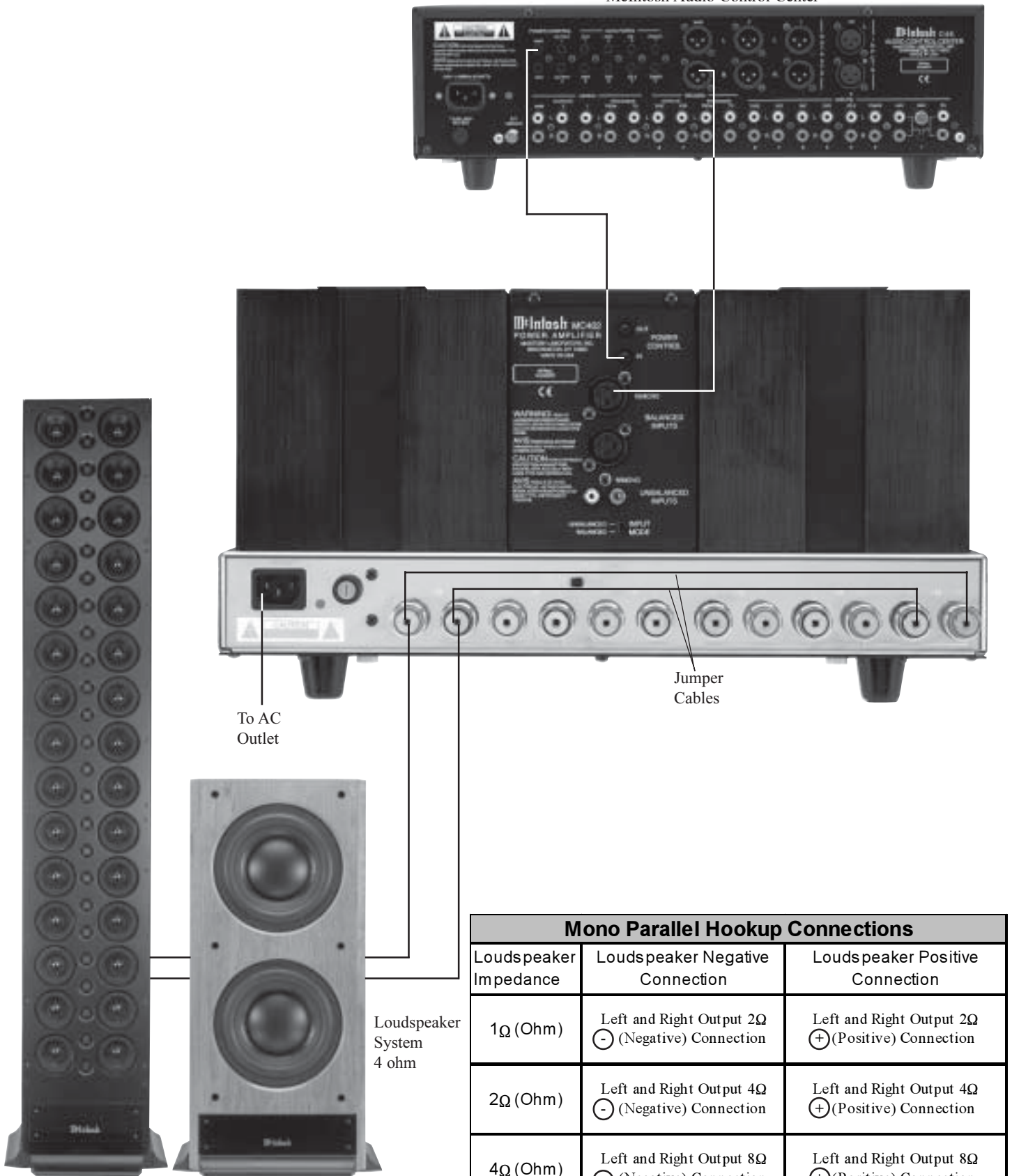


Figure 14



McIntosh Audio Control Center



Mono Parallel Hookup Connections		
Loudspeaker Impedance	Loudspeaker Negative Connection	Loudspeaker Positive Connection
1Ω (Ohm)	Left and Right Output 2Ω (-) (Negative) Connection	Left and Right Output 2Ω (+) (Positive) Connection
2Ω (Ohm)	Left and Right Output 4Ω (-) (Negative) Connection	Left and Right Output 4Ω (+) (Positive) Connection
4Ω (Ohm)	Left and Right Output 8Ω (-) (Negative) Connection	Left and Right Output 8Ω (+) (Positive) Connection

POWER GUARD LED lights when the Amplifier Left Channel POWER GUARD Circuit activates

POWER GUARD LED lights when the Amplifier Right Channel POWER GUARD Circuit activates

METER indicates the Left Channel Power Output of the amplifier

Remote On Indicator lights when the amplifier is in the Remote Turn-On Mode

METER indicates the Right Channel Power Output of the amplifier



METER Switch selects the display modes of the Power Output Meters

POWER Switch Turns AC Power Off, Remote or On



## How to Operate the MC402

### Power On

To have the MC402 automatically turn On or Off when a McIntosh Control Center turns On or Off, rotate the power switch to the REMOTE Position. For manual operation, rotate the power switch to the ON or OFF Position as desired. Refer to figure 15.



Figure 15

*Note: There must be a power control connection between the MC402 and the McIntosh Control Center, in order for the remote power turn on to function.*

### Meter Selection

Rotate the meter mode switch to select the meter operation mode you desire. Refer to figures 16 and 17.

**Lights Off** - Meter lights are turned off and the meters will continue to indicate the power output.

**Watts** - The meters respond to all the musical information being produced by the amplifier. They indicate to an accuracy of at least 95% of the power output with only a single cycle of a 2000Hz tone burst.



Figure 16

**Hold** - The meter pointer is locked to the highest power peak in a sequence of peaks. It is electronically held to this power level until a higher power peak passes through the amplifier. The meter pointer will then rise to the

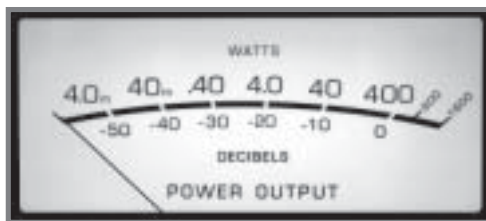


Figure 17

newer higher indication. If no further power peaks are reached, the meter pointer will very slowly return to its rest position or lower power level.

*Note: The MC402 Power Output Meters indicate the wattage delivered to the Loudspeakers. When in Mono Parallel, the actual power output is the sum of both the Right and Left Meter Indications.*

### Mode Switches

The MONO PARALLEL/STEREO Mode Switch, which is located above the Right Channel Outputs on the Rear Panel of the MC402, allows selection of either MONO PARALLEL or STEREO Modes of Operation. Refer to figures 18.



Figure 18

*Note: There is additional information for connecting the MC402 and pertaining to both modes of operation:*

*“How to Connect for Stereo” on pages 10 and 11.*

*“How to Connect for Mono Parallel” on pages 12 and 13.*

The Input Mode Switch, which is located below the UNBALANCED INPUTS on the Rear Panel of the MC402, allows selection of either the UNBALANCED or BALANCED Input Connectors. Refer to figure 19.



Figure 19

## Technical Description

McIntosh Laboratory, the company who introduced the world's first amplifier that could be called "High Fidelity", has done it again. The McIntosh engineering staff has created a power amplifier without compromise, using the most advanced McIntosh circuit design concepts.

A continuous average power output rating of 400 watts and with an output current of greater than 100 amperes per channel, makes this not only the most advanced, but also one of the most powerful amplifiers McIntosh has ever manufactured. The distortion limits for the MC402 are no more than 0.005% at rated power output for all frequencies from 20Hz to 20,000Hz. Typical performance at mid frequencies is less than 0.002%. The true distortion readings on the MC402 are so low, it takes special measuring techniques to make accurate readings. The MC402 can deliver the best possible performance from any type of high quality Loudspeaker system.

Creating an amplifier with this level of performance did not come easily. Many months of design, testing and measuring were required. Extensive controlled listening tests, the ultimate form of measuring, were made before the final design was accepted.

### Design Philosophy

The design philosophy incorporated in the MC402 involved several different techniques, all based on sound scientific logic. Every stage of voltage or current amplification must be as linear as possible prior to the use of nega-

tive feedback. McIntosh engineers know how to properly design negative feedback circuits so they contribute to the extremely low distortion performance expected from a McIntosh amplifier. The typical McIntosh owner would never accept the approximately 100 times higher distortion of many non-feedback designs.

Double Balanced Push-Pull design is used from input to output. Each half of the amplifier contains complimentary balanced circuitry. The resulting double balanced configuration cancels even order distortion. Refer to figure 20.

All transistors are selected to have nearly constant current gain over the entire current range they must cover. Output transistors in particular, have matched uniform current gain, high current bandwidth product and large active region safe operating area. An automatic tracking bias system completely eliminates any trace of crossover distortion. Precision metal film resistors and low dielectric absorption film capacitors are used in all critical circuit locations.

The output signals of the balanced circuit are coupled in the unique McIntosh MC402 Output Autoformer. It provides low distortion power transfer at frequencies from below 20Hz to well beyond 20,000Hz with optimum impedance points of two ohms, four ohms and eight ohms. The unequalled expertise of McIntosh in the design and manufacturing of autoformers is legendary in the high fidelity industry.

The high efficiency circuit design of the MC402 con-

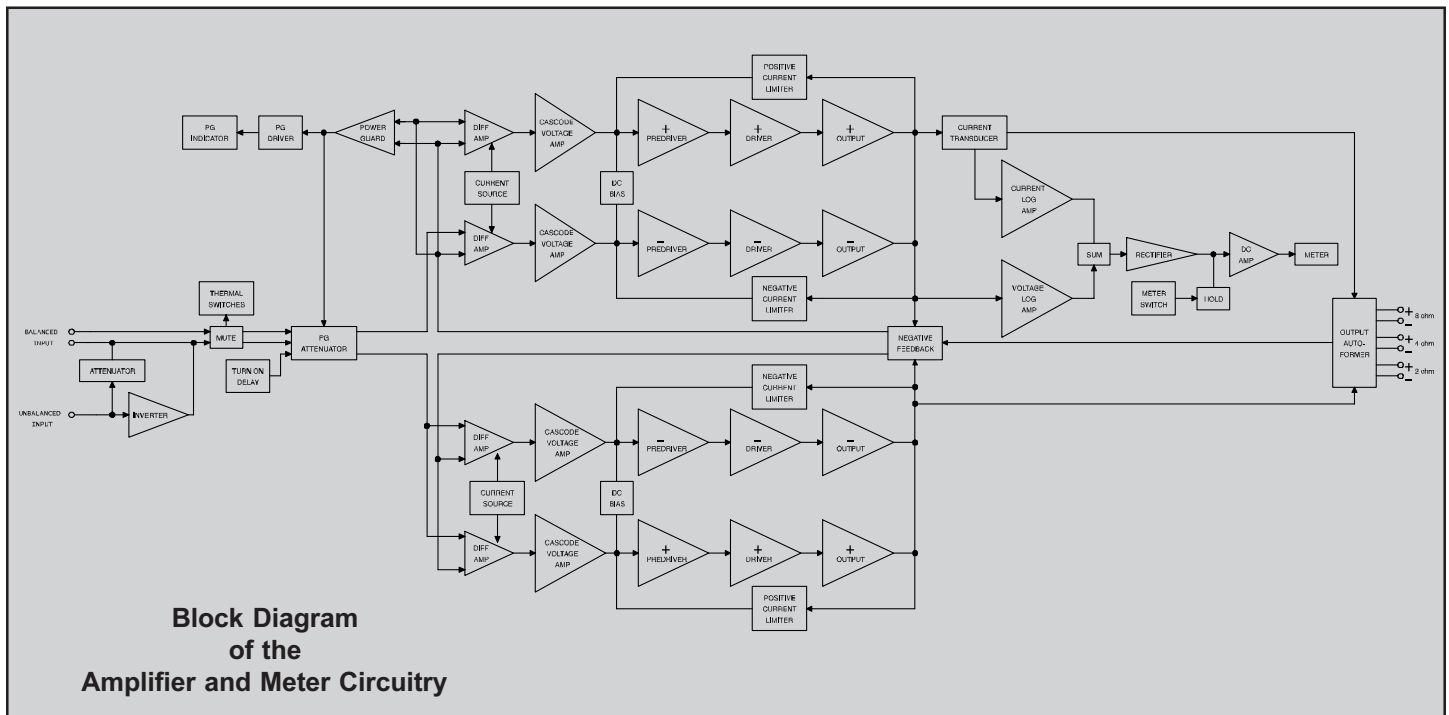


Figure 20

tributes to low operating temperatures. More than 2,000 square inches of heat sink area keep the MC402 operating safely with convection cooling. No fans are needed.

**Autoformers**

All solid state power amplifier output circuits work best into an optimum load. This optimum load may vary considerably from what a Loudspeaker requires. In the case of more than one Loudspeaker connected in parallel, the load to the power amplifier may drop to two ohms or even less. A power amplifier connected to a load that is lower than optimum, causes more output current to flow, which results in extra heat being generated in the power output stage. This increase in temperature will result in a reduced life expectancy for the amplifier.

The Autoformer creates an ideal match between the power amplifier output stage and the Loudspeaker. A McIntosh amplifier with an Autoformer can be used to safely drive multiple speakers without reducing the life expectancy of the power amplifier. Refer to Figure 21.



Figure 21

There is absolutely no performance limitation with an Autoformer. Its frequency response exceeds that of the output circuit itself, and extends well beyond the audible range. Its distortion level is so low it is virtually impossible to measure.

In the rare event of a power amplifier output circuit failure, the McIntosh Autoformer provides absolute protection from possible damage to your valuable Loudspeakers. The unequalled expertise of McIntosh in the design and manufacturing of Autoformers is legendary in the high fidelity industry. McIntosh engineers know how to do it right.

**Protection Circuits**

The different types of protection circuits incorporated in the MC402 insure a long and safe operating life. This is just one of the many characteristics of McIntosh Power Amplifiers that make them world famous. The MC402 incorporates the McIntosh Sentry Monitor Output Transistor Protection Circuit, which protects the amplifier in the event of a shorted Loudspeaker Connec-

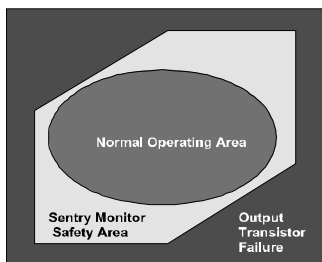


Figure 22

tion. Refer to Figure 22.

The MC402 also includes the unique patented McIntosh Power Guard circuit. Power Guard eliminates the possibility of ever overdriving the amplifier into clipping. Figures 23, 24 and 25 are actual Spectrum Analyzer measurements of a McIntosh Power Amplifier, with a test signal consisting of 14kHz and 15kHz sine waves. An overdriven amplifier can produce both audible and inaudible distortion levels exceeding 40%. The audible distortion is unpleasant to hear, but the inaudible ultrasonic distortion is also undesirable, since it can damage valuable Loudspeaker system tweeters. You will never experience the harsh and damaging distortion due to clipping.

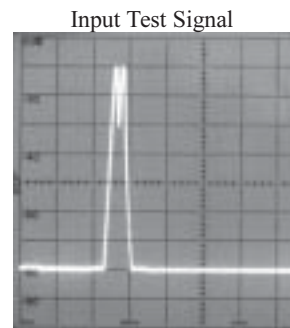


Figure 23



Figure 24

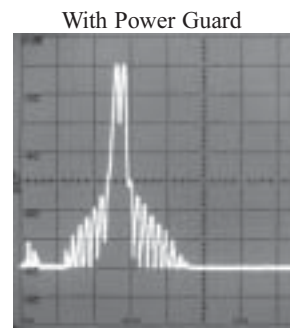


Figure 25

The Power Guard circuit is a waveform comparator, monitoring both the input and output waveforms. Under normal operating conditions, there are no differences between the shape of these waveforms. If an amplifier channel is overdriven, there will be a difference between the two signal waveforms. When the difference exceeds 0.3% (equivalent to 0.3% harmonic distortion), the Power Guard activates the PG light and a dynamic electronic attenuator at the amplifier input reduces the input volume just enough to prevent any further increase in distortion.

The Power Guard circuit acts so fast that there are absolutely no audible side effects and the sonic purity of the music reproduction is perfectly preserved. The MC402 Power Amplifier with Power Guard is not limited to just the rated power output, but will actually produce distortion free output well above its rated power due to the McIntosh philosophy of conservative design.

**Power Supply Circuits**

To compliment the fully balanced design of the MC402, there are huge main filter capacitors that guarantee an excellent signal to noise ratio and the energy storage necessary for the wide dynamic range that "Digital Audio" demands.

### Specifications

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#### Power Output Stereo

Minimum sine wave continuous average power output per channel, all channels operating is:

400 watts into 2 ohm load

400 watts into 4 ohm load

400 watts into 8 ohm load

#### Power Output Mono Parallel

Minimum sine wave continuous average power output is:

800 watts into 1 ohm load

800 watts into 2 ohm load

800 watts into 4 ohm load

#### Output Load Impedance

2, 4 or 8 ohms (Stereo Mode)

1, 2 or 4 ohms (Mono Mode)

#### Rated Power Band

20Hz to 20,000Hz

#### Total Harmonic Distortion

Maximum Total Harmonic Distortion at any power level from 250 milliwatts to rated power output is 0.005%

#### Intermodulation Distortion

Maximum Intermodulation Distortion if instantaneous peak output per channel does not exceed twice the rated output, for any combination of frequencies from 20Hz to 20,000Hz, with all channels operating is 0.005%

#### Dynamic Headroom

2.1dB

#### Frequency Response

+0, -0.25dB from 20Hz to 20,000Hz

+0, -3dB from 10Hz to 100,000Hz

#### Sensitivity

2.0 Volts Unbalanced Input

4.0 Volts Balanced Input

#### A-Weighted Signal To Noise Ratio

94dB Unbalanced (120dB below rated output)

98dB Balanced (124dB below rated output)

#### Input Impedance

10,000 ohms Unbalanced Inputs

20,000 ohms Balanced Inputs

#### Wide Band Damping Factor

Greater than 40

#### Power Requirements

100 Volts, 50/60Hz at 12 amps

110 Volts, 50/60Hz at 11 amps

120 Volts, 50/60Hz at 10 amps

220 Volts, 50/60Hz at 5 amps

230 Volts, 50/60Hz at 5 amps

240 Volts, 50/60Hz at 5 amps

*Note: Refer to the rear panel of the MC402 for the correct voltage.*

#### Overall Dimensions

17-1/2 inches (44.45cm) W, 9-7/16 inches (23.97cm) H, 20 inches (50.8cm) D, including clearance for connectors

#### Weight

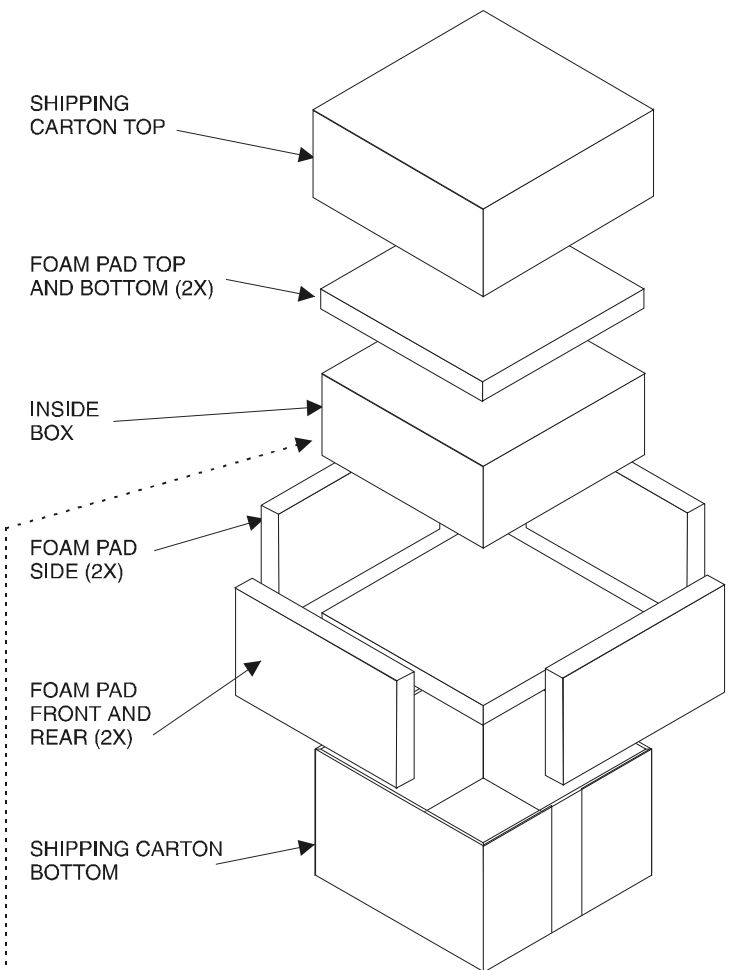
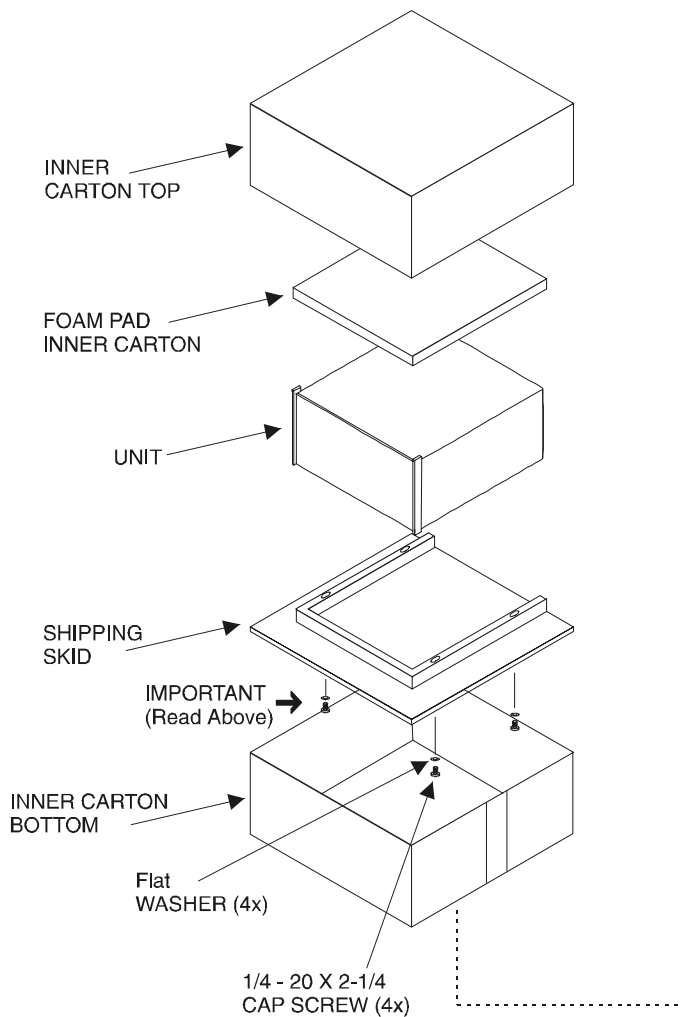
110.5 pounds (50.1kg) net, 143.5 pounds (65.1kg) in shipping carton

**Packing Instructions**

In the event it is necessary to repack the equipment for shipment, the equipment must be packed exactly as shown below. It is very important that the four plastic feet are attached to the bottom of the equipment. Four 1/4 - 20 x 2-1/2 inch screws and washers must be used to fasten the unit securely to the bottom pad and shipping skid. This will ensure the proper equipment location on the bottom pad. Failure to do this will result in shipping damage.

Use the original shipping carton and interior parts only if they are all in good serviceable condition. If a shipping carton or any of the interior part(s) are needed, please call or write Customer Service Department of McIntosh Laboratory. Please see the Part List for the correct part numbers.

Quantity	Part Number	Description
1	034052	Shipping carton top
1	034051	Shipping carton bottom
2	034054	Foam Pad (top and bottom)
2	034186	Foam Pad (front and rear)
2	034187	Foam Pad (sides)
1	034136	Inner carton top
1	034137	Inner carton bottom
1	034188	Foam Pad (inner carton)
1	034008	Bottom pad
1	034226	Shipping skid
4	101212	1/4 - 20x2-1/4 cap screw
4	104058	Flat washer





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