

MCC301M Power Amplifier



MCC301M

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 bottom cover. 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. Disconnect this equipment when unused for long periods of time.
7. Only use attachments/accessories specified by the manufacturer.

Installation:

8. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
9. Do not install near any heat sources such as radiators, heat ducts or other equipment that produce heat.
10. Do not use this equipment near water.
11. Do not expose this equipment to dripping or splashing and ensure that no objects filled with liquids are placed on the equipment.
12. Do not mount this product with an unstable bracket as the equipment may fall, causing serious injury to a person, and serious damage to the product.

Connection:

13. Route DC power cords so that they are not likely to be pinched by items placed upon or against them, paying particular attention to the point where they enter the instrument.

Care of Equipment:

14. Clean only with dry cloth.
15. Do not permit objects or liquids of any kind to be pushed, spilled and/or fall into the equipment through enclosure openings.

Repair of Equipment:

16. 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.
17. Do not attempt to service beyond that described in the operating instructions. All other service should be referred to qualified service personnel.
18. 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.
19. 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 MCC301M 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 Repair department. For assistance on factory repair return procedure, contact the McIntosh Repair Department at:

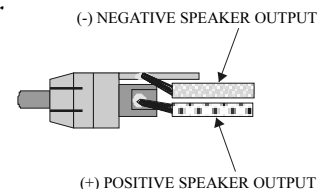
McIntosh Laboratory, Inc.
2 Chambers Street
Binghamton, New York 13903
Phone: 607-723-3515
Fax: 607-723-1917

Table of Contents

| | |
|---|----|
| Safety Instructions | 2 |
| Thank You | 3 |
| Please Take a Moment | 3 |
| Customer Service | 3 |
| Table of Contents | 3 |
| Introduction | 4 |
| Performance Features | 4 |
| Dimensions | 5 |
| Installation | 6 |
| Side Panel Cooling and Connections | 7 |
| How to Connect for Subwoofer | 8 |
| How to Connect for Full Range | 9 |
| Top Panel Controls, Displays and Switches | 10 |
| How to Operate | 11 |
| How to Replace the Fuses | 12 |
| Block Diagram | 13 |
| Specifications | 14 |
| Packing Instruction | 15 |

General Notes

1. An optional McIntosh External Subwoofer Rotary Control, Model Number R1163, is available from your McIntosh Dealer.
2. Do not connect the Amplifier's Speaker Negative Terminal Connection directly to the Vehicle Chassis. Failure to observe this could result in damage to your Amplifier.
3. It is advisable to place an inline fuse as close as possible to the battery.
4. For additional connection information, refer to the owner's manual(s) for any component(s) connected to the MCC301M Amplifier.
5. There is a built-in turn on delay which will mute the speaker output for approximately two seconds when the amplifier is turned on.
6. It is very important that loudspeaker cables of adequate size be used in your music system, to ensure that there will be no power loss or heating. If your loudspeaker cables are 25 feet (7.62m) or less, use at least 16 Gauge wire size or larger.
7. The MCC301M Line Level OUTPUT is wired as a “Y” connection with the INPUT to pass the input signals on to additional amplifiers (keep cable lengths as short as possible). The McIntosh MX406 Control Center is capable of driving several additional power amplifiers with no degradation of the signal.
8. The MCC301M can accept speaker level inputs at its Input Jacks. Refer to the diagram for



Introduction

Now you can take advantage of traditional McIntosh standards of excellence in the MCC301M Power Amplifier. A 300 watt high current output will drive any high quality loudspeaker to its ultimate performance. The MCC301M reproduction is sonically transparent and absolutely accurate. The McIntosh Sound is “The Sound of the Music Itself.”

Performance Features

• Power Output

The MCC301M consists of a power amplifier capable of 300 watts into 4 ohm speakers with less than 0.005% distortion.

• High Current Output

A peak output current of 50 amperes ensures that the MCC301M will successfully drive high quality loudspeakers, such as McIntosh, for a truly exciting sound experience.

• Equalizer and Variable Crossover Filters

The one band equalizer has a center frequency that is variable from 40 Hz to 2,000 Hz which can be either cut or boosted ± 12 db. 24dB per octave low pass filter with variable corner frequencies from 40Hz to 120Hz.

• Subsonic Filter

The selectable frequency Subsonic Filter prevents the amplifier circuitry from amplifying non audible signals and thus wasting amplifier power.

• Power Guard and Sentry Monitor

The Patented McIntosh Power Guard Circuit prevents the amplifier from being overdriven into clipping with its harsh distorted sound that can also damage your valuable loudspeakers. McIntosh Sentry Monitor power output stage protection circuit is present to ensure the MCC301M will have a long and trouble free operating life.

• Speaker Protection

If for any reason, a DC (Direct Current) voltage appears at the speaker output terminals, a built-in circuit turns off the amplifier power supplies to prevent damage to your valuable loudspeakers.

• Thermal Protection with Multi-Speed Cooling Fans

Built-in thermal protection circuits guard against overheating which could shorten the normal long life expectancy of your McIntosh Power Amplifier. Cooling fan speed is controlled by temperature sensors attached to the interior of the extruded aluminum cooling tunnel. The fans are normally off. When needed, the fans will automatically switch on, and speed is increased as needed for additional cooling.

• Fully Discrete Design

The MCC301M has a fully complimentary double balanced amplifier design and is identical to that found in McIntosh's leading home amplifiers.

• Balanced Inputs with Pass Through

The Balanced Inputs cancel out interference noise that is produced by other sources in the vehicle and can be directly connected to the bridged speaker output of any head unit. The MCC301M provides two line level outputs, for the convenience of connecting multi-amplifier systems.

• Illuminated Power Meter

The Illuminated Power Output Watt Meter on the MCC301M is peak responding and almost ten times faster than a professional VU meter. It also indicates the true power output of the amplifier regardless of the loudspeaker impedance, as both the voltage and current are measured.

• Remote Subwoofer Control and Line Output

The subwoofer level can be controlled via an optional external rotary control, which can be remotely mounted in the vehicle. A line level output is provided to drive an external subwoofer power amplifier.

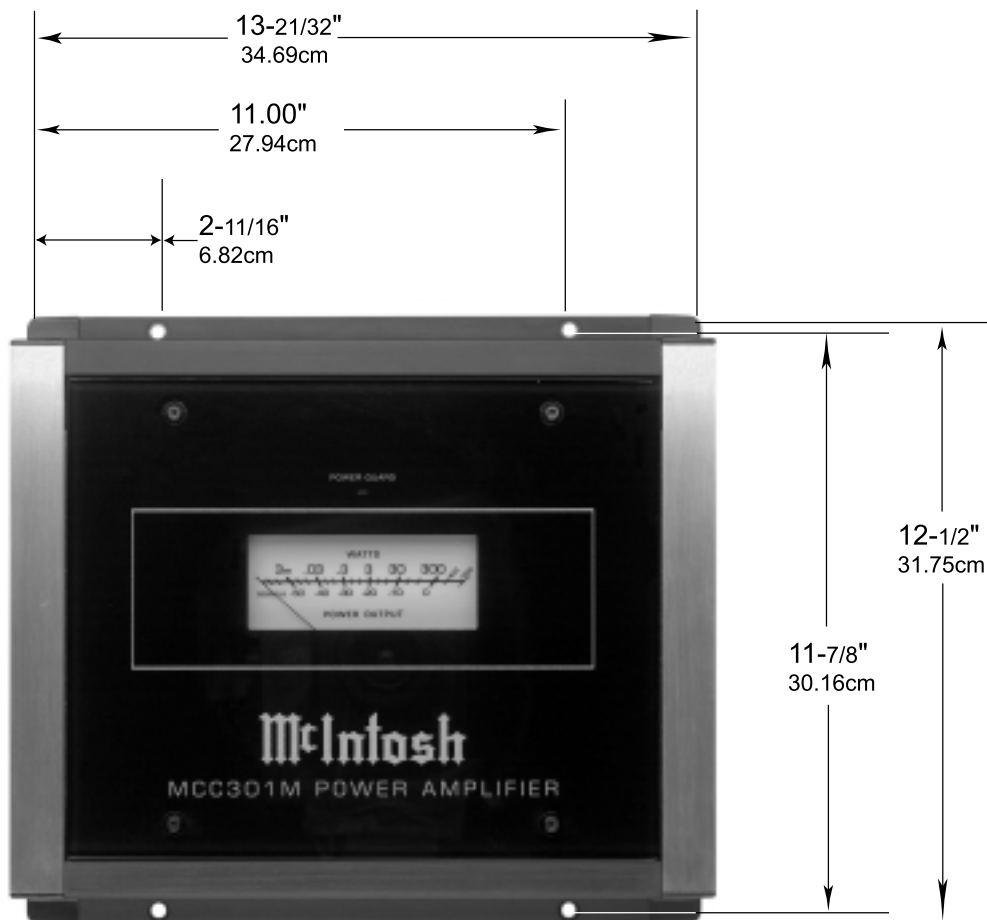
• Gold Plated Terminals

McIntosh provides gold plated input and output terminals on the amplifiers for superior corrosion resistance. It is a very important feature in the automotive environment. Speaker wires to 10 AWG and DC input wires to 4 AWG can be accommodated.

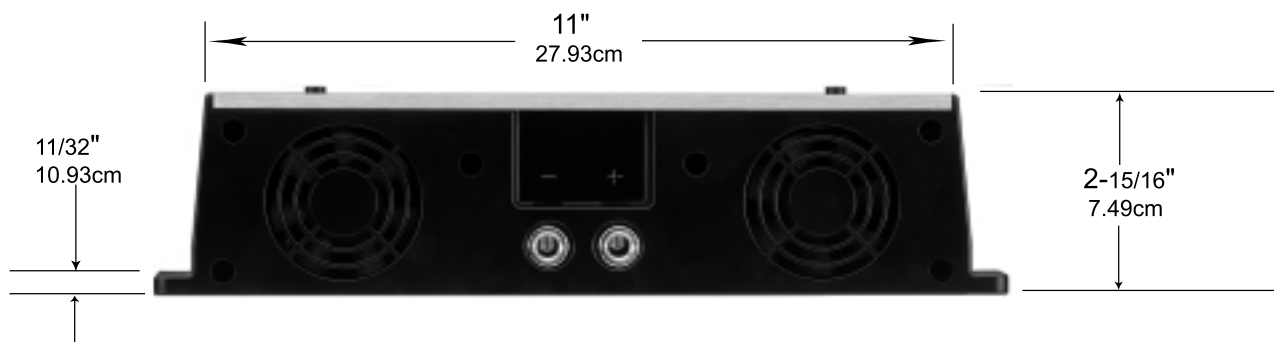
Dimensions

The following dimensions can assist in determining the best location for your MCC301M. There is additional information on the next page pertaining to installing the MCC301M into your vehicle.

Top View of the MCC301M



Side View of the MCC301M



Installation

It is recommended that a professional who is skilled in all aspects of installation and operation install the MCC301M and any associated mobile audio equipment.

Amplifier Ventilation

Always provide adequate ventilation for the MCC301M. The amplifier requires an adequate airflow into the cooling fans, which are located on the left side of the amplifier. The warm air exits the amplifier through vents on the heatsinks. See figure 1. Be sure to provide at least 1-1/2 inches clearance in front of the cooling fans and 1 inch clearance at the sides of the heatsinks.

The cooling fans are controlled by temperature sensors, attached to the interior of the tunnel. The fans are normally off. If the program material contains sustained loud passages demanding high power, the fans will turn-on to increase cooling. If cooling is still not sufficient, additional heating will shut down the amplifier's internal power supply completely and the Power Guard LED will light. The fans will continue to run and once normal temperatures are restored, operation will resume.

The amplifier can be mounted vertically or horizontally and may be located under a seat if adequate clearance is available. The preferred installation method is to mount the amplifier directly to the vehicle frame using the hardware supplied with the amplifier.

It is not recommended that the amplifier be mounted under the hood or in a location where it will be directly exposed to the elements. The openings in the fan housings and heat tunnel vents can allow internal components to be damaged by exposure to water, chemicals or any form of road dust or debris.

Removing the Glass Panel

To access the MCC301M Controls, remove the glass panel by removing the four hex bolts with the supplied 3/32" hex key. See figure 2. Attach the supplied suction cup to the top center of the glass panel and carefully raise it high enough to put your hand under. Temporarily place the removed glass panel in a safe place, remove the suction cup and save it for future use.

Removing the End Caps

To access the MCC301M Connecting Terminal Block, remove the Glass Panel first (the above step) and then remove the Phillips Screws holding the End Caps on both sides of the amplifier and lift the end caps off. See figure 3.

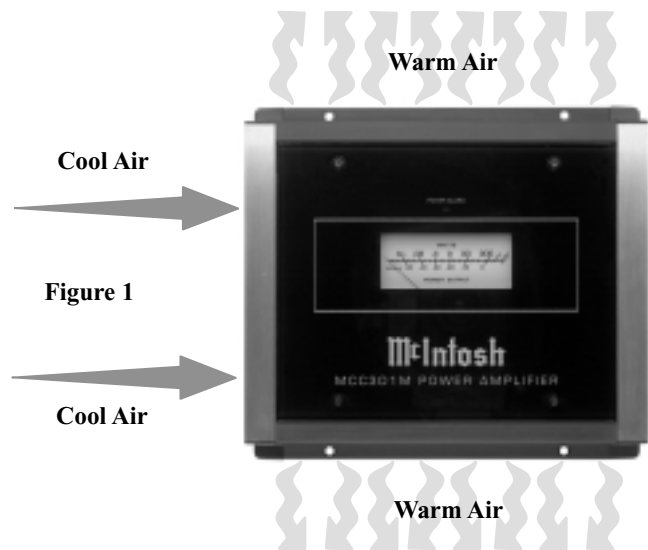


Figure 1

Cool Air

Cool Air

Figure 2

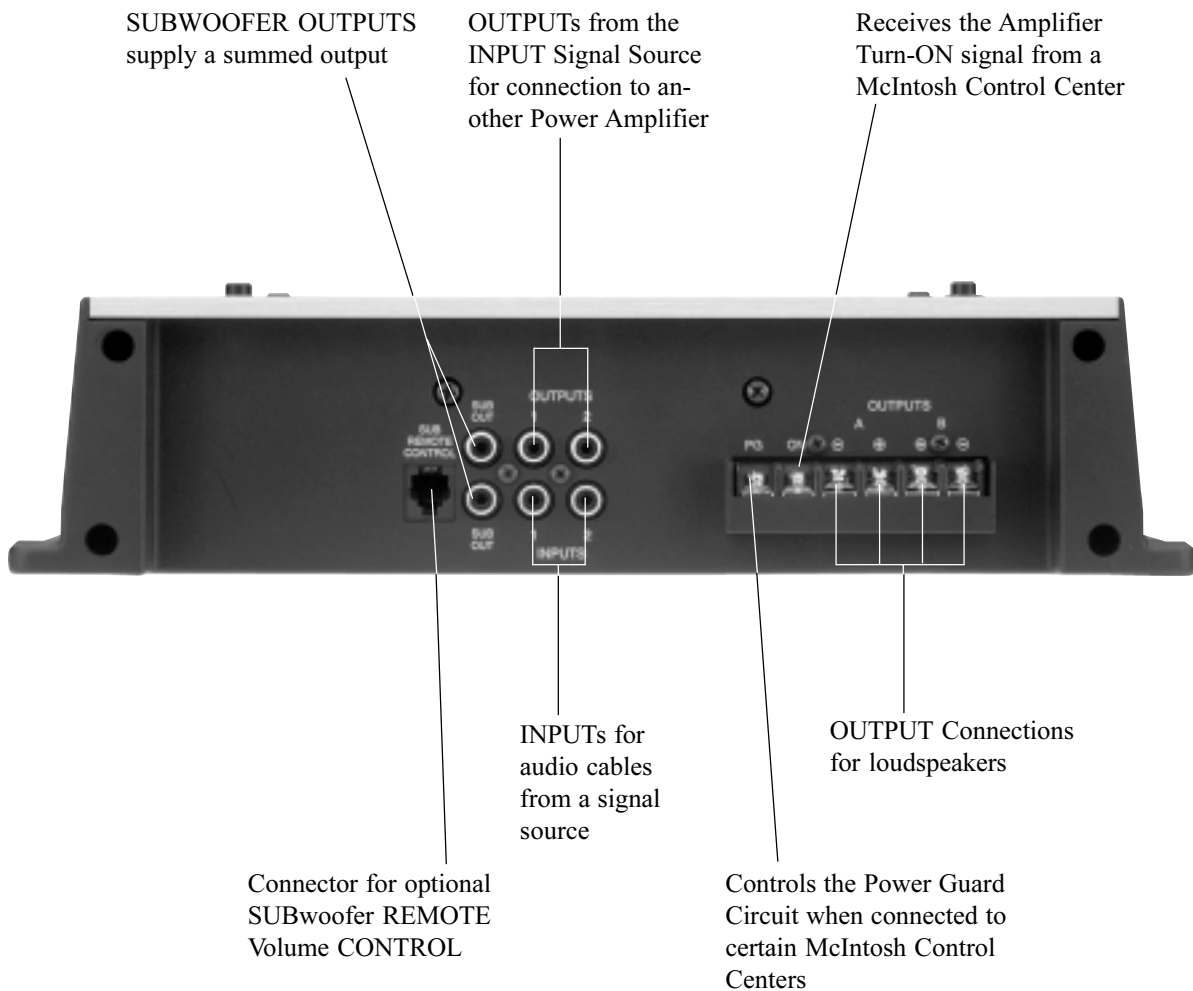
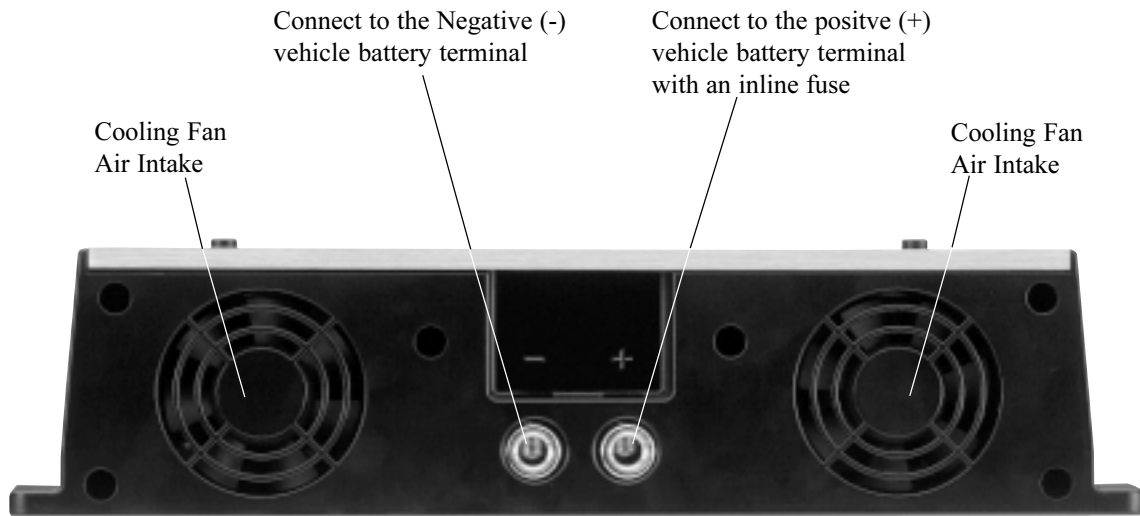


Remove End Cap Screws

Figure 3



Side Panel Cooling and Connections



How to Connect for Subwoofer

There are many different possible Vehicle Audio System combinations utilizing the MCC301M Power Amplifier. It is recommended that a professional who is skilled in all aspects of Vehicle Audio Systems assist you in the selection and installation. The illustration below is just one of the many possible combinations.

1. Connect a wire from the Control Center Amp On to the MCC301M ON Connector on the right side of the amplifier.

Note: All cables should be connected to the amplifier before connecting the DC power cables to the battery.

2. Connect cables (up to 12AWG) from two loudspeakers connected to the Amplifier's A and B OUTPUT Terminals, being careful to observe the correct polarities.

Note: The A and B OUTPUT Terminals are in parallel; either A, B, or both Terminals may be connected.

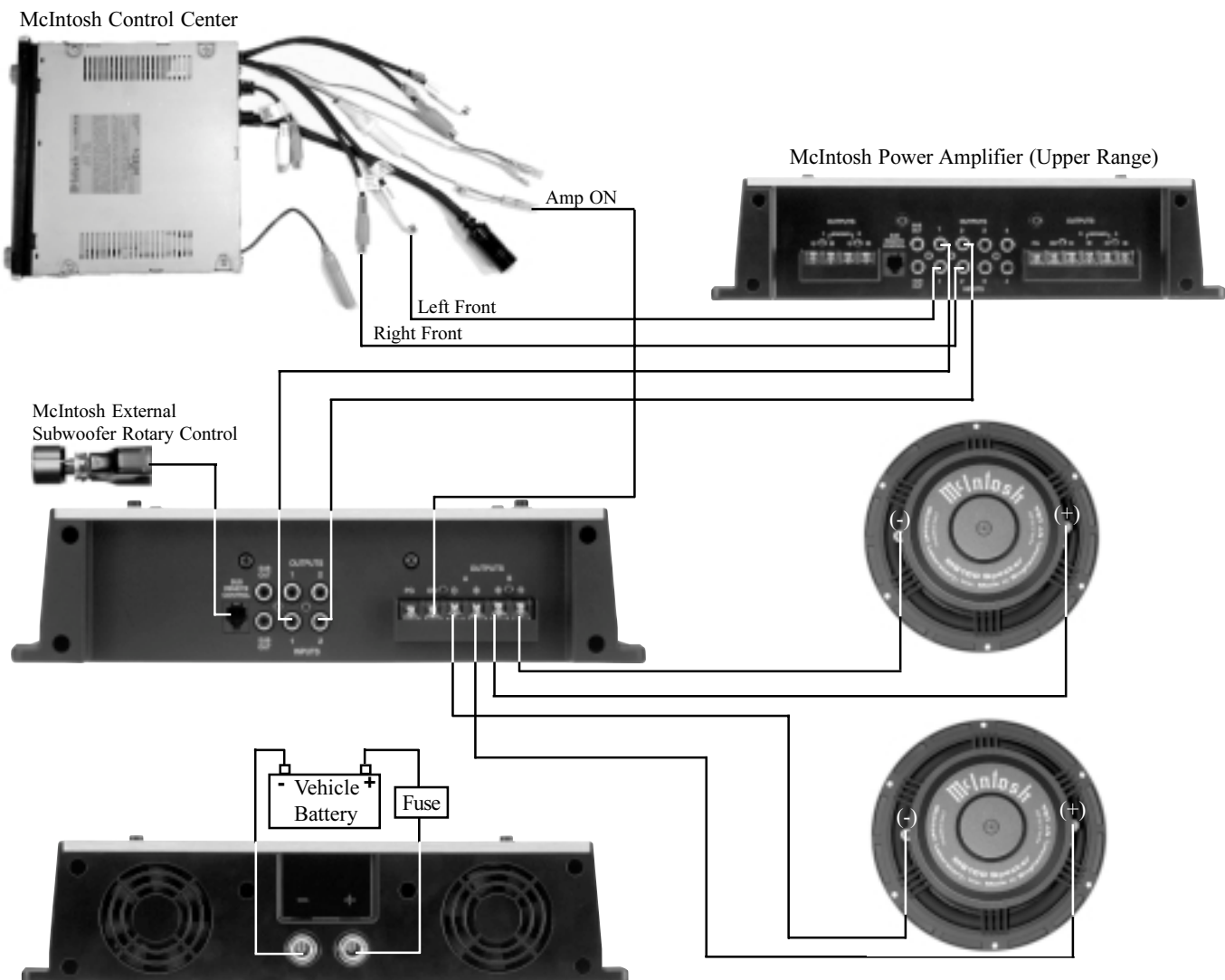
3. Connect audio cables from the Control Center Outputs to the McIntosh Power Amplifier (Upper Range) Inputs 1 and 2.

4. Connect audio cables from the McIntosh Power Amplifier (Upper Range) Outputs 1 and 2 to the MCC301M Inputs 1 and 2.

Note: The Subwoofer Output is summed from both of the Inputs Jacks and can be remotely controlled by connecting a cable from the SUB REMOTE CONTROL jack to the Optional External Rotary Control.

5. Connect the MCC301M to the vehicle battery terminals using size 4AWG (maximum) cables.

Note: It is advisable to place an inline fuse of a suitable size as close as possible to the battery.



How to Connect for Full Range

There are many different possible Vehicle Audio System combinations utilizing the MCC301M Power Amplifier. It is recommended that a professional who is skilled in all aspects of Vehicle Audio Systems assist you in the selection and installation. The illustration below is just one of the many possible combinations.

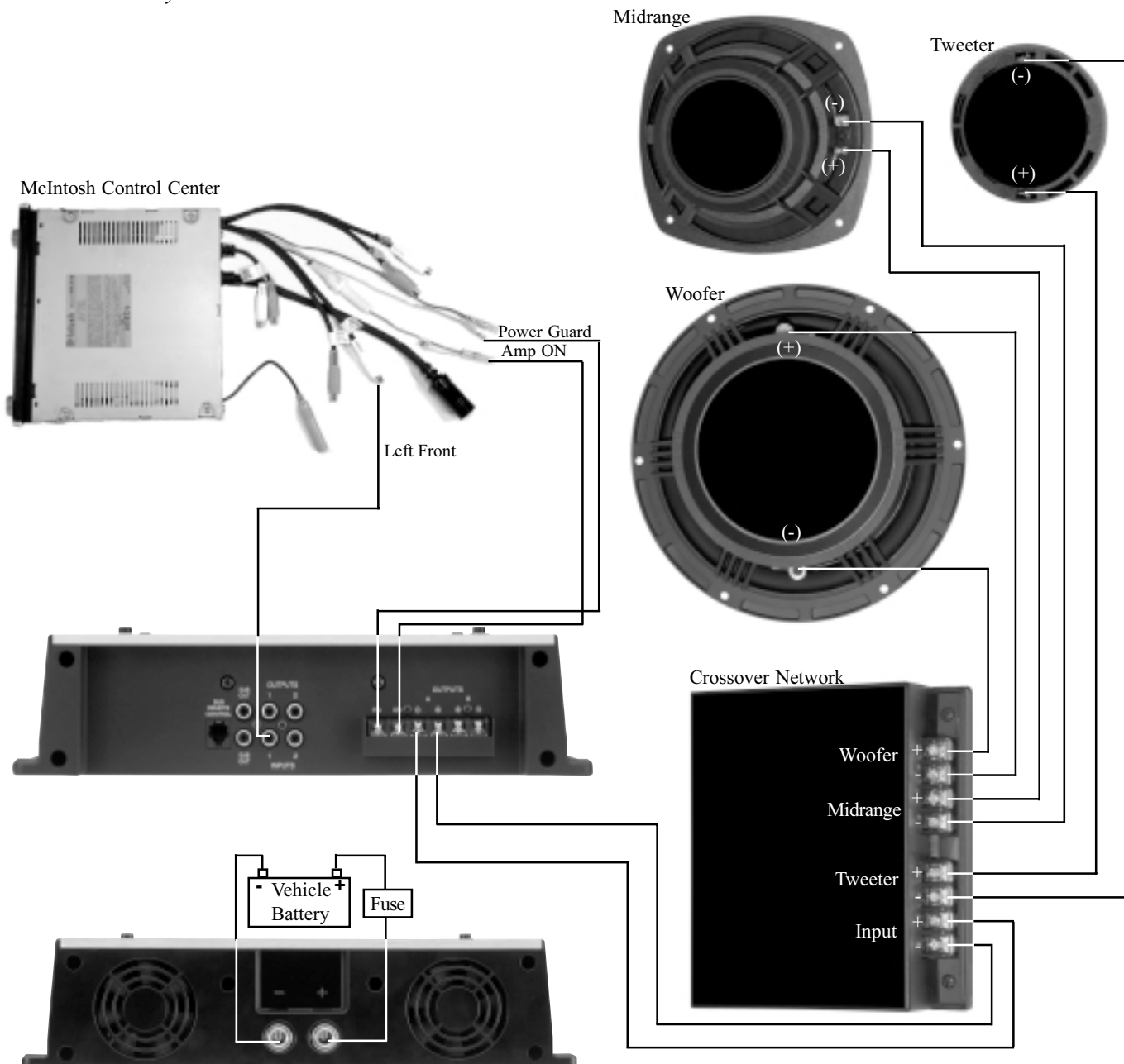
Note: In a typical installation a second MCC301M would be needed for the Right Channel.

1. Connect a wire from the Control Center Amp On to the MCC301M ON Connector on the right side of the amplifier.

Note: All cables should be connected to the amplifier before connecting the DC power cables to the battery.

2. Connect a wire from a McIntosh Control Center with Power Guard to the MCC301M PG Connector on the right side of the amplifier.
3. Connect a cable (up to 12AWG) from the loudspeaker system connected to the Amplifier's A OUTPUT Terminals, being careful to observe the correct polarities.
4. Connect an audio cable from the Control Center Left Channel Output to the McIntosh Power Amplifier Input 1.
5. Connect the MCC301M to the vehicle battery terminals using size 4AWG (maximum) cables.

Note: It is advisable to place an inline fuse of a suitable size as close as possible to the battery.



LOW PASS FILTER FREQUENCY
Control selects the Low Frequency Roll-Off

POWER GUARD
LED lights when the Power Guard Circuit activates

SENSITIVITY
Input Sensitivity Control

LOW PASS FILTER
Switch activates the filter

SUBSONIC FILTER
Switch selects the low frequency roll-off below 20Hz or 28Hz; or flat frequency response

EQUALIZER Controls
select the FREQUENCY and the LEVEL of Boost or Cut at the Center Frequencies

SOURCE Switch selects either Input 1, or 1 - 2 SUBwoofer (Sum of Inputs 1 and 2)



METER indicates the actual Power Output

Introduction

The McIntosh MCC301M is a highly versatile amplifier that can be configured in many ways. This manual gives examples of some of the most common configuration. The best way to set equalization and filter controls is through the use of a real-time spectrum analyzer and the expertise of a professional installer. This manual will guide you through the basic operation, however we suggest you refer to your dealer for further information on the use of this unit. To access the Amplifier Controls and Switches refer to "Removing the Glass Panel" located on page 6 of this Owner's Manual.

Power

The MCC301M will turn On or Off when the Control Center turns On or Off.

Note: There must be an Amp ON connection between the MCC301M and the signal source unit in order for the amplifier power turn On and Off to function.

Low Pass Filter

The LOW PASS FILTER Switch OUT Position selects a Flat Frequency Response. When the LOW PASS FILTER Switch is in the IN (low frequency pass) Position, the Amplifier will pass all frequencies below the setting of the LOW PASS FILTER FREQUENCY Control. Refer to figure 4.



Figure 4

Subsonic Filter

The SUBSONIC FILTER Switch OUT Position selects a Flat Frequency Response. When the SUBSONIC FILTER Switch is in the 20Hz Position, the Amplifier will pass all frequencies above 20Hz. In a similar fashion selecting the 28Hz position, the Amplifier will pass all frequencies above 28Hz. Refer to figure 5.



Figure 5

Equalizer

The MCC301M Power Amplifier is equipped with an equalizer. The equalizer is not intended to act as a tone control. The one-band equalizer is best utilized as a notch filter to reduce a peak (as located by real-time analysis with an RTA) in your system's frequency response. If you are attempting to equalize a system without RTA data, play

music you are familiar with, set the equalizer LEVEL Control to +12 and slowly turn the FREQUENCY Control to get an idea where in the musical spectrum the frequency numbers are located. Then set the LEVEL Control back to 0 and listen to the system to determine its equalization needs. Subtle adjustments are best and cutting usually sounds better than boosting. Refer to figure 6.



Figure 6

Input Sensitivity Control and Source Switch

The SENSITIVITY Control allows the setting of the input sensitivity to provide an ideal match for the signal source being used. The most desirable setting allows the control center to have a useful volume range as wide as possible from loud to soft. A good place to start is to set the amplifier's SENSITIVITY Control to the output voltage called out in your control center owner's manual. The Level controls can be set for any sensitivity from .5 volts to 8 volts.



Figure 7

The SOURCE Switch allows selection of the Input Signal from either the INPUT 1 Jack or both INPUT 1 and 2 Jacks. In the 1-2 SUB position, the optional Subwoofer Remote Control can be used to control the volume. Refer to figure 7.

How to Replace the Fuses

If the MCC301M produces no sound, there is no illumination of the Meter on the Top Glass Panel, and the power connections seem secure, one or more of the Amplifier's Fuse(s) may have failed. Under normal operating conditions your amplifier's fuses should not fail. Failure of a fuse is usually an indication of a problem. Replacing the fuse, if there is problem in the amplifier, may incur a risk of further damage. Refer to figures 8, 9 and 10.

Caution: *Disconnect the Amplifier from the Vehicle Battery (or DC Power Supply) as Potentially Dangerous Currents exist inside the amplifier.*

1. Before accessing fuses, disconnect both the positive and negative power cables from the DC input terminals on the left side of the amplifier using a 5/32" hex key.
2. Remove the Top Glass Panel by first removing the four hex bolts with the supplied 3/32" hex key.
3. To remove the Top Glass Panel, attach the supplied suction cup to the top center of the glass panel and carefully raise it high enough to put your hand under. Temporarily place the removed glass panel in a safe place, remove the suction cup and save it for future use.
4. Remove the Phillips Screws holding the End Caps on both sides of the amplifier and lift the end caps off.
5. Remove the two Phillips Screws, one is located above the row of Controls/Switches and the other near the Bottom Edge of the Gold Faceplate Control Panel.
6. Remove all 5 crossover, equalizer and sensitivity knobs.
7. Remove the Gold Faceplate Control Panel.
8. Remove the fuses with needle nose pliers, taking care to avoid hitting parts on the circuit board.

Note: To determine if the fuse has failed, examine the link between the two fuse legs to see if it has a break in it.

9. Replace the fuse with one of the same type and rating, as unauthorized substitutions may prove hazardous to you and the amplifier.
 10. When reinserting the fuse, set it in place with the pliers, then push it the rest of the way in with your finger to avoid having the pliers slip and hit the circuit board.
 11. Re-install the Gold Faceplate Control Panel and all 4 equalizer and sensitivity knobs.
 12. Re-connect the power cables to the vehicle battery.
- If the replacement fuse(s) fails again, have the amplifier repaired at a McIntosh Service Center.

Figure 8

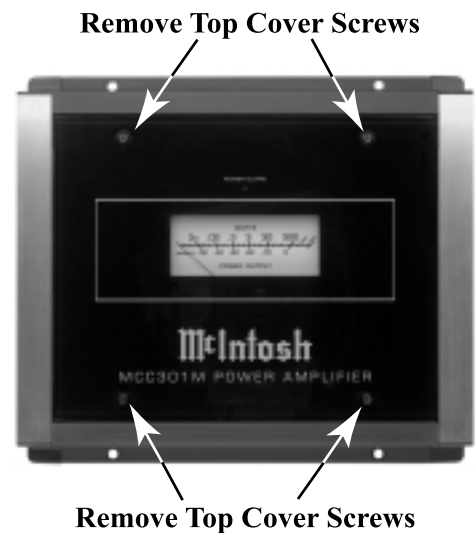
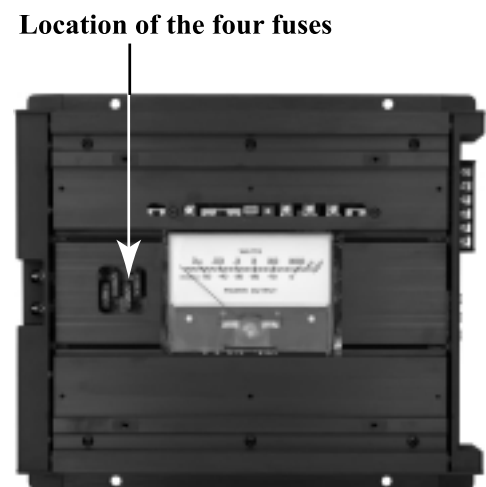


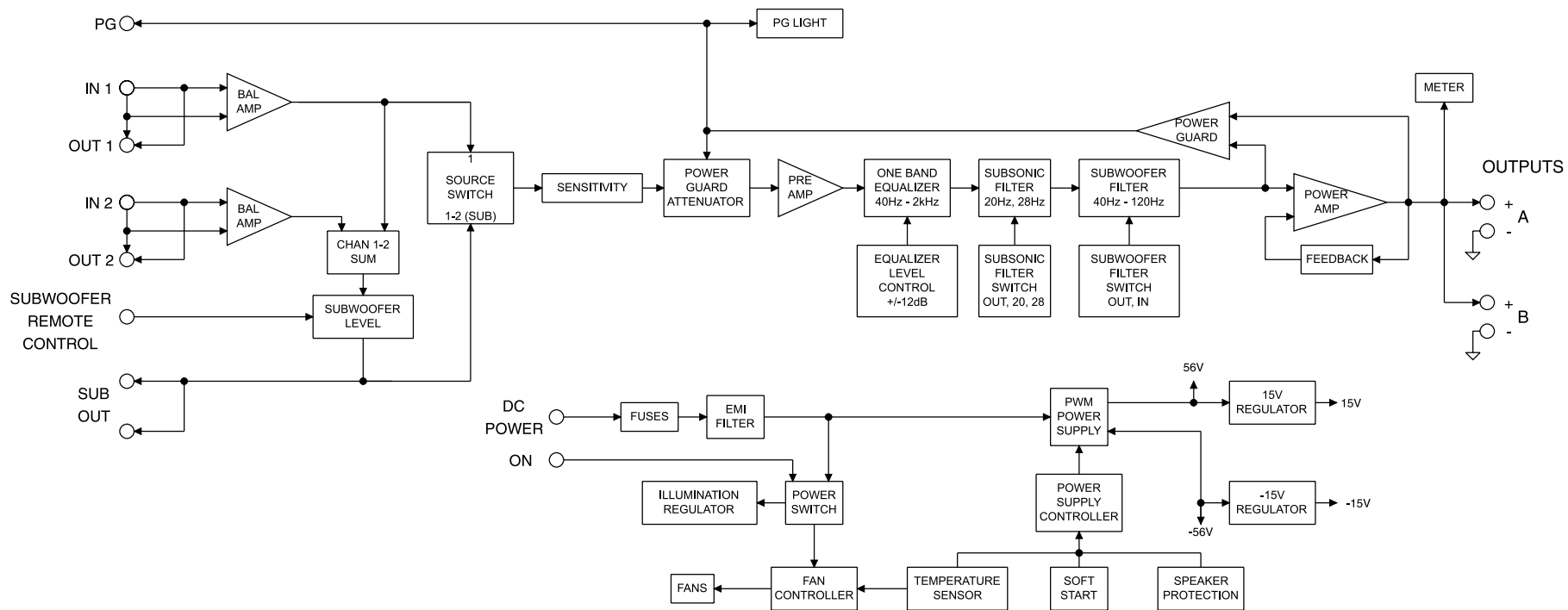
Figure 9



Figure 10



MCC301M Block Diagram



Specifications

Power Output

300 watts into 4 ohm loads and 600 watts into 2 ohm loads is the minimum sine wave continuous average power output

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% for a 2 or 4 ohm load

Dynamic Headroom

1dB

Frequency Response

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

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

Sensitivity

0.5 Volts

A-Weighted Signal To Noise Ratio

105dB (1.5V)

One Band Equalizer

Center Frequency is variable from 40Hz to 2,000Hz, level variable ± 12 db, Q fixed at 2

Subsonic Filter

Selectable 20Hz or 28Hz (the slope is 18dB per octave)

Low Pass Filter

Adjustable from 40Hz to 120Hz with a slope of 24dB per octave

Subwoofer Output

Low Pass filtered at 200Hz with a 6dB per octave slope (level variable ± 12 dB when using optional McIntosh External Subwoofer Rotary Control)

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% for a 2 or 4 ohm load

Input Impedance

12,000 ohms

Power Requirements

12 Volts DC, 2.5 amps (idle) - 50 amps (300 watts)

Dimensions

12.5 inches (31.8cm) wide, 3.0 inches (7.6cm)

high, 13.7 inches (34.8cm) depth

Weight

14.7 pounds (6.7Kg) net, 17.5 pounds (7.9Kg) in shipping carton

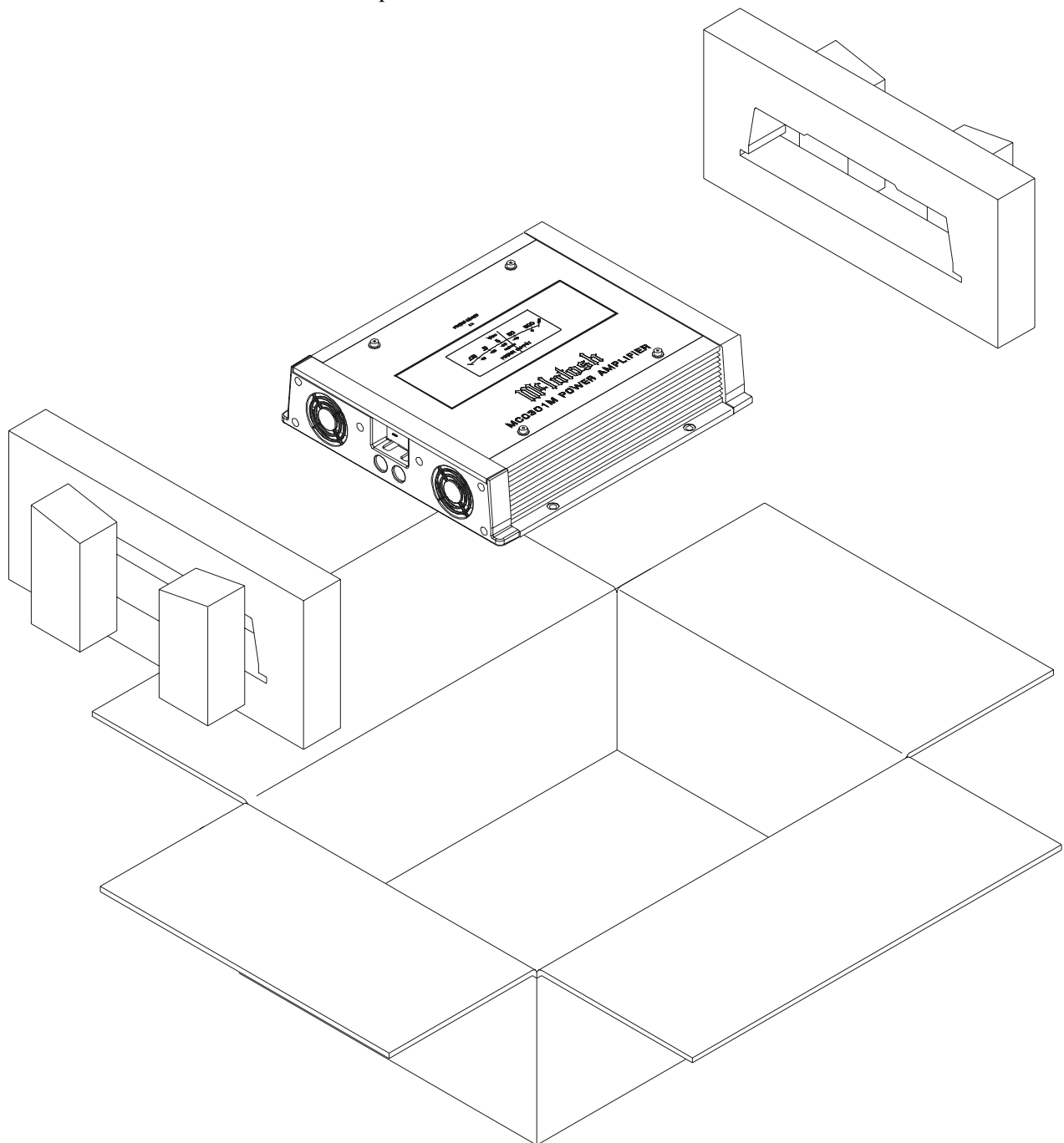
Packing Instructions

In the event it is necessary to repack the equipment for shipment, the equipment must be packed exactly as shown below, failure to do so will result in shipping damage.

Make sure that the Top Glass Panel is firmly secured to the chassis using the supplied hex head screws.

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.

| <u>Quantity</u> | <u>Part Number</u> | <u>Description</u> |
|-----------------|--------------------|----------------------|
| 1 | 034162 | Shipping carton only |
| 2 | 034132 | End cap (Foam pad) |



McIntosh[®]

McIntosh Laboratory, Inc.
2 Chambers Street
Binghamton, NY 13903

McIntosh Part No. 040764

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