

McIntosh[®]
OWNER'S MANUAL

**MC1000
POWER
AMPLIFIER**



OWEN'S MANUAL



**MC1000
POWER
AMPLIFIER**

**IMPORTANT
SAFETY
INSTRUCTIONS**

**THESE
INSTRUCTIONS
ARE TO PROTECT
YOU AND THE
McINTOSH
INSTRUMENT.
BE SURE TO
FAMILIARIZE
YOURSELF
WITH THEM**

1. Read all instructions - Read the safety and operating instructions before operating the instrument.
2. Retain Instructions - Retain the safety and operating instructions for future reference.
3. Heed warnings - Adhere to warnings and operating instructions.
4. Follow Instructions - Follow all operating and use instructions.

WARNING: to reduce risk of fire or electrical shock, do not expose this instrument TO RAIN OR MOISTURE.

5. Power Sources - Connect the power supply only to the type described in the operating instructions or as marked on the unit.
6. Power-Cord Protection - Route power-supply cords so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the instrument.
7. Ventilation - Locate the instrument for proper ventilation. For example, the instrument should not be placed on a bed, sofa, rug, or similar surface that may block ventilation openings; or, placed in a built-in installation, such as a bookcase or cabinet, that may impede the flow of air through the ventilation openings.
8. Heat - Locate the instrument away from heat sources such as radiators, heat registers, stoves, or other appliance (including amplifiers) that produce heat.
9. Wall or Cabinet Mounting - Mount the instrument in a wall or cabinet only as described in the owner's manual.
10. Water and Moisture - Do not use the instrument near water - for example, near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool, etc.
11. Cleaning - Clean the instrument by dusting with a dry cloth. Clean the panel with a cloth moistened with a window cleaner.
12. Object and Liquid Entry - Do not permit objects to fall and liquids to spill into the instrument through enclosure openings.
13. Nonuse Periods - Unplug the power cord from the AC power outlet when left unused for a long period of time.
14. Damage Requiring Service **Service must be performed by qualified service personnel when:**
 - A. The power supply cord or the plug has been damaged; or
 - B. Objects have fallen, or liquid has been spilled into the instrument; or
 - C. The instrument has been exposed to rain; or
 - D. The instrument does not appear to operate normally or exhibits a marked change in performance; or
 - E. The instrument has been dropped, or the enclosure damaged.
15. Servicing - Do not attempt to service beyond that described in the operating instructions. All other service should be referred to qualified service personnel.
16. Grounding or Polarization - Do not defeat the inherent design features of the polarized plug. Non-polarized line cord adaptors will defeat the safety provided by the polarized AC plug.

17. 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 prevenir les chocs electriques pas utiliser cette FICHE POLARISEE AVEC UN PROLONGATEUR, UNE PRISE DE COURANT OU UNE AUTRE SORTIE DE COURANT, SAUF SI LES LAMES PEUVENT ETRE INSEREES A FOND SANS EN LAISSER AUCUNE PARTIE A DECOUVERT.



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.



CAUTION: to prevent the risk of electric shock, do not REMOVE COVER (OR BACK). NO USER-SERVICABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED PERSONNEL.



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: 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.

Your decision to own this piece of McIntosh Stereo Equipment 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 thousands of hours 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 piece of McIntosh. This will ensure that you receive all the performance benefits this instrument can offer you, and that it will become a highly valued part of your home music system.

The serial number, purchase date, and McIntosh Laboratory Service Contract number are important to you for possible insurance claim or future service. Record this information here.

Serial Number	Purchase Date
Service Contract Number	

Upon application, McIntosh Laboratory provides a Service Contract to the original purchaser. Your McIntosh Authorized Service Agency can expedite repairs when you provide the Service Contract with the instrument for repair.

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THANK YOU

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TAKE ADVANTAGE OF 3 YEARS OF CONTRACT SERVICE. . .
FILL IN THE APPLICATION NOW.

Your MC1000 Power Amplifier will give you many years of satisfactory performance. If you have any questions, please contact,

McIntosh Laboratory Inc.

2 Chambers Street
Binghamton, New York 13903-2699
Phone: 607-723-3512

**McINTOSH
THREE YEAR
SERVICE
CONTRACT**

An application for A THREE YEAR SERVICE CONTRACT is included with this manual.
The terms of the contract are:

1. If the instrument covered by this contract becomes defective, McIntosh will provide all parts, materials, and labor needed to return the measured performance of the instrument to the original performance limits free of any charge. The service contract does not cover any shipping costs to and from the authorized service agency or the factory.
2. Any McIntosh authorized service agency will repair all McIntosh instruments at normal service rates. To receive the free service under the terms of the service contract, the service contract certificate must accompany the instrument when taken to the service agency.
3. Always have service done by a McIntosh authorized service agency. *If the instrument is modified or damaged as a result of unauthorized repair the service contract will be cancelled.* Damage by improper use or mishandling is not covered by the service contract.
4. The service contract is issued to you as the original purchaser. To protect you from misrepresentation this contract cannot be transferred to a second owner.
5. Units in operation outside the United States and Canada are not covered by the McIntosh Factory Service Contract, irrespective of the place of purchase. Nor are units acquired outside the USA and Canada, the purchasers of which should consult with their dealer to ascertain what, if any, service contract or warranty may be available locally.

NEW REFERENCE STANDARD FOR POWER AMPLIFIERS

McIntosh Laboratory, the company who introduced in 1949 the world's first amplifier that could be called "High Fidelity", has created a new power amplifier without compromise. It is the Model MC1000. All the most advanced circuit design concepts are utilized in this amplifier.

A continuous average power output rating of 1000 watts, and a maximum Peak Current Output of 160 amperes makes this not only the most advanced, but also the most powerful amplifier McIntosh has ever manufactured. The MC1000 has the reserve power capability to deliver more than 4000 watts output, in 20ms tone bursts, into a 1.6 ohm load connected to the amplifier's 8 ohm output. The MC1000 can deliver the best possible performance from any type of loudspeaker system.

The distortion limits for the MC1000 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 MC1000 are so low, it takes special measuring techniques to make accurate readings.

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.

Refer to the TECHNICAL DESCRIPTION section in this manual for detailed information on the circuits of this outstanding power amplifier.

The McIntosh MC1000 Power Amplifier is designed as a free standing unit. It includes large padded mounting feet which allow the amplifier to be placed on a table top, shelf or other similar mounting surface.

Always provide adequate ventilation for the amplifier. The trouble free life of any electronic instrument is greatly extended by providing sufficient ventilation for cool operation. Allow at least 1 1/2 inches (3.8cm) clearance above the heat sink area so airflow is not obstructed.

The recommended minimum depth for mounting, including clearance for connections, is 17-3/4 inches (45.1cm) behind the front panel. The handles extend in front of the panel 2-3/8 inches (6cm).

INTRODUCTION

INSTALLATION

HOW TO CONNECT INPUTS

CONNECTING CABLES

Use High quality connecting cables. Your McIntosh dealer can advise you on the types and lengths of cables that will work best in your installation.

The MC1000 has input facilities for both balanced and unbalanced cables. Use one or the other input, but not both at the same time.

UNBALANCED INPUT

Connect a shielded cable with an RCA type connector, from the output of a preamplifier or similar accessory unit to the UNBALANCED INPUT on the MC1000.

BALANCED INPUT

It is possible for conventional interconnecting cables to pick-up interference from other equipment, AC cables or electrical appliances. This is most likely if your system requires longer cable lengths from the program source to the amplifier input.

When using two MC1000 amplifiers for stereo, each connected to a separate dedicated AC outlet, there is a possibility of a grounding problem that could introduce a small amount of hum into the audio circuit. Using Balanced inputs will eliminate the possibility of hum pick-up. The Balanced inputs provide an additional 40dB of protection against such hum or noise pick-up.

Use a 2 conductor shielded cable with XLR type connectors. Connect a cable from the Balanced preamplifier output to the MC1000 BALANCED INPUT.

Pin configuration for the XLR input connector on the MC1000.

PIN 1: Shield or Ground

PIN 2: + Input

PIN 3: - Input

If a second MC1000 is being used in a normal stereo pair configuration, connect one amplifier for the left channel signal, and the other amplifier for the right channel in a similar manner.

HOW TO CONNECT OUTPUTS

SPEAKER CABLES

Use high quality speaker cables since this is an important link in your stereo system. Selection of the proper size and type of speaker cable is necessary for you to receive the best possible performance from your amplifier and speaker combination. The high power output capability of the MC1000 requires heavy gauge cable to handle the current requirements. A size of 14 gauge or heavier is recommended. Your McIntosh dealer can advise you on the choice of speaker cables that will work best in your installation.

The McIntosh MC1000 incorporates the famous McIntosh designed and manufactured Output Autoformer. The Autoformer insures peak performance and protection, as well as outstanding compatibility between the amplifier and the loudspeaker.

The MC1000 Output Autoformer has three different sets of output impedance connections for optimum matching to the particular speaker or combination of speakers being used. The following table will help you determine which impedance connection would be best for your speaker. It may be desirable to consult your dealer or the manufacturer of your loudspeaker for further information on the correct impedance.

HOW TO CONNECT OUTPUTS

SPEAKER IMPEDANCE IN OHMS	AMPLIFIER OUTPUT CONNECTIONS
1 to 3	+ and - 2 ohm
3 to 6	+ and - 4 ohm
6 and up	+ and - 8 ohm

Use the Power Output Impedance connections that are appropriate for your speaker. If your speaker is rated with a range of impedances, choose the nominal listed impedance for connection.

Connect a cable from the speaker Common terminal to the appropriate MC1000 - (Minus), POWER OUTPUT TERMINAL. Connect another cable to the appropriate + (Plus) POWER OUTPUT TERMINAL.

The MC1000 output is in phase with the input signal. The Plus and Minus outputs of all three impedance connections are balanced electrically with respect to the amplifier chassis ground.

The actual load impedance of some speakers may drop below the specified impedance at certain points in the audio frequency range. This will be no problem. The high current output of the MC1000 will produce the extra current necessary to properly drive the speaker under these conditions.

If the impedance of a speaker system is higher than 8 ohms, no change in the quality of performance will occur. The available power output will simply be slightly less.

When two MC1000 amplifiers are used as a stereo pair, be sure to connect the speakers in an identical manner to each amplifier. This is essential for keeping both speaker systems operating in phase. This means that the driving surfaces of each speaker system will move back and forth together. Most speakers have their hot (+) and minus (-) or common terminals color coded. The HOT terminal is usually marked RED.

IMPORTANT

BE SURE TO REPLACE THE PROTECTIVE SPEAKER POWER OUTPUT TERMINAL COVER AFTER THE SPEAKERS ARE CONNECTED. THE MC1000 CAN DELIVER MORE THAN 90 VOLTS OUTPUT FROM THE 8 OHM TERMINALS, WHICH CAN BE A SHOCK HAZARD.

HOW TO CONNECT AC POWER

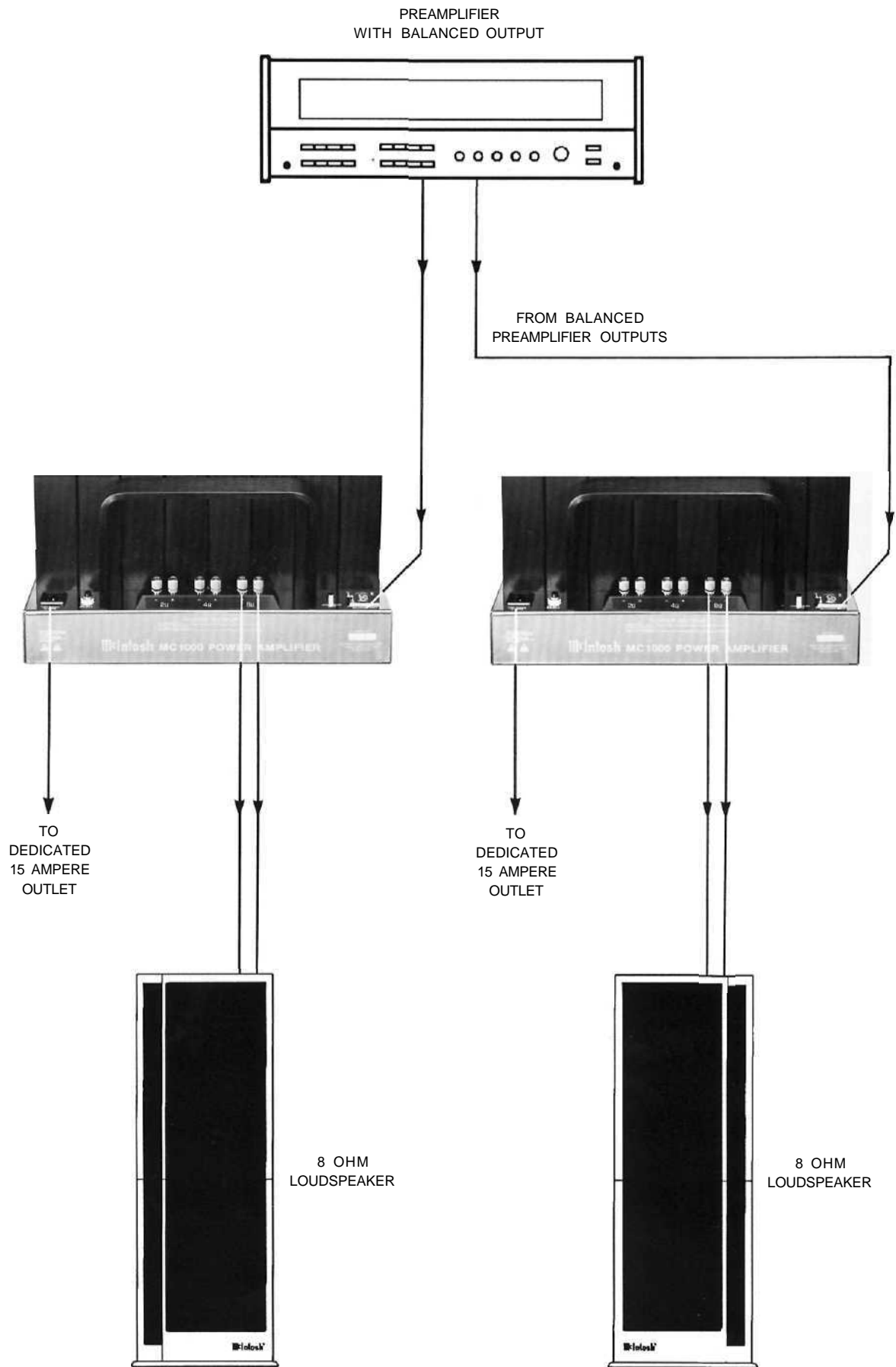
The MC1000 is designed to operate on 120 volts 50/60Hz current. Power consumption is rated at 12 amperes UL/CSA. This current requirement applies for typical music reproduction. The MC1000 will draw greater current with steady tone test signals. Plug the MC1000 AC power cord only into a dedicated AC outlet with a 15 ampere or higher current capacity. If a second MC1000 is used in a stereo system, it must be plugged into a separate dedicated 15 ampere AC outlet.

A built-in circuit breaker protects the internal circuits of the MC1000.

DO NOT PLUG AN MC 1000 POWER CORD INTO THE BACK PANEL AC OUTLET OF A PREAMPLIFIER OR SIMILAR ACCESSORY.

CONNECTING DIAGRAM

TWO MC1000 AMPLIFIERS FOR STEREO



PERFORMANCE LIMITS

POWER OUTPUT

1000 watts into 8, 4 or 2 ohm load is the minimum sine wave continuous average power output.

The output RMS voltage is:

89.4 volts across 8 ohms

63.2 volts across 4 ohms

44.7 volts across 2 ohms

OUTPUT LOAD IMPEDANCE

Terminals for 8, 4 and 2 ohms

RATED POWER BAND

20Hz to 20,000Hz

TOTAL HARMONIC DISTORTION

0.005% maximum harmonic distortion at any power level from 250 milliwatts to rated power output.

DYNAMIC HEADROOM

2.1dB

FREQUENCY RESPONSE

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

+0, -3.0dB from 10Hz to 100,000Hz

INPUT SENSITIVITY

2.5 volts

A-WEIGHTED SIGNAL-TO-NOISE RATIO

Balanced, 90dB (120dB below rated output)

Unbalanced, 85dB (115dB below rated output)

INTERMODULATION DISTORTION, SMPTE

0.005% maximum if instantaneous peak power output does not exceed twice the output rating.

RATINGS

WIDE BAND DAMPING FACTOR

200 at 8 ohm output

INPUT IMPEDANCE

10,000 ohms

POWER GUARD

Clipping is prevented and THD does not exceed 2% with up to 14dB overdrive at 1000Hz.

POWER REQUIREMENTS

120 volts, 50/60HZ, 12 amperes UL/CSA

MECHANICAL

SIZE

17-1/4 inches (43.8cm) wide, by 10-3/8 inches (26.4cm) high, by 20-1/8 inches (51.1cm) deep, including front handles.

FINISH

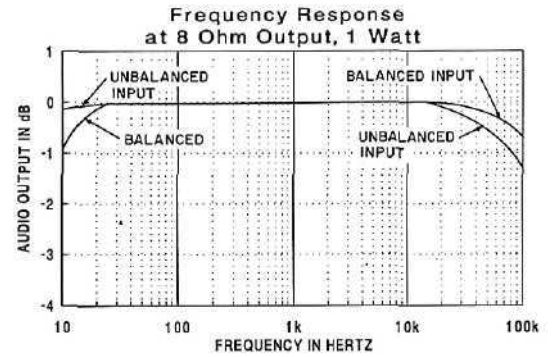
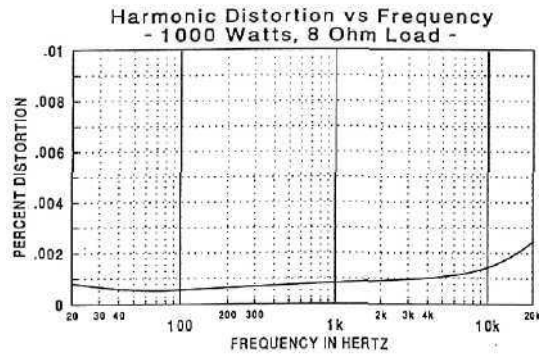
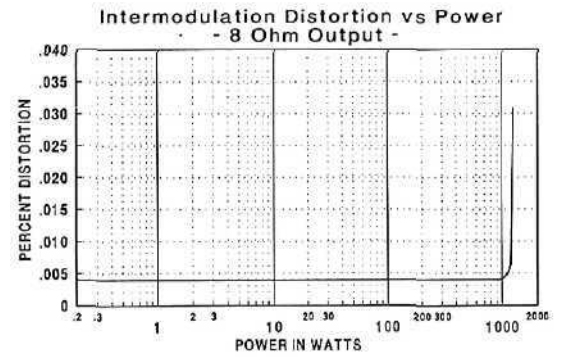
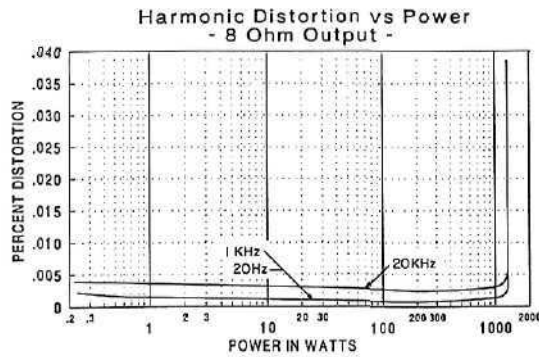
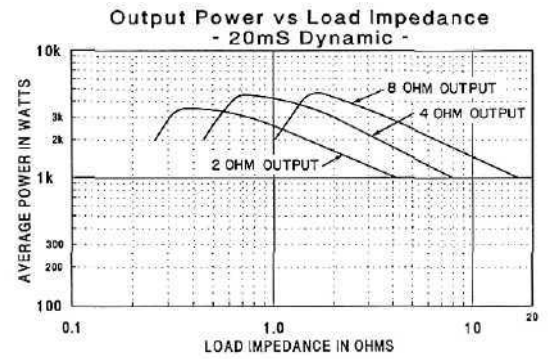
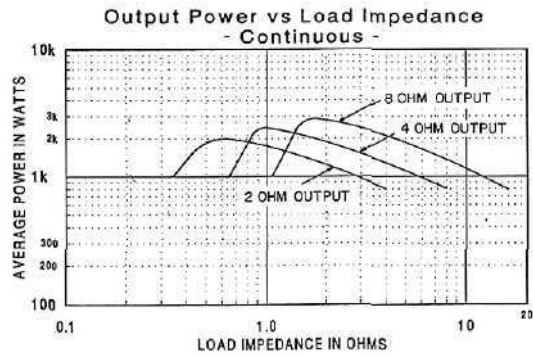
Front panel is glass with gold/teal nomenclature illumination. Handles and side pieces are gold and black anodized aluminum. The chassis is chrome.

WEIGHT

105 pounds (47.7Kg) net; 118 pounds (53.5Kg) in shipping carton.

SPECIFICATIONS

PERFORMANCE CHARTS



DESIGN PHILOSOPHY

The design philosophy incorporated in the MC1000 involved many different techniques, all based on sound scientific logic. Every stage of voltage or current amplification is designed to be as linear as possible. Negative feedback is then utilized to enhance the performance. 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 so called non feedback designs.

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

All transistors are selected to have nearly constant current gain (Beta) 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.

Resistors and capacitors in the signal path are carefully selected to have exceedingly low voltage coefficients, (change of resistance or reactance with applied voltage). Precision metal film resistors, low dielectric absorption film capacitors and premium audio grade electrolytics are used in all critical circuit locations.

PROTECTION CIRCUITS

Some power amplifier manufacturers claim that their products do not need or do not use protection circuits and that such circuits compromise performance. McIntosh feels that protection circuits are desirable and necessary to prevent amplifier or loudspeaker damage due to abnormal circumstances. The genius of McIntosh engineering has resulted in protection circuits which do not effect or compromise the normal performance of a power amplifier.

Six different types of protection circuits are incorporated in the MC1000 to insure it a long, safe and trouble-free operating life. This is just one of the characteristics of McIntosh power amplifiers that has made them world famous. The SENTRY MONITOR circuit is a good example.

SENTRY MONITOR CIRCUIT

All power transistors have limits for the maximum amount of power they can handle. The MC1000 output transistors and power supply have been designed to allow very high current flow into properly matched load impedances. However, if a short circuit or very low load impedance is connected to the MC1000 outputs, destructive current levels could be reached if it was not controlled by the McIntosh SENTRY MONITOR circuit. This circuit senses the dynamic operating time, voltage and current of the output stage, and controls it to safe operating limits. The SENTRY MONITOR circuit does not limit the power output available from the amplifier.

There is absolutely no compromise in sonic performance and it ensures safe operation of the amplifier under even the most extreme operating conditions.

THERMAL CONTROL

All power transistors have limits for the maximum amount of heat they can safely tolerate. The MC1000 uses a highly efficient amplifying circuit which produces relatively little heat from the power transistors for the output power produced. The amplifier uses large area heat sinks with an area of more than 2800 square inches to efficiently dissipate the transistor heat. Natural convection air flow is sufficient for safe cool operation. Cooling fans are not required.

If the cooling air is blocked, or the amplifier operating temperature is forced too high, thermal cutout switches will turn off the AC power to the amplifier. When the problem is corrected

TECHNICAL DESCRIPTION

and the amplifier cools to its normal operating temperature, the AC power will turn back on.

POWER GUARD

The MC1000 includes the unique and patented McIntosh POWER GUARD circuit. POWER GUARD eliminates the possibility of ever overdriving the amplifier into clipping.

Clipping) occurs when an amplifier is overdriven past its output design capabilities. An overdriven amplifier can produce both audible and ultrasonic distortion levels approaching 40%. The audible distortion is certainly unpleasant, but the ultrasonic distortion is also undesirable, since it can damage tweeter loudspeakers.

The POWER GUARD circuit acts as a waveform comparator, monitoring both the input and output signal waveforms. Under normal operating conditions there are no differences between these waveforms. When an amplifier is overdriven beyond its maximum distortion free output, there will be a difference between the two signal waveforms. If the difference exceeds 0.3% (equivalent to 0.3% harmonic distortion), the amber POWER GUARD indicator will light. If the difference continues to increase, the POWER GUARD circuit controls an electronic attenuator at the input to reduce the gain of the amplifier just enough to prevent any further increase in distortion. Distortion will not exceed 2% with as much as 14dB overdrive. Without POWER GUARD, the distortion could easily reach 40% for the same operating conditions.

A McIntosh power amplifier with POWER GUARD will always deliver its maximum distortion free output. This power is always well above the rated power due to the McIntosh philosophy of conservative design. You will never experience the harsh and damaging distortion due to clipping when using a McIntosh MC1000 Amplifier with POWER GUARD.

THE VERSATILE McINTOSH OUTPUT AUTOFORMER

All transistor power output circuits work best into what is called an optimum load. Depending on the number and configuration of transistors used, this optimum load may vary considerably from what a loudspeaker requires. In the case of more than one loudspeaker connected in parallel, the impedance load reflected 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 extra current to flow and extra heating of the power transistors. This means the amplifier will run much hotter, with a corresponding reduction in operating life.

The output signals from the two balanced circuits in the MC1000 are coupled into the autoformer at the point on the windings that is an optimum impedance match for the transistors in the circuit. The autoformer includes balanced output impedance taps for exact loudspeaker matches of 2 ohms, 4 ohms and 8 ohms. The MC1000 amplifier will always be operating at its most efficient point, and speaker performance always will be at its best. Any McIntosh power amplifier with an autoformer is especially well suited for stereo installations that require multiple speakers, since it is possible to have a very close impedance match.

The frequency response of a McIntosh autoformer exceeds that of the output circuit itself, and extends well beyond the audio range. Its distortion level is so low it is virtually impossible to measure. The McIntosh Autoformer is, quite simply, a significant engineering advance in power amplifier performance and reliability. The unequalled expertise of McIntosh in the design and manufacturing of autoformers is legendary in the high fidelity industry.

In the rare event of output circuit failure, the McIntosh autoformer will conduct any speaker damaging DC (direct current), directly to circuit ground. This will protect your valuable loudspeakers from possible damage.

TECHNICAL DESCRIPTION

TRUE POWER OUTPUT WATT METER

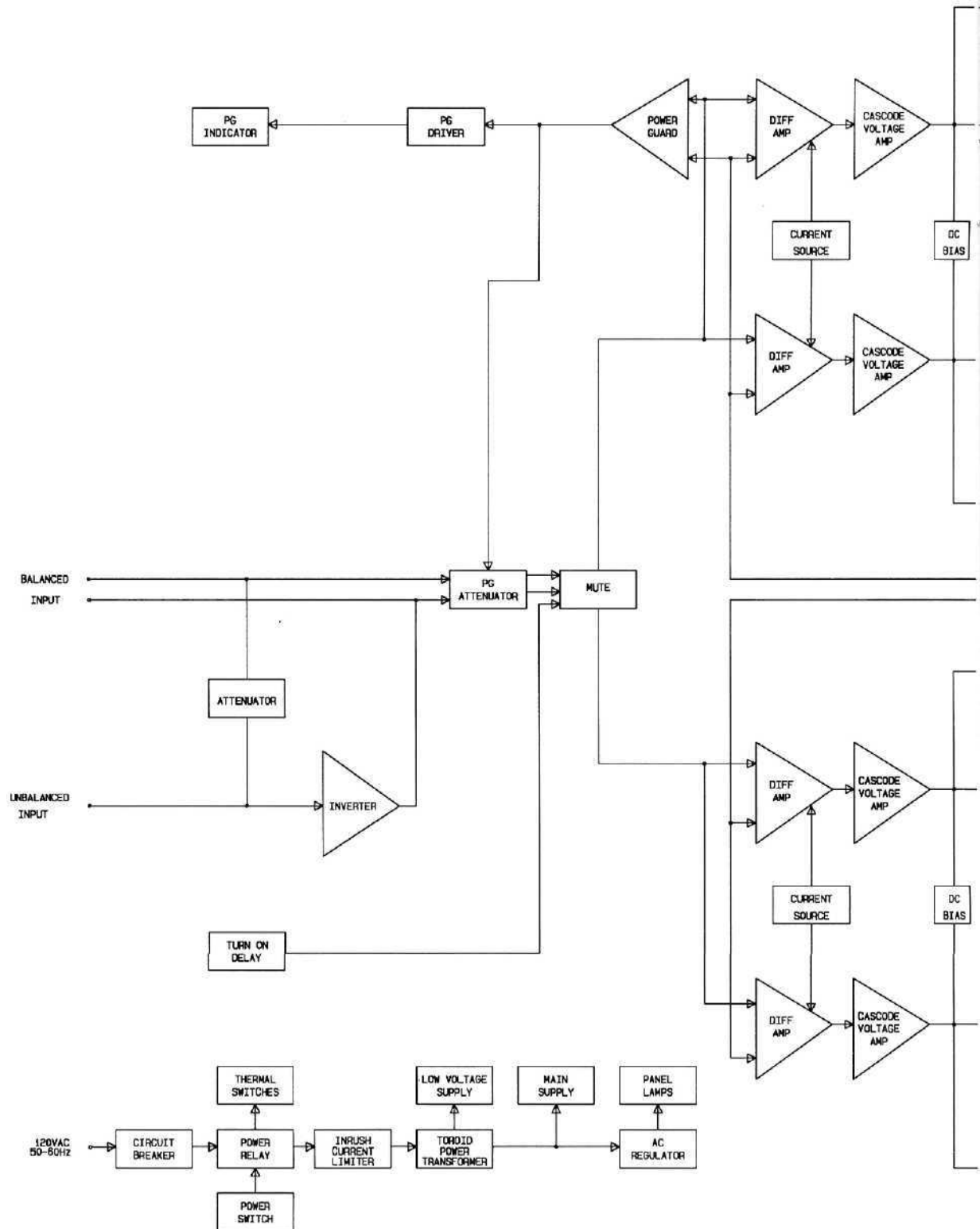
An illuminated 8 inch WATT meter is provided on the MC1000 front panel. The meter is peak responding and its circuits are constantly reading both voltage and current delivered to the speaker load. A speaker may have a change in impedance at different frequencies resulting in a change of output current requirements. The MC1000 meter reacts to these changing conditions and indicates the true amplifier power output at all times. In the METER WATTS position, the meter responds to the musical information and reads the amplifier output on a continuous basis. In the METER HOLD position the meter will lock to the highest power peak in a sequence of peaks. If no higher power peaks are reached, the meter pointer will slowly return to the lower power level. If the music stops, the meter pointer will return to the rest position. The meter pointer decay rate is approximately 6dB per minute. The MC1000 output meter is extremely accurate, and will respond to 95% of full scale, with only a single cycle of a 2,000Hz tone burst.

ADDITIONAL FEATURES

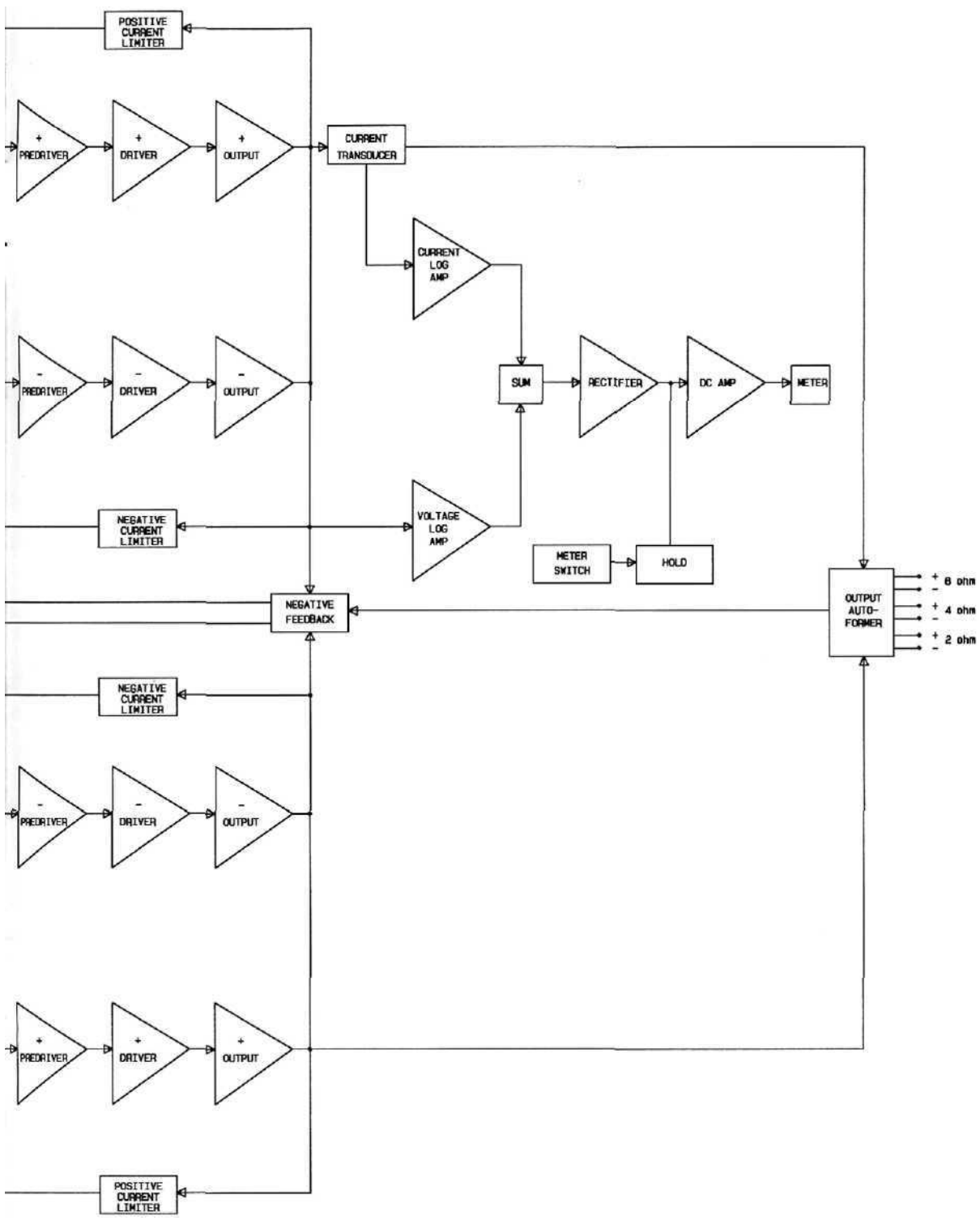
Heavy duty high current gold plated output terminals will accept speaker cables up to 0.204 inches (5.18mm) in diameter. It is easy to connect speakers using any of the currently popular speaker cables.

Both Balanced as well as an Unbalanced input jacks are provided for complete flexibility in any installation.

BLOCK DIAGRAM



BLOCK DIAGRAM



Radon III

THE UNIVERSITY OF CHICAGO
PRESS

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