



**MC 500
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 adapters 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 PEVENIR LES CHOCS ELECTRIQUES 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 A FOND ANS 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-SERVICEABLE 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.

LIGHTNING - For added protection for this product during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the antenna or cable system. This will prevent damage to the product due to lightning or power line surges.

OVERLOADING - Do not overload wall outlets, extension cords or integral convenience receptacles as this can result in a risk of fire or electric shock.

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THANK YOU

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 and purchase date are important to you for possible insurance claim or future service. Record this information here.

Serial Number

Purchase Date

TABLE OF CONTENTS

INTRODUCTION.....	5
INSTALLATION.....	5
FRONT PANEL FEATURES.....	5,6
HOW TO CONNECT INPUTS.....	6
HOW TO CONNECT OUTPUTS.....	7, 8
CONNECTING DIAGRAMS.....	9, 10
TECHNICAL DESCRIPTION.....	11, 12, 13
SPECIFICATIONS.....	14

INTRODUCTION

The McIntosh MC500 is a 500 watt per channel stereo power amplifier created in a stunning new contemporary industrial design. Two 5-1/2 inch True Power Output meters are mounted behind the 1/2 inch thick glass front panel. The high efficiency of the MC500 circuits together with oversize heatsinks utilizing convection cooling eliminates the need for internal cooling fans. Typical McIntosh attention to detail includes the use of 1% metal film resistors and polypropylene capacitors throughout. Internal heatsink module connectors use gold plated contacts to ensure reliable operation.

Gold plated Balanced as well as Unbalanced Input connectors ensure reliable signal transfer. A rear panel MODE switch is also provided to change the MC500 output configuration from a 500 watt per channel STEREO amplifier to a 1000 watt bridged mono amplifier. The patented McIntosh Power Guard circuit in each channel eliminates the possibility of overdriving the MC500 amplifier into clipping distortion. McIntosh Sentry Monitor Output protection circuits are also included. You ensure maximum amplifier reliability and long operating life with absolutely no sonic limitations or compromises.

Each channel is coupled to the loudspeaker loads by a McIntosh Output Autotransformer with matched impedances of 2, 4 and 8 ohms. Each channel of the MC500 can produce a peak current output of more than 112 amperes, the highest ever for a McIntosh stereo power amplifier. The MC500 can successfully drive any type of loudspeaker. With a distortion limit of less than 0.005%, the MC500 power amplifier is absolutely transparent, ensuring total sonic accuracy.

McIntosh knows how to do it right.

INSTALLATION

The McIntosh MC500 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) above the heat sink area so airflow is not obstructed. The recommended minimum mounting depth, including clearance for connectors is, 20-1/8 inches (51.1cm). This dimension includes the handles which extend from the front panel.

For detailed information on the operating features and circuit designs of the MC500, please refer to the section in this manual titled TECHNICAL DESCRIPTION.

POWER LEVEL METERS

The two power output meters indicate the power output in watts of each channel of the MC500 to an accuracy of 95%.

METER: WATTS/HOLD

In the WATTS position, the meters will respond continuously to the power output produced by each channel.

POWER: OFF-REMOTE/ON

The OFF-REMOTE switch position allows the MC500 to be turned on remotely from a

FRONT PANEL FEATURES

FRONT PANEL FEATURES

compatible McIntosh Control Center by sending a signal to the MC500 POWER CONTROL IN connector on the rear panel.

The ON position turns on the MC500 as long as its power cord is connected to a live AC outlet.

POWER GUARD

The patented McIntosh POWER GUARD circuit prevents the MC500 from ever being driven into clipping. This protects you from distortion and possible speaker damage. The POWER GUARD LED under each meter will light whenever POWER GUARD is activated, and indicates that you are being protected.

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 MC500 has input facilities for both Balanced and Unbalanced cables. Use either type of input, but not both at the same time.

STEREO

Set the rear panel MODE Switch to the STEREO position.

STEREO UNBALANCED INPUTS

Connect shielded cables with RCA type connectors from the outputs of a Preampifier, Control Center or similar accessory unit to the Unbalanced Inputs of the MC500.

STEREO BALANCED INPUTS

It is possible for unbalanced interconnecting cables to pick up interference from other equipment, AC cables or electrical appliances. Using Balanced cables will provide an additional 40dB of protection against such hum or noise interference.

If two MC500 amplifiers are used in Bridged Mono as a stereo pair, use the Balanced Inputs to avoid the possibility of ground loop hum pickup.

Use 2 conductor shielded cable with XLR type connectors. The MC500 Balanced Input connectors are Female, requiring a Male connector plug.

Pin Configuration for the MC500 Balanced XLR Input Connectors:

PIN 1: Shield or Ground

PIN 2: + Input

PIN 3: - Input

R/BRIDGED (MONO)

Set the rear panel MODE Switch to the BRIDGED position. Only the R/BRIDGED (RIGHT) channel Balanced and Unbalanced Inputs are used in BRIDGED Mono configuration.

R/BRIDGED (MONO) UNBALANCED INPUT

Connect a shielded cable with an RCA type connector to the R/BRIDGED (RIGHT) UNBALANCED Input on the MC500.

R/BRIDGED (MONO) BALANCED INPUT

Connect a 2 conductor shielded cable with an XLR connector to the R/BRIDGED (RIGHT) BALANCED Input on the MC500.

SPEAKER CABLES

Use high quality 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 loudspeaker combination. The high power output capability of the MC500 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 type of cable that will work best in your installation.

STEREO OUTPUTS

The MC500 incorporates the legendary McIntosh designed and manufactured Output Autoformers, to ensure peak performance, speaker protection and outstanding amplifier-loudspeaker compatibility. The MC500 Autoformer used on each channel has three different output impedance connections for optimum matching to the particular loudspeakers, or combination of loudspeakers being used. The following table will help determine which impedance connection will be best for your loudspeakers. You may find it desirable to consult your McIntosh dealer or the manufacturer of your loudspeaker for further information on the correct impedance to use.

SPEAKER IMPEDANCE IN OHMS	MC500 AMPLIFIER OUTPUT TERMINAL CONNECTIONS
2 to 4 ohms	COM and 2 (L and R)
4 to 8 ohms	COM and 4 (L and R)
8 ohms and up	COM and 8 (L and R)

Connect cables from each loudspeaker Common or Minus terminal to the MC500 **COM (Common) POWER OUTPUT** terminals. Connect cables from each loudspeaker Hot or Plus terminal to the desired MC500 **2, 4, or 8 (L and R) STEREO POWER OUTPUT** terminals.

Most loudspeakers have their input terminals both marked and color coded. Usually the Common or (-) terminal is **BLACK**, and the Hot or (+) terminal is **RED**.

The MC500 Output signals are IN PHASE with the Input signals.

The actual load impedance of some loudspeakers may drop below the specified impedance at some points in the audio frequency range. This will be no problem. The high current output of the MC500 will produce the extra current necessary to properly drive the loudspeaker under these conditions.

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

BRIDGED (MONO) OUTPUT

In BRIDGED Mono configuration the outputs of the two channels of the MC500 will combine to produce 1000 watts. All performance specifications for the stereo configuration will be exactly the same in BRIDGED Mono configuration, but with double the power. In BRIDGED Mono Configuration, only the BRIDGED Output terminals marked +4, +8, +16, -4, -8, and -16 are used. The COM (Common) terminals are not used.

HOW TO CONNECT OUTPUTS

SPEAKER IMPEDANCE IN OHMS	BRIDGED MC500 OUTPUT TERMINAL CONNECTIONS
4 to 8 ohms	+4 and -4
8 to 16 ohms	+8 and -8
16 ohms and up	+16 and -16

To maintain the MC500 Output signal IN PHASE with the Input signal, connect the Common or minimum (-) loudspeaker cable to an MC500 **Minus (-) L BRIDGED OUTPUT** impedance terminal, and the Hot or (+) cable to an MC500 **PLUS (+) R BRIDGED OUTPUT** impedance terminal

IMPORTANT

BE SURE TO REPLACE THE PROTECTIVE POWER OUTPUT TERMINAL COVER AFTER THE LOUDSPEAKERS ARE CONNECTED. THE MC500 CAN DELIVER MORE THAN 126 VOLTS FROM THE BRIDGED (MONO) +16 AND -16 TERMINALS, WHICH CAN BE A SHOCK HAZARD.

HOW TO CONNECT AC POWER

The MC500 is designed to operate on 120 volts 50/60Hz AC current. Power consumption is rated at 12 amperes UL/CSA. This current requirement applies when the amplifier is being used for typical music reproduction. The MC500 will draw higher current with steady test tone signals.

Plug the MC500 into a dedicated AC output with a 15 ampere or higher current capacity. Turn the front panel POWER Switch ON or OFF as needed

POWER CONTROL IN/OUT

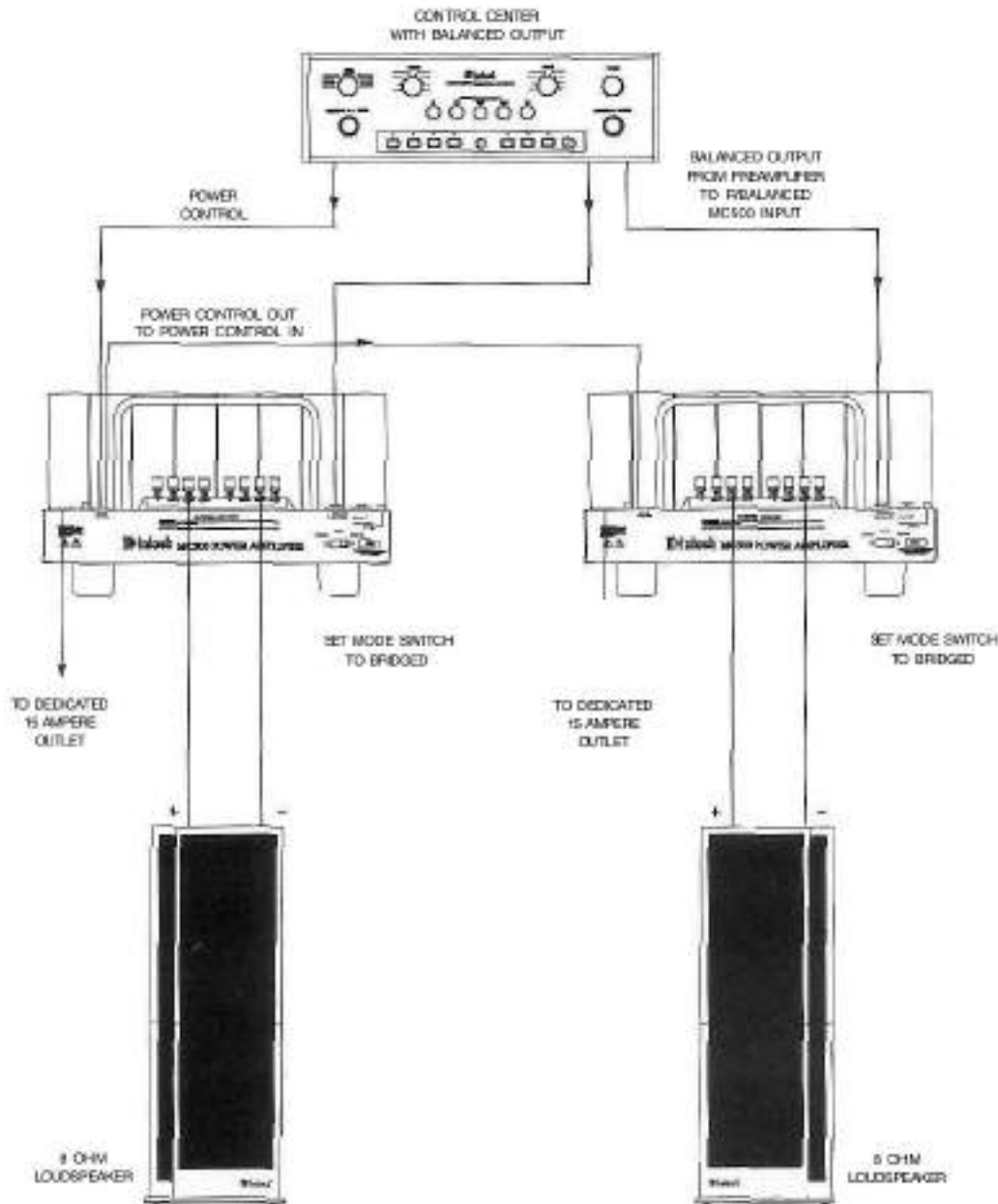
The MC500 can be turned ON and OFF remotely by means of a DC POWER CONTROL signal from a compatible McIntosh Control Center or Power Amplifier. Connect a cable from the POWER CONTROL OUT on the accessory McIntosh unit, to the POWER CONTROL IN on the MC500. When the accessory unit is turned on, the Power Control signal will then turn on the MC500. The POWER CONTROL OUT on the MC500 will feed the same turn on control signal out, time delayed, to an additional McIntosh Power Amplifier or compatible accessory.

When a pair of MC500 amplifiers are configured in BRIDGED (Mono) for a stereo system, connect a cable from the Control Center POWER CONTROL OUT to the POWER CONTROL IN on one of the MC500 amplifiers. Connect a second cable from the first MC500 POWER CONTROL IN. Connect the power cord of each MC500 to a separate dedicated 15 ampere outlet.

A POWER CONTROL cable uses single conductor shielded wire with 1/8 inch mini phone plugs on each end. Connections are to the sleeve and tip of each plug.

DONOT PLUG THE MC500 POWER CORD INTO THE BACK PANEL AC OUTLET OF A PREAMPLIFIER, CONTROL CENTER OR SIMILAR ACCESSORY. PLUG THE CORD DIRECTLY INTO A WALL SOCKET OR HEAVY DUTY AC POWER STRIP OR RELAY.

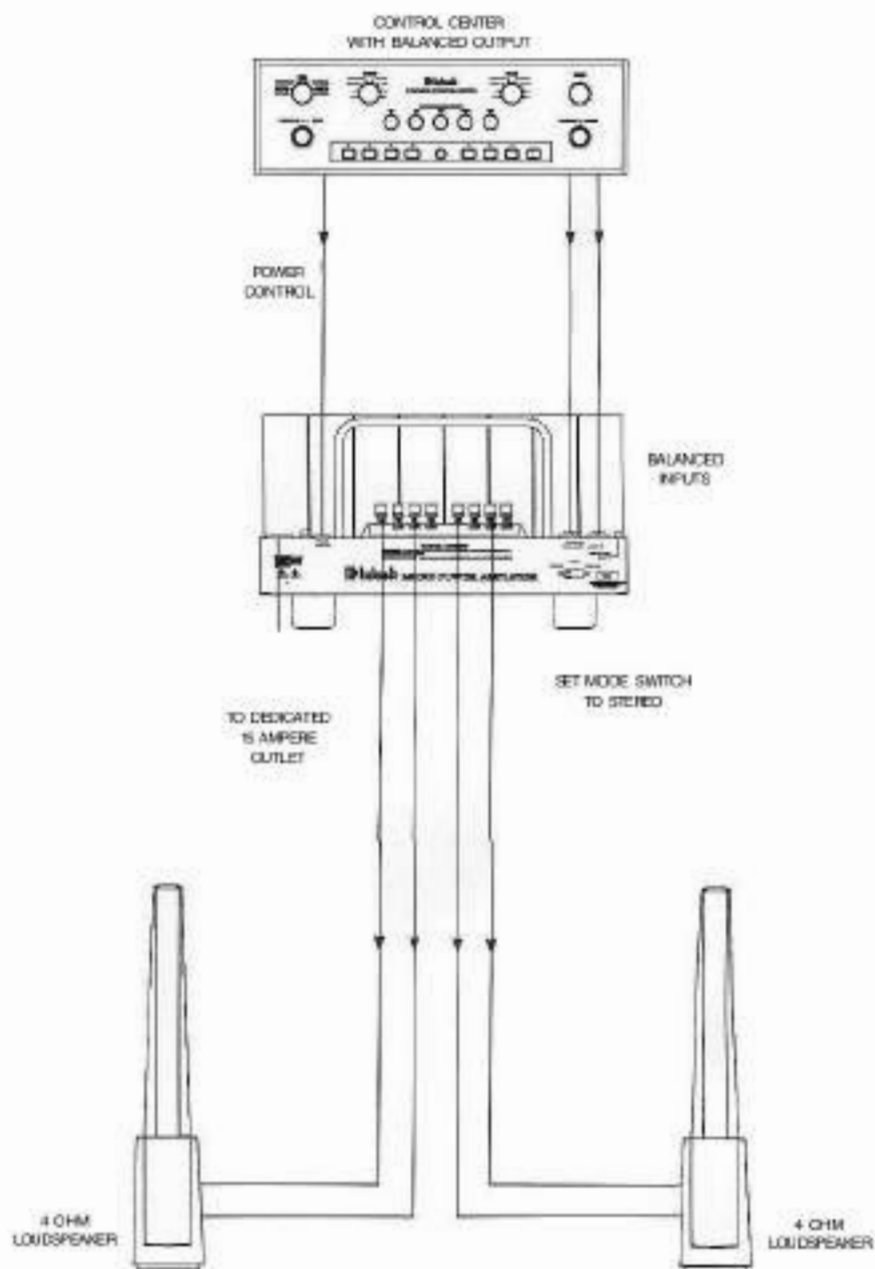
CONNECTING DIAGRAM BRIDGED (MONO)



CONNECTING DIAGRAMS

CONNECTING DIAGRAMS

CONNECTING DIAGRAM STEREO



DESIGN PHILOSOPHY

The design philosophy incorporated in the MC500 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.

All transistors are selected to have nearly constant current gain (Beta) over the entire current range they must cover. Output transistors in particular, must 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 MC500 to insure it a long, safe and trouble free operating life. This is just one of the characteristics of McIntosh power amplifiers that have 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 MC500 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 were connected to the MC500 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 to the maximum amount of heat they can safely tolerate. The MC500 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 and the amplifier cools to its normal operating temperature, the AC power will turn back on.

TECHNICAL DESCRIPTION

POWER GUARD

The MC500 includes the unique patented McIntosh POWER GUARD circuit on each channel. 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 McIntosh 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 of the amplifier to reduce the gain 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 MC500 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 channels in the MC500 are coupled into the autoformer at the point on the windings that is an optimum impedance match for the transistors in the output circuit. The MC500 amplifier output circuits are always operating at their highest possible efficiency.

The MC500 autoformers include output impedance taps for exact loudspeaker matches of 2 ohms, 4 ohms and 8 ohms. Loudspeaker performance will always 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.

TRUE POWER OUTPUT WATT METERS

Two illuminated 5-1/2 inch WATT meters are provided on the MC500 front panel. The meters are peak responding and their circuits are constantly reading both voltage and current delivered to the loudspeaker loads. The load impedance of a loudspeaker may differ at various parts of the audio frequency range, resulting in a change of output current requirements. The MC500 meters react to these changing current and voltage conditions and indicate the true amplifier power output of each channel at all times.

In the METER WATTS position, the meters respond to the musical information and read the amplifier output of each channel on a continuous basis. In the METER HOLD position the meters will lock to the highest power peak in a sequence of peaks. If no higher power peaks are reached the meter pointers will slowly return to the lower power level. If the music stops, the meter pointers will return to the rest position. The meter pointer decay rate is approximately 6dB per minute. The MC500 output meters are extremely accurate, and will respond to 95% of full scale, with only a single cycle of a 2,000Hz tone burst.

The upper scale on the meters is calibrated in average watts power, and the lower scale in decibels. The meter calibration lines reading from right to left, starting at the 500 watt indication are as follows:

500	(Indicated)	0.5	(Indicated)
200		0.2	
100		0.1	
50	(Indicated)	0.05	(Indicated)
20		0.02	
10		0.01	
5	(Indicated)	0.005	(Indicated)
2		0.002	
1		0.001	

Two additional calibration marks above 500 watts are on the meters. The first mark is 1000 watts (+ 3dB), and the second mark is 2000 watts (+ 6dB). The amplifier cannot produce a continuous 2000 watts of power, but can produce well above 500 watts on program peaks, especially into lower impedance loads.

In MONO operation, the two meters will read identical power levels. The total mono power output of the amplifier will be the sum of these readings.

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.

SPECIFICATIONS

POWER OUTPUT

500 watts per channel into an 8, 4 or 2 ohm load is the minimum sine wave continuous average power output

1000 watts Mono into a 16, 8 or 4 ohm load is the minimum sine wave continuous average power output

RATED POWER BAND

20Hz to 20,000Hz

TOTAL HARMONIC DISTORTION

0.005% maximum harmonic distortion at any 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

4.4V Balanced Stereo

2.2V Unbalanced Stereo

4.4V balanced mono

5.5V Unbalanced mono

A-WEIGHTED SIGNAL-TO-NOISE RATIO

85dB (115dB below rated output)

INTERMODULATION DISTORTION, SMPTE

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

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

SIZE

17-1/4 inches (43.8cm) W, 10-3/8 inches (26.4cm) H, 20-1/3 inches (51.1cm) D. including front handles

WEIGHT

114 pounds (51.7Kg) net, 127 pounds (57.6Kg) shipping