

**MC 7100
POWER
AMPLIFIER**

Serial numbers KC1001 and higher.

IMPORTANT SAFETY INSTRUCTIONS

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.

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

Your MC7100 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 canceled.* 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.

INTRODUCTION

The electrical and mechanical design of the MC7100 Power Amplifier is the result of the many years of engineering and manufacturing experience of the design staff at McIntosh. This "Know How", along with the meticulous attention to design and production details, makes the MC7100 one of the finest amplifiers ever produced by McIntosh Laboratory.

The use of 4 complimentary connected output transistors per channel, allows not only full power output into normal loads, but extra high current output to drive uneven speaker loads. Some speakers have design characteristics that cause them to dip below their rated impedances at certain frequencies. It is possible for the MC7100 to deliver as much as 18 amperes peak current into these lower impedance loads.

The MC7100 provides this extra current output with complete reliability due to the use of McIntosh Sentry Monitor protection circuits. Some power amplifier manufacturers have claimed that their products do not use protection circuits since they compromise performance. The real genius of McIntosh engineering design has recognized these potential problems and completely eliminated them. Properly designed protection circuits assure you an amplifier that will operate under all types of user conditions with maximum reliability and freedom from possible speaker or amplifier damage. The benefits of these designs mean you own an amplifier that will continue to operate safely for many years.

The MC7100 output is so distortion free, it is difficult to measure with conventional instruments. The performance limit is 0.005% maximum distortion, yet it is typical for an amplifier to measure as low as 0.002% at mid frequencies into 8 ohms.

As in all McIntosh power amplifiers, the famous patented McIntosh POWER GUARD circuit is included. You never have to be concerned with possible amplifier overdrive. You will not experience amplifier clipping with its harsh speaker damaging distortion when playing wide dynamic range program sources such as compact discs.

Many other desirable features are included such as gold plated output terminals, DC output protection, thermal protection and a turn on delay circuit. A Toroidal wound power transformer permits a low profile design with quiet cool operation.

Refer to the section in this manual titled TECHNICAL DESCRIPTION for detailed information on all the outstanding circuit and performance features of the MC7100.

LOCATION

The MC7100 may be installed on a shelf or table, in a McIntosh cabinet, or custom installed in furniture of your choice. Always provide adequate ventilation for the amplifier. The trouble free life of any electronic instrument is greatly extended by providing sufficient ventilation. This prevents build-up of internal temperatures that can cause deterioration of circuit components. The McIntosh cabinet design allows for proper ventilation.

Allow enough clearance so cool air can enter at the bottom of the cabinet and be vented from the top. Provide at least 1 1/2 inches (3.8cm) above the amplifier heat sink area so airflow is not obstructed. The recommended minimum space for installation is 18 1/2 inches (47cm) wide, 14 1/2 inches (36.8cm) deep, (including connectors) and 4 1/2 inches (11.5cm) high. Allow 1 inch (2.54cm) in front of the mounting surface for panel clearance.

McINTOSH PANLOC MOUNTING SYSTEM

The PANLOC system of installing equipment is a product of McIntosh research. Two steel PANLOC mounting shelves are attached to the front panel at each side of the panel cutout, using the screws and brackets provided. The amplifier has runners on the bottom of its chassis,

INSTALLATION

HOW TO CONNECT INPUTS

INPUT CABLES

Use shielded cables to connect the signals from the preamplifier or other signal source to the power amplifier. To minimize the possibility of hum pickup or interference, locate the cables away from AC power cords or loudspeaker cables.

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

STEREO OPERATION

UNBALANCED INPUT CONNECTORS

Use shielded single conductor cable with RCA type connectors. Connect a cable from the LEFT channel of a preamplifier or control unit output to the L (left) UNBALANCED INPUT jack on the MC7100. Connect the RIGHT channel output to the R (right) UNBALANCED INPUT jack on the MC7100.

BALANCED INPUT CONNECTORS

Use shielded male-to-female Balanced cables with XLR connectors. Connect a Balanced cable from the Balanced LEFT channel preamplifier output to the L (LEFT) BALANCED INPUT on the MC7100. Connect the RIGHT channel Balanced preamplifier output to the R (RIGHT) BALANCED INPUT on the MC7100.

Using Balanced connectors and cables can reduce noise and interference by as much as 40dB in some installations. This extra noise reduction can be significant, especially if the cables are quite long. If cable lengths between the control unit and the MC7100 are one meter or less, you may find high quality unbalanced cables to be quite satisfactory.

Balanced Jack Pin Configuration

- Pin 1. System Ground
- Pin 2. + Output
- Pin 3. - Output

MONOPHONIC (BRIDGED) OPERATION

A rear panel MODE switch allows the MC7100 to be used as a normal stereo amplifier, or as a bridged mono amplifier.

Connect a shielded cable from a mono signal source to the R (right) /MONO input jack on the MC7100. Set the mode switch to MONO. Only the right channel LEVEL control functions in MONO operation. The outputs must be connected as indicated in HOW TO CONNECT OUTPUTS for proper mono operation.

INPUT LEVEL CONTROLS

These controls adjust the input volume levels of each channel. When the LEVEL controls are in the 12 o'clock or DETENT position, the amplifier input sensitivity for the rated 100 watts output is 2.5 volts.

The 2.5 volt sensitivity setting is recommended for the best operation with a McIntosh preamplifier or control center.

Turning the LEVEL controls fully on; (clockwise), will give a higher amplifier sensitivity of 1.4 volts which may be required for other applications.

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. Consult your McIntosh dealer for recommendations on the cables that will best fit the needs of your stereo installation.

STEREO OPERATION

(Set the MODE Switch to the STEREO position)

The outputs of the MC 7100 are direct coupled, and match speaker loads from four to eight ohms and higher.

Connect a cable from the LEFT speaker COMMON terminal to the amplifier L (Left) - (minus) OUTPUT terminal. Connect a cable from the LEFT speaker HOT terminal to the amplifier L (Left) + (Plus) OUTPUT terminal. Connect the right speaker to the right channel amplifier terminals in a similar manner.

The COMMON and HOT terminals, (- and +), of both speakers must be connected in an identical manner to the proper amplifier output terminals so the speakers will operate IN PHASE. This means that the speaker driver surfaces move back and forth the same in each speaker system. Almost all loudspeaker systems have their hot and common terminals color coded, with red usually as hot or plus. The output signals of all McIntosh power amplifiers are always IN-PHASE with the input signals.

The crosstalk between channels on the MC 7100 is almost non-existent, so each channel can be used as a separate monophonic amplifier. An example would be one channel feeding background music to a given area, and the other channel feeding a different program signal to another area.

MONOPHONIC (BRIDGED) OPERATION

(Set the MODE Switch to the MONO position)

Connect a cable from the monophonic speaker COMMON terminal to the MONO - (Minus) amplifier output terminal. Connect a cable from the speaker HOT terminal to the amplifier MONO + (Plus) terminal.

The MC 7100 amplifier monophonic output signal will be in phase with the input signal when the speaker is connected as indicated.

It is recommended that speaker loads no lower than 8 ohms be used with the amplifier in the Bridged Monophonic configuration.

AC POWER

POWER (ON, OFF/REMOTE, AC POWER and POWER CONTROL, IN/OUT

The MC7100 is designed to operate on 120 volts 50/60Hz current and can be turned on by three different methods.

1. Connect the amplifier power cord to a switched AC receptacle on the back panel of a preamplifier, control center or other accessory component. Turn the MC7100 POWER Switch to ON, and the MC7100 will turn on whenever the switch AC outlet turns on.

Make certain that the AC outlet used can supply at least 6 amperes of current. The amplifier can draw up to 5 amperes from the AC power line when both channels are producing rated power output.

2. Connect the amplifier directly to a wall AC outlet. Turn the MC7100 POWER Switch ON or OFF as needed.

3. Connect the amplifier directly to a wall AC outlet and turn it on and off by a 5-volt DC Logic 1 control signal fed to the POWER CONTROL IN jack. Turn the MC7100 POWER Switch to OFF REMOTE. A McIntosh C39, MX130 or similar compatible component can supply the required control signal that will turn the MC7100 on or off.

The POWER CONTROL connectors use single conductor shielded cables with 1/8 inch mini phone plugs. Connections are to the Tip and Sleeve of the plug.

The MC7100 POWER CONTROL OUT jack will feed the same control signal out to another accessory with a compatible Power Control input.

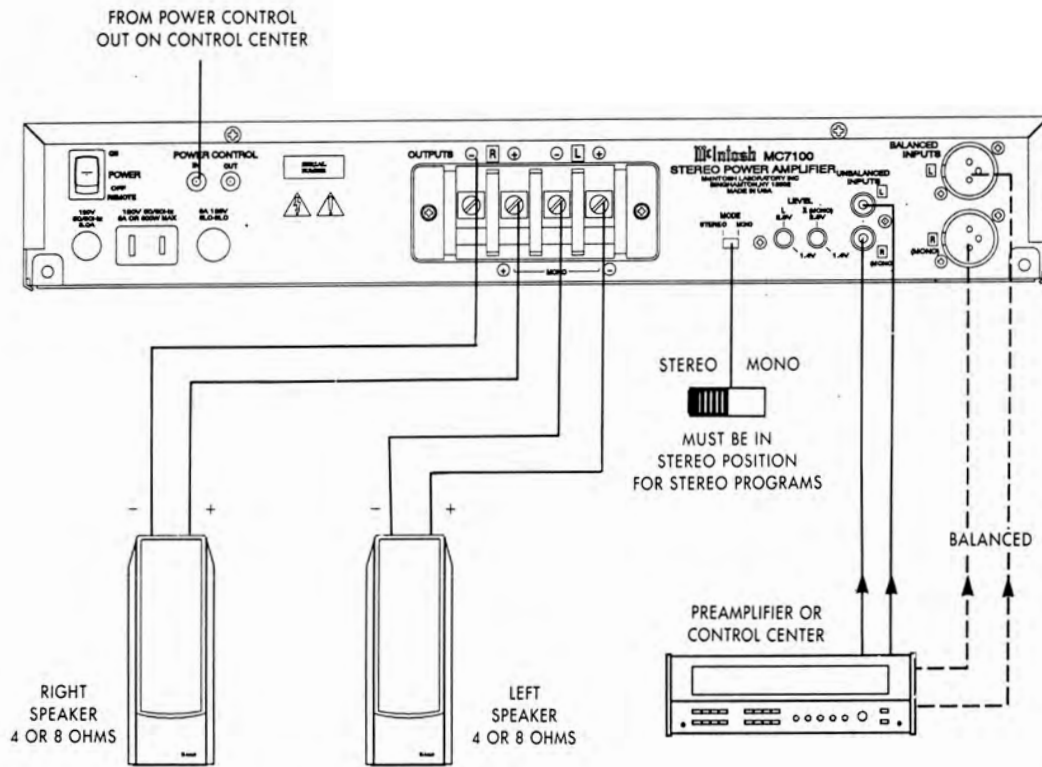
FUSE

A 5-ampere SLO-BLO fuse protects the MC7100 circuits. This fuse does not protect the auxiliary AC outlet.

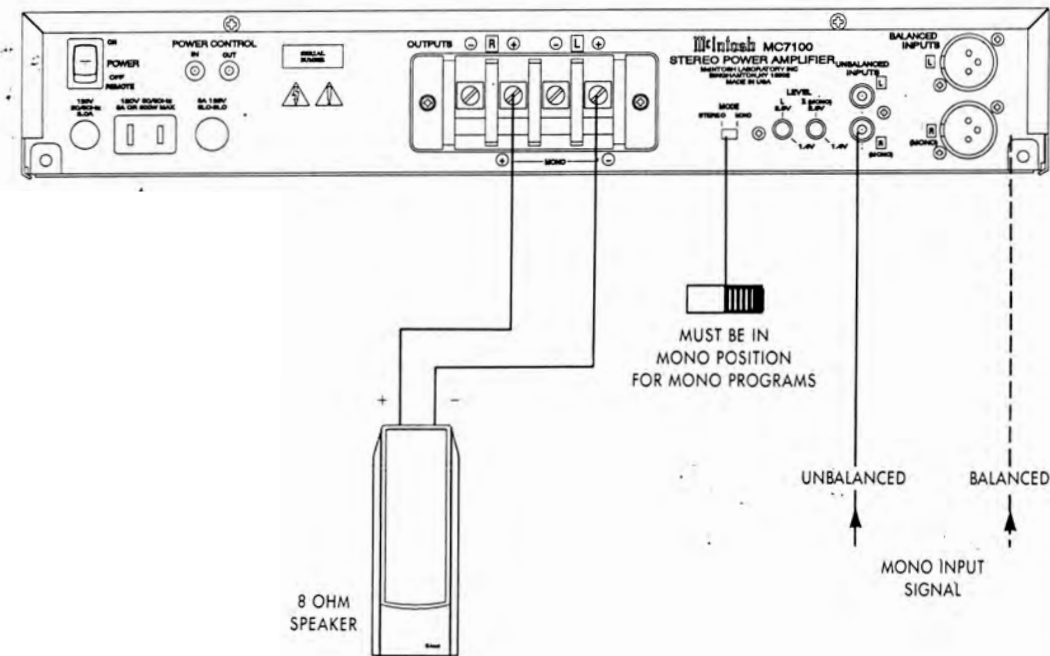
FRONT PANEL

The front panel is the "Classic McIntosh" black glass with back lighted nomenclature. The RED AC power indicator as well as the teal colored panel nomenclature will illuminate when AC power is on. The amber POWER GUARD indicators will flash whenever the POWER GUARD circuit is activated.

STEREO CONNECTION



BRIDGED MONO CONNECTION



TECHNICAL DESCRIPTION

DESIGN PHILOSOPHY

The MC7100 stereo power amplifier is designed to operate loudspeakers with a nominal impedance of 4 to 8 ohms. It features a new circuit design that keeps distortion levels so low it takes special test gear for accurate measurements.

The design philosophy that resulted in the outstanding performance of this amplifier involved several different techniques. Every stage of voltage or current amplification was designed to be as linear as possible prior to the use of negative feedback.

1. Each transistor is selected to have nearly constant current gain (Beta) over its entire operating range.
2. The load impedance presented to each amplification stage is made as uniform as possible for all signal levels.
3. The input impedance of each amplifier stage is increased and made more linear by using emitter degeneration whenever possible.
4. Resistors and capacitors in the signal path are carefully selected to have exceedingly low voltage coefficients (change of resistance or reaction with applied voltage). Precision metal film resistors and low dielectric absorption film capacitors are used in all critical circuit locations.
5. Output transistors have matched uniform current gain, high current gain-bandwidth product, low output capacitance and large active-region safe operating area. These characteristics together with the automatic tracking bias system eliminate crossover distortion.

PROTECTION CIRCUITS

Some manufacturers of power amplifiers claim that their products do not need or 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 that have no effect or compromise on the normal performance of a power amplifier. The SENTRY MONITOR circuit is a good example. The MC7100 incorporates seven specific protection circuits to enhance its performance, increase its reliability and protect loudspeakers.

SENTRY MONITOR CIRCUIT

All power transistors have limits for the maximum amount of power they can handle. The MC7100 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 MC7100 outputs, destructive current levels could be reached if it was not controlled by the 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.

THERMAL CONTROL

All power transistors have limits to the maximum amount of heat they can safely tolerate. The MC7100 uses a highly efficient amplifying circuit that produces relatively little heat for the output power produced. The amplifier uses large area heat sinks to efficiently dissipate what heat it does generate. Natural convection air flow is sufficient for safe cool operation.

If the cooling air is blocked, or the amplifier operating temperature is forced too high, thermal cutout switches will turn off the speakers. Both POWER GUARD indicators will light con-

tinuously to show that thermal protection is operating. When the problem is corrected and the amplifier cools down to its normal operating temperature, the speakers will be turned back on.

DIRECT CURRENT FAILURE PROTECTION

A protection circuit is provided that turns off the speakers if for any reason a DC voltage should appear at the output terminals. This prevents possible speaker damage.

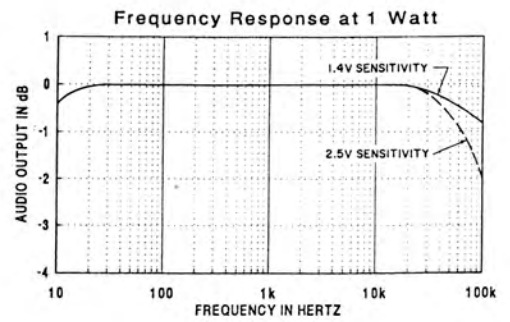
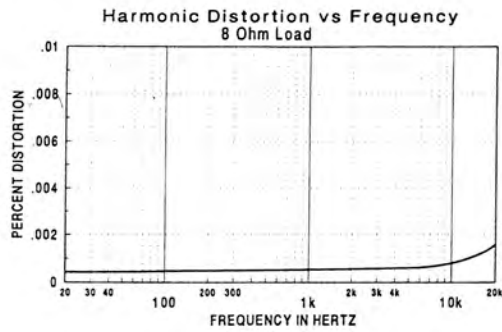
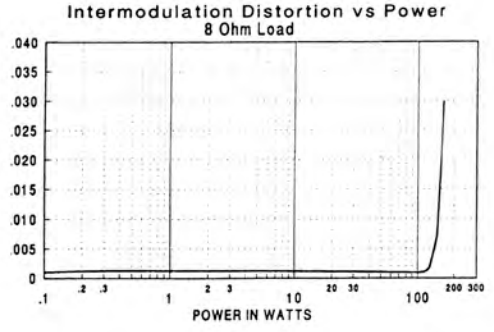
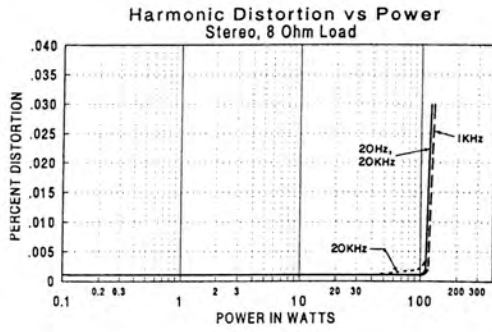
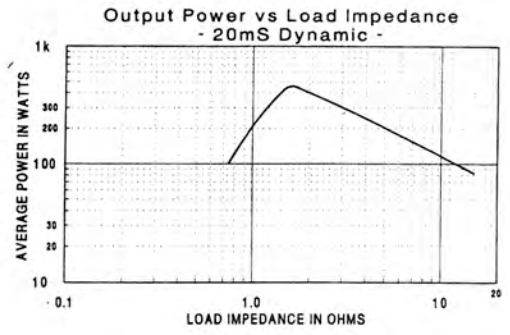
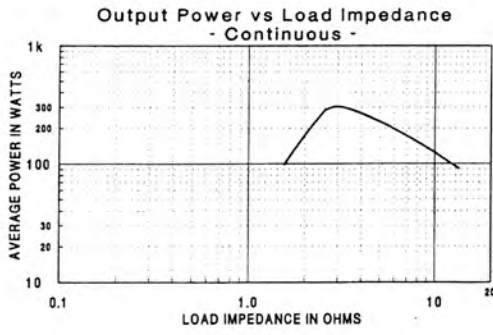
POWER GUARD

A unique and patented feature of McIntosh power amplifiers insures that each channel of the MC7100 will deliver full power, free of clipping distortion. 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 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 signals. Under normal operating conditions there are no differences between these signals. When an amplifier is overdriven beyond its maximum distortion free output, then there will be a difference between the two signals. 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.

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 POWER GUARD amplifier.

TECHNICAL DESCRIPTION

PERFORMANCE CHARTS



SPECIFICATIONS

STEREO POWER OUTPUT

150 watts into 4 ohm loads or 100 watts into 8 ohm loads minimum sine wave continuous average power output per channel, both channels operating.

The output RMS voltage is:

28.3V across 8 ohms

24.5V across 4 ohms

MONOPHONIC (BRIDGED)

300 watts into an 8 ohm load minimum sine wave continuous average power output.

OUTPUT LOAD IMPEDANCE

STEREO

8 or 4 ohms

MONOPHONIC

8 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.

IHF DYNAMIC HEADROOM

8 ohms, 1.7dB

4 ohms, 2.1dB

FREQUENCY RESPONSE

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

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

INPUT SENSITIVITY

1.4 volts (2.5 volts at gain control center detent)

A-WEIGHTED SIGNAL-TO-NOISE RATIO

90dB (110dB below rated output)

INTERMODULATION DISTORTION, SMPTE

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

WIDE BAND DAMPING FACTOR

8 ohms, 200

4 ohms, 100

INPUT IMPEDANCE

20,000 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, 3.0 amps UL/CSA

SIZE

Front panel: 17-1/2 inches (44.5cm) wide, by 3-5/8 inches (9.2cm) high. Depth is 16-1/2 inches (41.9cm) deep, including connectors. Panel clearance required in front of the mounting surface is 3/4 in (1.9cm).

FINISH

Glass with special gold/teal nomenclature illumination. Chassis and chassis cover are black.

WEIGHT

24 pounds (11Kg) net; 35 pounds (15.9Kg) in shipping carton.