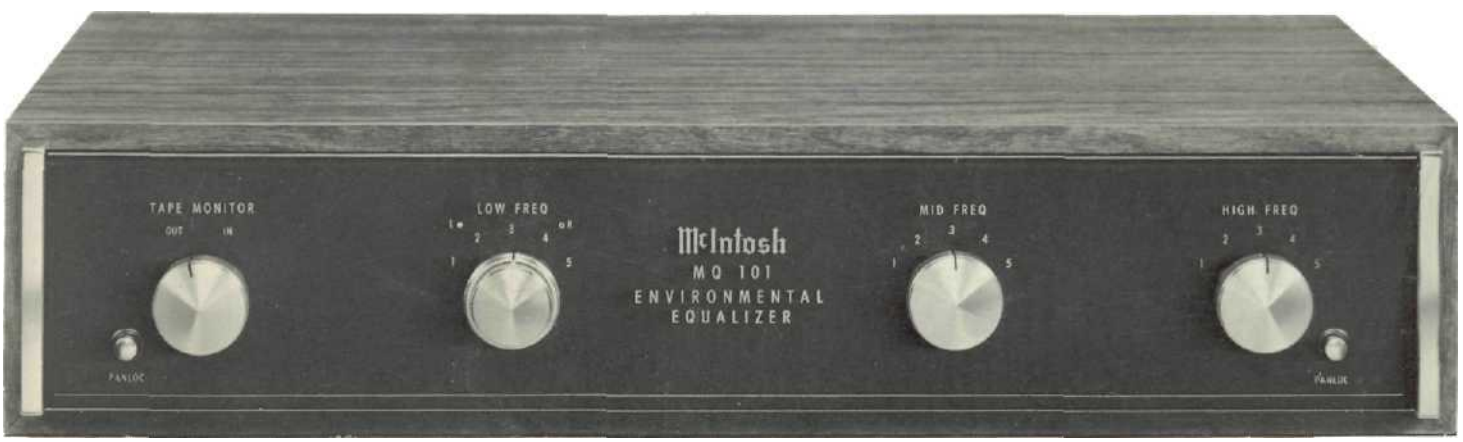
McIntosh
MQ 101

OWNER'S MANUAL

THE McINTOSH MQ101 ENVIRONMENTAL EQUALIZER



Price $1.25

Your MQ101 Environmental Equalizer will give you many years of pleasant and satisfactory performance. If you have any questions concerning the operation or maintenance of this instrument, please contact:

CUSTOMER SERVICE

McIntosh Laboratory Inc.
2 Chambers Street
Binghamton, New York 13903
Phone: 607-723-3512

Take Advantage of 3 years of FREE Factory Service … Fill In the Application NOW.

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GUARANTEE

McIntosh Laboratory Incorporated guarantees this instrument to be capable of performance as advertised. We also guarantee the mechanical and electrical workmanship and components to be free of defects for a period of 90 days from date of purchase. If such defects occur, McIntosh Laboratory or one of its authorized agencies will repair the defect at no cost to the purchaser. This guarantee does not extend to components damaged by improper use nor does it extend to transportation to and from the factory or service agency. This guarantee covers the MQ 101 only, and not its cabinet.

THREE YEAR FACTORY SERVICE CONTRACT

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

For Three Years from date of purchase —

1. 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. The SERVICE CONTRACT is given to purchasers who live in the 50 United States or Canada only.
6. For your protection McIntosh selects Its dealers carefully. Only one dealer in ten qualifies for a McIntosh franchise. To receive the SERVICE CONTRACT your purchase must be made from a McIntosh franchised dealer.
7. Your completely filled In application for a SERVICE CONTRACT must be postmarked within 30 days of the date of purchase of the instrument.
8. To receive the SERVICE CONTRACT all information on the application must be filled in. The SERVICE CONTRACT will be issued when the completely filled in application Is received at McIntosh Laboratory Incorporated In Binghamton, New York. If the application is not received at McIntosh Laboratory, only the service offered under the 90-day guarantee will apply.

Installation

Adequate ventilation extends the trouble-free life of electronic instruments. It is generally found that each 10° centigrade (18° F) rise in temperature reduces the life of electrical insulation by one half. Adequate ventilation is an inexpensive and effective means of preventing insulation breakdown that results from unnecessarily high operating temperatures. The direct benefit of adequate ventilation is longer, trouble-free life. Allow at least 15 inches deep x 16½ inches wide x 3½ inches high for mounting the MQ 101.

To prepare the MQ 101 for installation remove the plastic protective covering. Turn it upside down so that it rests on its top on the shipping pallet. Remove the two screws that fasten the chassis to the cabinet. After the screws have been removed slide the chassis out of the cabinet. Next, place the mounting brackets, the parts bag and the mounting template at hand.

The PANLOC professional mounting design eliminates the need for any shelf or bracket. The MQ 101 is supported by its own mounting brackets.

The design of the mounting template allows you to position or locate the cutout from the front or rear of the panel to which the instrument is to be mounted. Position the plastic mounting template over the area of the mounting panel to be cut out for installation.

If the cutout is to be located from the front of the panel, begin at Step 2. If the cutout is to be located from the rear of the panel, begin here.

1. On the back of the mounting panel, scribe a vertical centerline through the exact center of the area in which the cutout is to be made.

   Place the template against the back of the panel and match the template centerline with the centerline on the mounting panel.

   Make sure that there is at least ¼ inch clearance between the bottom of the dashed line of the cutout area on the template and any shelf or brace below the proposed cutout.

   Mark the locating holes ("C" holes on the mounting template).

   Drill the two locating holes. Be certain the drill is perpendicular to the panel.

   Now position the template on the front of the panel by aligning the "C" locating holes on the template with the drill holes.

2. If the cutout is to be located from the front of the mounting panel:

   With the template in place against the front of the mounting panel, mark the "A" and "B" drill holes and the four small holes that identify the corners of the cutout. Join the corner marks with a line. The edge of the template can be used as a straight edge.

   Accurately drill the holes on each side of the cutout area with a $^{3}/_{16}$ inch drill.

IMPORTANT: DRILL THE 6 HOLES BEFORE MAKING THE CUTOUT

Carefully cut out the rectangular opening. Be certain to saw on the INSIDE of the lines.

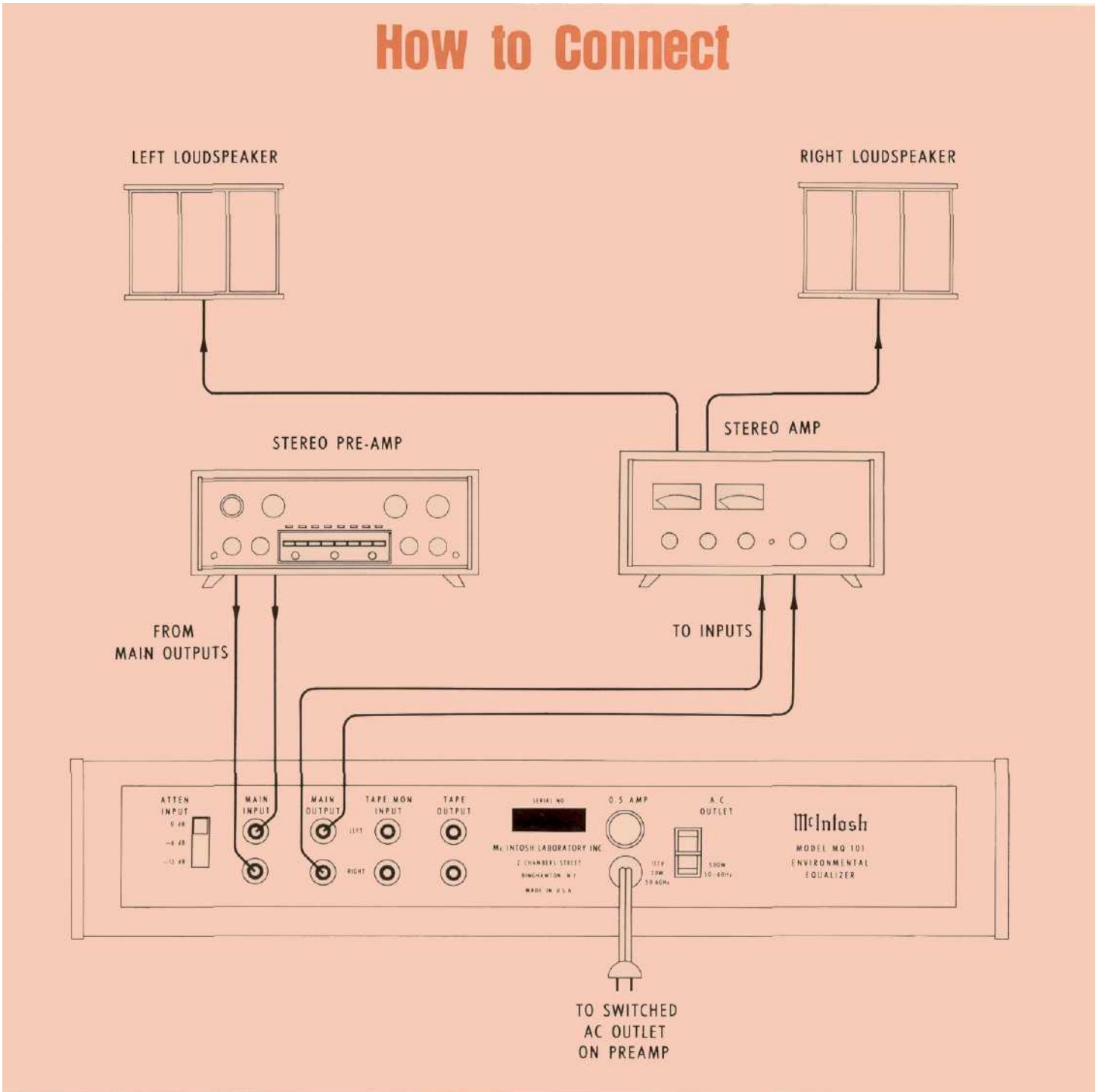
Secure the mounting strips to the rear of the mounting panel using two screws from the hardware package. Insert the screws in the center holes of the cabinet panel ("B" holes on the template) and tighten. The screw head should pull into the wood slightly. (Use two ¾ inch long screws for mounting panels up to ½ inch thick, or two 1¼ inch long screws for panels ½ inch thick and over.)

Attach the mounting brackets to the mounting panel using four screws.

Place the template over the mounting screws. The mounting screws should be centered in the "A" and "B" holes on the template. The sides of the mounting brackets should match the vertical dash lines on the template. If necessary, loosen the screws and push the brackets into alignment and retighten.

Insert the power cord through the mounting panel opening. Carefully slide the MQ 101 into the opening so the rails on the bottom of the equipment slide in the track of the mounting brackets. Slide the instrument in until its front panel is against the mounting panel. At the bottom front corners are the PANLOC buttons. Depressing the PANLOC buttons will lock the instrument firmly in the installation. Depressing the PANLOC buttons a second time (as with a ballpoint pen) will release the instrument. You can then slide the instrument forward for easy removal.

How to Connect

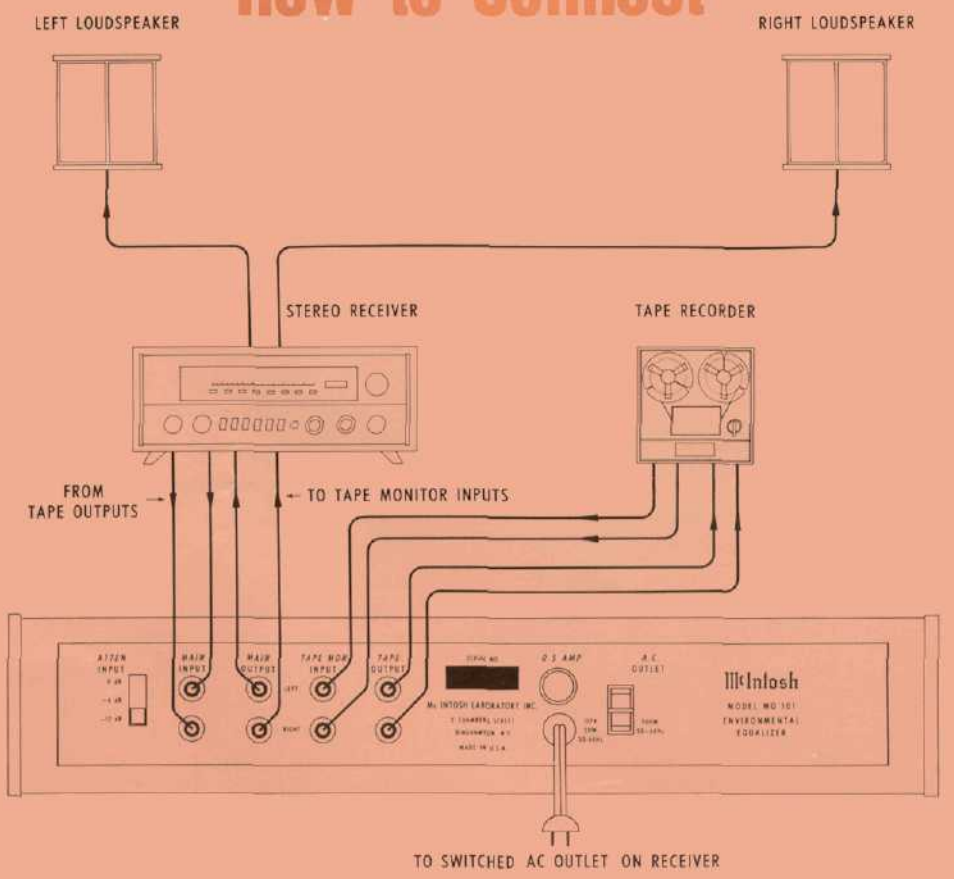


CONNECTING TO A PREAMPLIFIER/POWER AMPLIFIER SYSTEM

The MQ 101 is added to the circuit between the preamplifier and power amplifier. Connect shielded cables between the MAIN outputs of the preamplifier and the MAIN inputs on the MQ 101. Connect shielded cables from the MAIN outputs of the MQ 101 to the inputs of the power amplifier. The length of a connecting cable is limited by its electrical capacitance. The total capacity of each cable must not be more than 1000 pF. For instance: Cables with 25 pF per foot may be 40 feet long. The input impedance of the power amplifier should be 47,000 ohms or more.

For best signal to noise ratio when using the MQ 101 between a preamplifier and power amplifier the input attenuator switch on the back panel of the MQ101 should be in the 0 dB position. When used with preamplifiers that have bass trim controls it is recommended that the bass trim controls be set in the flat position.

How to Connect



CONNECTING TO A RECEIVER USING TAPE MONITOR JACKS

Connect shielded cables between the tape outputs on the receiver and the MAIN inputs on the MQ101. Connect shielded cables from the MAIN outputs of the MQ101 to the tape monitor inputs on the receiver. The tape recorder can be connected to the tape monitor facilities on the MQ 101 in conventional fashion. The length of a connecting cable is limited by its electrical capacitance. The total capacity of each cable must not be more than 1000 pF. For instance: Cables with 25 pF per foot may be 40 feet long. The input impedance of the power amplifier should be 47,000 ohms or more.

The input attenuation switch on the back panel of the MQ101 should be in the —12 dB position to prevent the phono cartridge output from overloading the MQ101 at low frequencies.

PLEASE NOTE —TO USE THE MQ 101 THE TAPE MONITOR SWITCH ON THE RECEIVER MUST BE LEFT IN THE "IN" POSITION.

CONNECTING TO A RECEIVER WITH "PREAMP OUT/POWER AMP IN" FACILITIES

Connect shielded cables between the preamplifier output jacks and the MAIN inputs on the MQ 101. Connect shielded cables between the MAIN outputs on the MQ 101 and the power amplifier inputs on the receiver. When connected in this fashion make certain the input attenuation switch on the back panel of the MQ 101 is in the 0 dB position.

AC POWER OUTLET

The auxiliary AC power outlet can be used to supply power to other equipment in the system. The outlet is not switched nor is it fused in the MQ 101.

AC POWER

The MQ 101 operates on 117 to 130 volts, 50/60 Hz. It will be turned on and off when its power cord is plugged in one of the switched auxiliary AC power outlets in the program source.

FUSE

The MQ 101 uses a 0.5 Amp fuse. The auxiliary AC power outlet is not fused.

Using the Front Panel Controls

In McIntosh loudspeakers the characteristics of the speaker enclosure and the characteristics of the loudspeaker mechanisms have been combined to produce nearly perfect transient response. The design for excellent transient response has to compromise the system low frequency response. The most effective means of recovering a flat low frequency characteristic is the use of an electrically equalized speaker input signal. The McIntosh Environmental Equalizer does this job. Conventionally designed loudspeakers should not be used with the MQ 101 since it will overdrive them, distorting the sound and decreasing their useful life expectancy. McIntosh loudspeakers should not be used with other equalizers since they are designed for other applications and will not produce the low intermodulation characteristic and the proper frequency balance which is so important to McIntosh sound.

When a McIntosh Environmental Equalizer is properly connected in the stereo system all program material at all outputs except the tape output will be equalized.

TAPE MONITOR

The TAPE MONITOR is used only when the MQ 101 has been connected to the tape monitor facilities of the source equipment. The control is used in exactly the same fashion as the tape monitor control on the source equipment.

LOW FREQUENCY

A five position concentric switch selects from five different low frequency equalization curves, independently, in each channel. The outer knob adjusts the right channel response. The center knob adjusts the left channel response. Use low frequency equalization to compensate for the placement of the loudspeaker in your room. Position 1 modifies low frequency response least and position 5 has the greatest effect on low frequencies.

MID FREQUENCY

A five position switch selects from five different mid frequency equalization curves for both channels. Use mid frequency equalization to compensate for the effects of room acoustics and furnishings on the mid frequencies. Positions one and two select curves that decrease the amount of mid range loudness and positions four and five select curves that increase the amount of mid-range loudness. Position 3 is electrically flat.

HIGH FREQUENCY

A five position switch selects from five different high frequency equalization curves for both channels. Positions one and two select curves that decrease the high frequency loudness and positions four and five select curves that increase the high frequency loudness. Position 3 is electrically flat.

PANLOC

McIntosh developed PANLOC mounting brings professional installation technique to stereo. When the MQ 101 has been installed on PANLOC brackets, pressing the PANLOC buttons locks the equalizer firmly in. Depressing the buttons (as with a ballpoint pen) releases the instrument. The equalizer can then be slid forward for easy removal.

Performance Limits

PERFORMANCE GUARANTEE—Performance Limits are the maximum deviation from perfection permitted for a McIntosh instrument. We promise you that the MQ 101 you buy must be capable of performance at or exceeding these limits or you get your money back. McIntosh is the only manufacturer that makes this guarantee.

FREQUENCY RESPONSE: 0.5 dB from 20 Hz to 20,000 Hz

DISTORTION: 0.1% at rated output level, 20 Hz to 20,000 Hz

HUM AND NOISE: 80 dB below rated output (250 μV)

INPUT SENSITIVITY AND IMPEDANCE: Main and tape input 2.5 volts at 60,000 ohms for rated output at 1000 Hz

INPUT ATTENUATOR: Switched 0 dB, -6 dB, or -12 dB

OUTPUT: Main: 2.5 volts into 47,000 ohms or more, 20 to 20,000 Hz
Tape: 2.5 volts with rated input

EQUALIZATION: Low frequency: 0 to +17 dB at 20 Hz in 5 steps (0, +6, +9, +13, +17dB in positions 1, 2, 3, 4, 5, respectively)
Mid frequency: -5 to +5dB at 4000Hz in 5 equal steps
High frequency: -4 to +4dB at 20,000Hz in 5 equal steps

POWER REQUIREMENT: 120 volts, 50/60 Hz, 20 watts

MECHANICAL INFORMATION

SIZE: Front panel: 16 inches wide (40.64 cm) by 2-15/16 inches high (7.46 cm)
Chassis: 15 inches wide (38.1 cm) by 13 inches deep (33.02 cm) including PANLOC shelf and back panel connectors; Knob Clearance: 1½ inches (3.81 cm) in front of mounting panel

FINISH: Front Panel Anodized gold and black with special gold teal panel nomenclature illumination.

CHASSIS: Chrome and black

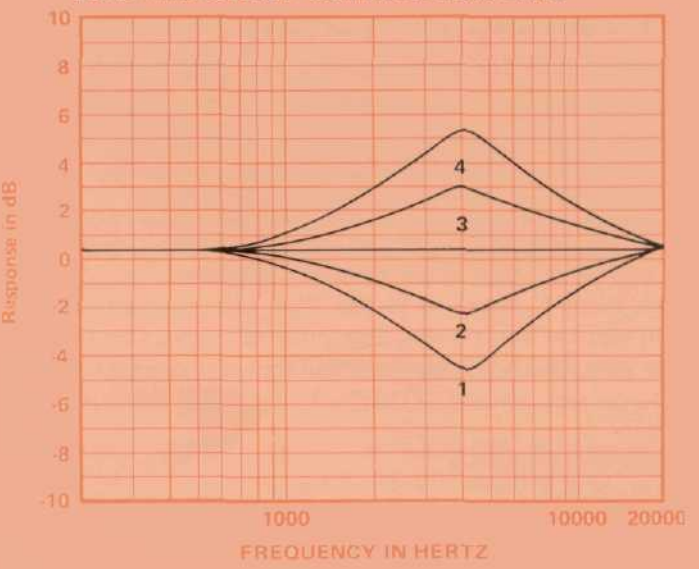
MOUNTING: McIntosh developed professional PANLOC

WEIGHT: 15 pounds (6.80 kg) net, 19 pounds (8.62 kg) in shipping carton

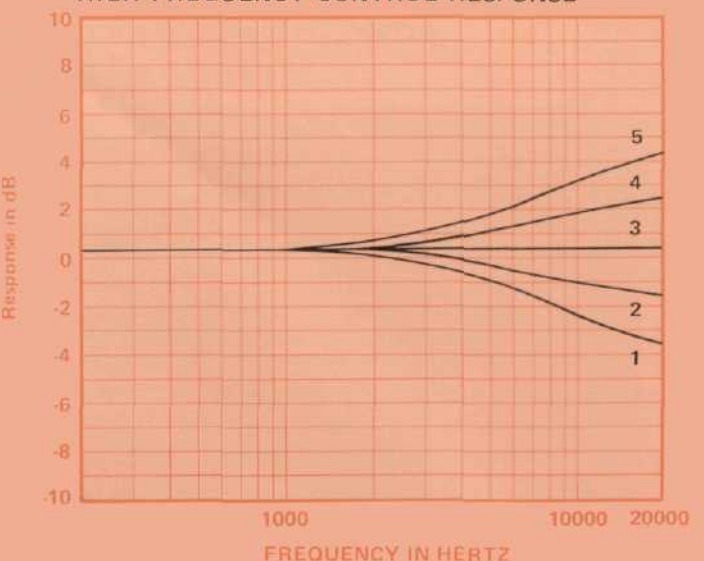
Performance Charts

MID FREQUENCY CONTROL RESPONSE

LOW FREQUENCY CONTROL RESPONSE



HIGH FREQUENCY CONTROL RESPONSE



Technical Description

DESIGNING FOR NATURAL BASS

Research programs have one common advantage for the alert scientist and engineer. The thousands of hours of effort, analysis, conjecture, and synthesis uncover opportunities to make meaningful contributions. Most of these opportunities are discovered just where lesser men saw only problems. One of the great opportunities that the McIntosh acoustics research team uncovered was a design for natural sound of bass instruments.

When a bass drum is struck, the motion of the diaphragm (drum head) pumps a large volume of air. The reproduction of such a sound image requires the motion of the same volume of air or, at least, a significant portion of it. Because the design objectives of low distortion and widely dispersed radiation dictate a maximum effective cone diameter of 10 inches the low frequency loudspeaker had to be designed with large excursion (back and forth movement) to achieve the air volume movement necessary. Our design objective was the development of a low frequency loudspeaker with a plus and minus one half inch cone excursion. Even with this large excursion, a straight line relationship between driving force and movement had to be maintained.

To achieve this linear relationship our engineers employed a long voice coil winding, a very light edge and centering suspension and an air spring. The air spring is the natural result of mounting the speaker in a relatively small air tight extremely rigid box. When the cone moves inward, it reduces the volume of air thereby increasing its pressure. The increased air pressure returns the cone to the center of its travel when the electrical signal returns to zero value. When the cone moves outward, the volume of air increases reducing the air pressure in the box. The air pressure in the room can now restore the cone to its center position when the electrical signal again reaches zero. One of the properties of an air spring is an almost perfectly straight line relation between volume and pressure for such small changes in volume. This insures a low level of distortion at low frequencies and also a low level of intermodulation distortion.

The linear air spring was combined with a stiff cone, a long voice coil winding and a very large and massive magnet structure to achieve almost perfect transient response for bass frequencies.

Design engineers, in the past, have not taken advantage of this opportunity to obtain excellent transient response because of the price that must be paid. That price is a reduction in bass response.

There are two ways around this problem of loss of bass. In the older technological approach to loudspeaker system design, flat frequency response was obtained by compromising the transient response using mechanical resonances in the speaker and its enclosure. This has been the traditional solution with its emphasis on cost reduction rather than reproduction accuracy.

The other solution is the new approach. To restore the system to a flat frequency response while preserving nearly perfect transient response, an electrical signal is supplied having an exactly opposite curve to the curve of the reduction in bass response.

Supplying this electrical signal introduces an equalizer into this system. The combination of the loudspeaker system and the equalizer produces both a flat response and an excellent transient characteristic, free of ringing, down to 20 Hz.

As if this advantage were not enough, the equalizer brings about another additional improvement to the system. The position of the loudspeaker in the room can substantially alter the loudspeaker's sound balance. The equalizer can be designed to compensate for different types of rooms and for different positions of the loudspeakers in these rooms.

DESIGNING FOR DIFFERENT LISTENING ROOMS

The power out of a bass speaker at very low frequencies varies over an 8 to 1 range (9 decibels) depending on where the speaker is positioned in the room.

For example if the loudspeaker enclosure is suspended in the center of a large, sound absorbing room, a 20 hertz signal will radiate equally in all directions from the loudspeaker. It will be radiating into a sphere.

If the loudspeaker enclosure is then lowered to the floor in the center of the room it would be radiating into a hemisphere. The signal striking the floor would be reflected upward and the speaker power output will appear to double.

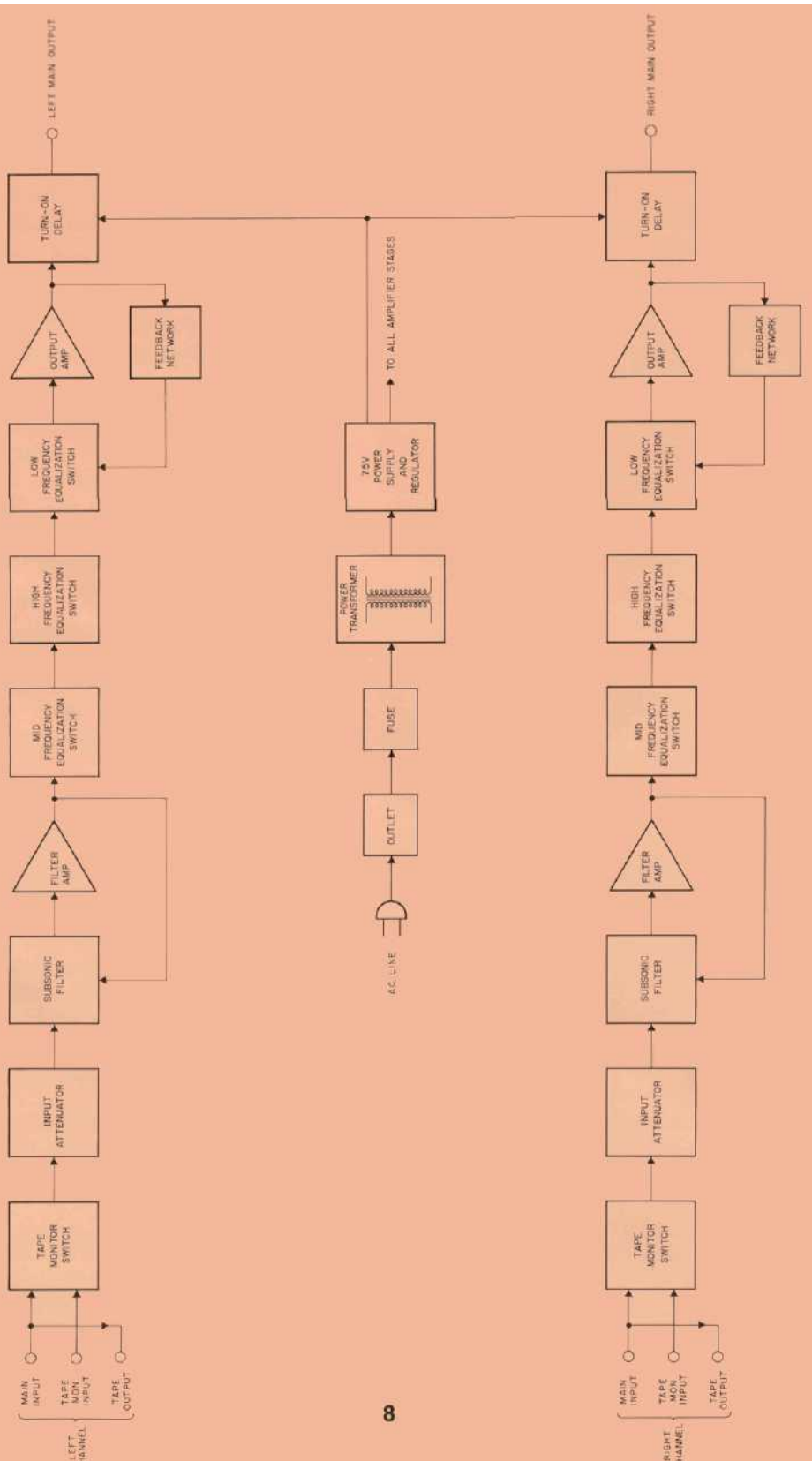
If the loudspeaker is then moved along the floor to the center of the wall the power will double again. The loudspeaker is then radiating into one quarter of a sphere.

Then by moving the loudspeaker into a corner of the room the radiation is concentrated into one eighth sphere with another apparent doubling in power.

We have designed five curvature rates in the environmental equalizer. They provide the electrical correction necessary to make a speaker sound as it would in a corner when it's mounted on a wall or vice versa. For stereo, individual left and right controls are provided to correct for different positions of the speakers in the room.

The MQ 101 in addition to the bass correction also provides correction for mid frequency and high frequency differences in rooms. Some rooms are very heavily draped and furnished. A room of this sort may need mid frequency and treble boost to make the music sound naturally alive. Other rooms are highly reflective due to using glass areas, smooth hard walls and concrete or tile floors. The opposite correction may be required to restore the music to the natural concert hall balance.

Block Diagram



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