

# McIntosh®

## STEREO PREAMPLIFIER

# C22



# OWNER'S MANUAL

C22



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## INTRODUCTION

The C22 Commemorative issue preamplifier and owner's manual are faithful reproductions of the original, produced from 1963 through 1968. A few changes were made to the original preamplifier design to reflect technology advances and contemporary system requirements.

Signal switching has been updated to Electromagnetic switches. Close tolerance film resistors and polypropylene capacitors add precision to equalizer, filter and tone control circuits. The tube complement retains the reliable 12AX7A for the amplifying stages. The cathode follower output stages are changed to 12AT7's to allow more current output to drive lower im-

pedance loads. Balanced audio outputs are added to take advantage of the greater noise reduction capabilities of Balanced cables. A built-in headphone amplifier provides headphone listening.

*This preamplifier is dedicated in remembrance of the late Frank H. McIntosh, founder of McIntosh Laboratory and co-inventor of the McIntosh Unity Coupled output circuit, which provided the foundation for the forming of the company. Mr. McIntosh was president of McIntosh Laboratory, Inc. from its inception in 1949 until his retirement in 1977.*

## GENERAL DESCRIPTION

The McIntosh C22 Stereophonic Preamplifier is a control center for any stereophonic sound system. To increase your enjoyment of stereo music, this control center does four jobs with great precision.

**First,** The control center amplifies weak electrical impulses. Phono signals are amplified 1000 times, while high level signals are amplified 10 times. As a record rotates on the turntable, undulations in the grooves move the pickup stylus approximately one thousandth of an inch, in any direction, from the rest position. From this slight mechanical movement, the pickup stylus generates a weak electrical impulse on the order of a few thousandths of a volt. To amplify and preserve the information in such a small electrical impulse, the finest amplifier performance is required.

**Second,** Every sound system is used in a different environment. The tone balance of the music is affected by variations in the environment. Also, people listening to the music have varying ideas of correct tone balance. To com-

pensate for these conditions, a high-quality tone control center is needed.

**Third,** All stereophonic and monophonic phono records, both domestic and foreign, are recorded with specific frequency equalization. The control center must accurately compensate for this equalization introduced in the recording process.

**Fourth,** programs can originate from several sources such as tuners, records, tape recorders, CD players, etc. A control center is needed to select and switch these sources separately, or in combination.

**All these jobs are performed with excellence by the C22.**

Once you have enjoyed the outstanding performance of the C22, you will understand why McIntosh products have earned their reputation as "THE BEST". Your McIntosh C22 Stereophonic Control Preamplifier will give you years of the finest possible performance, and will become a highly valued part of your home music system.

## TECHNICAL DESCRIPTION

The C22 Stereophonic Preamplifier combines excellence with the ease of operation. The most often used controls have large diameter knobs. A new type of rocker switch is used for controls with simple on-off functions. The C22 has an illuminated front panel to provide convenient reading under low level lighting conditions. The Mode and Input Selector switch positions are also illuminated.

The C22 circuit consists of three amplifier sections in duplicate for left and right stereo channels, together with a common power supply. The first amplifier section is referred to as the Phono Preamplifier and is used to amplify and equalize signals from a moving magnet phono cartridge. Skillful circuit layout, proper grounding and adequate shielding reduce hum to such a low level that it is virtually immeasurable. Extreme care in manufacturing combined with low noise tubes, high specific resistivity circuit boards and metal film resistors results in extremely low noise levels.

The second amplifier section follows the main volume control, making it impossible to overload the high level input circuits. The same design techniques as used in the phono preamplifier section, follow the main volume control, making it impossible to overload the high level input circuits.

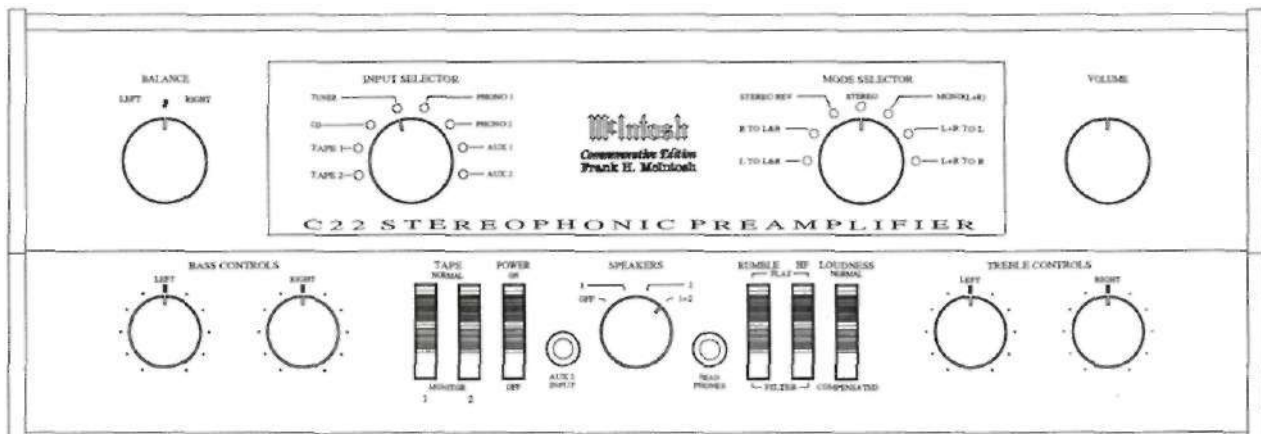
The same design techniques as used in the phono preamplifier section ensure low noise and hum. The BASS and TREBLE feedback type tone controls operate within this section. The tone controls are multi-position switches with approximately 4dB change per step. Exceedingly low distortion and precise control of frequency response contour are assured with this type of design.

The third amplifier section is the cathode follower output. The sharp cutoff (18dB per octave) RUMBLE and HF (High Frequency) filters are also associated with this section. The cathode followers drive the Unbalanced Main Outputs, and the positive (+) Balanced Outputs. Unity gain phase inverters drive the negative (-) Balanced Outputs.

The power supply deserves special mention. The power transformer is constructed with grain oriented laminations and magnetic shielding, for low external hum fields. Long life full wave bridge rectifiers, filter capacitor sectionalizing and careful grounding add to the hum-free, long life of the C22.

Special attention has been given to the mechanical design. The C22 may be conveniently installed in furniture cabinets, custom built installation or in an attractively finished McIntosh cabinet.

## FRONT PANEL FACILITIES



## INPUT SELECTOR

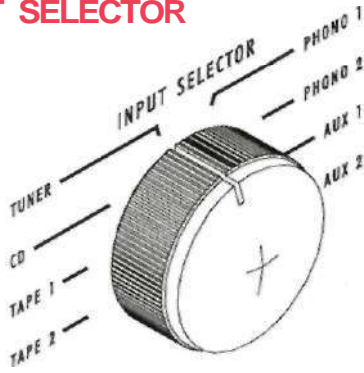


Fig. 2 - INPUT SELECTOR Switch.

Select any one of eight program sources with this switch.

1. TAPE 1: A tape recorder with its outputs connected to the TAPE 1 input.
2. TAPE 2: A tape recorder with its outputs connected to the TAPE 2 input.
3. CD: A CD player or changer with its outputs connected to the CD inputs.
4. TUNER: A stereo AM/FM tuner with its outputs connected to TUNER inputs.
5. PHONO 1: A record player with MM cartridge connected to PHONO 1 inputs.
6. PHONO 2: A record player with MM cartridge connected to PHONO 2 inputs.
7. AUX 1: Any auxiliary high level output signal such as a tuner or TV audio.
8. AUX 2: Same as AUX 1.

## MODE SELECTOR

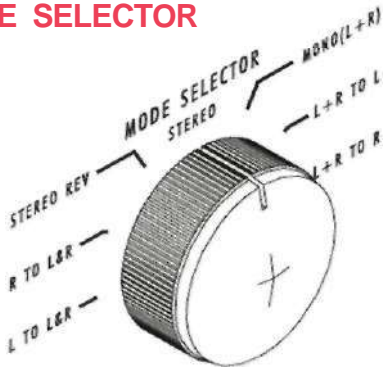


Fig. 3 - MODE SELECTOR Switch.

Use the MODE SELECTOR to:

Listen to normal stereo.

Reverse the left and right arrangement of musical instruments.

Balance the amplifiers and loudspeakers in a stereo system.

Listen to monophonic sound.

Listen through both loudspeakers to either rack of a stereo program source.

Turn the MODE SELECTOR to:

1. L TO L & R: connects the "left" input to both loudspeakers.

2. R TO L & R: Connects the "right" input to both loudspeakers.

3. STEREO REV: Connects the "left" input to the "right" loudspeaker and the "right" input to the "left" loudspeaker.

4. STEREO: Connects the "left" input to the "left" loudspeaker and the "right" input to the "right" loudspeaker.

5. MONO (L + R): Adds the "left" input and the "right" input and then connects the L + R program to both amplifiers and loudspeakers.

6. L + R TO L: Connects the "left plus right" programs to the "left" loudspeaker only.

7. L + R TO R: Connects the "left plus right" programs to the "right" loudspeaker only.

## VOLUME



Fig. 4 - VOLUME CONTROL

Use the VOLUME control to regulate the combined volume level of both channels. Turning the VOLUME control clockwise increases volume level.

## BALANCE



Fig. 5 - BALANCE CONTROL

Use the C22 BALANCE control to balance unequal volume in the left and right channels of a program source. The volume of each speaker system relative to the other can be varied. At the same time their combined volume level is maintained.

LEFT: Turning the control to the left accents the left channel by reducing the right channel output.

RIGHT: Turning the control to the right accents the right channel by reducing the left channel output.

## BASS CONTROLS

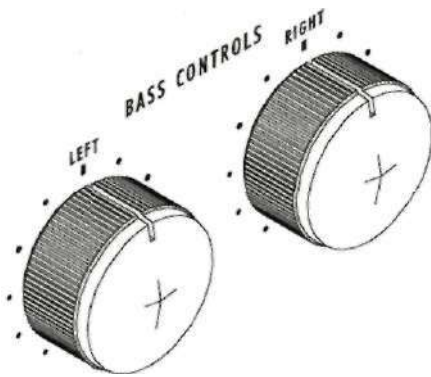


Fig. 6 - BASS CONTROLS

Use the LEFT and RIGHT BASS CONTROLS to regulate bass loudness to the left and right speakers, respectively. Clockwise rotation increases bass loudness; counterclockwise rotation decreases bass loudness. Each switch step of the BASS control changes bass loudness approximately 4dB.

## TREBLE CONTROLS

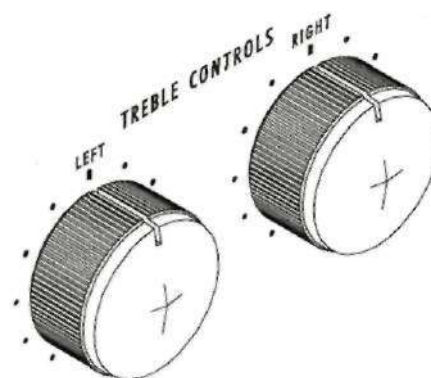


Fig. 7 - TREBLE CONTROLS

Use the LEFT and RIGHT TREBLE CONTROLS to regulate treble loudness to the left and right speaker, respectively. Clockwise rotation increases treble loudness; counterclockwise rotation decreases treble loudness. Each switch step of the TREBLE control changes treble loudness approximately 4dB.

## POWER

Press the POWER switch to turn on and off the C22 and the four switched AC receptacles on the back panel.

## TAPE

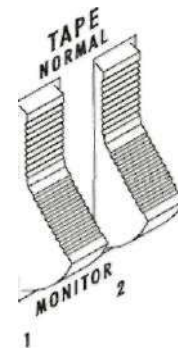


Fig. 8 - TAPE MONITOR Switches.

The two C22 TAPE MONITOR switches allow you to listen to playback of tapes from either of two tape recorders. You can listen to previously recorded tapes or monitor the recorded tape from a three head tape recorder during the actual recording process. When either TAPE switch is set to MONITOR, the program source will be the tape playback, regardless of the setting of the INPUT SELECTOR switch. In the NORMAL switch positions the program source selected by the INPUT SELECTOR is heard.

## RUMBLE

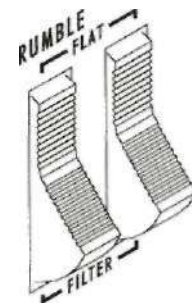


Fig. 9 - RUMBLE Filter Switch.

Use the RUMBLE filter to reduce low frequency noise created by a turntable or record changer and acoustically coupled feedback. FLAT: Filter disconnected. FILTER: Low frequency rumble noise below 30Hz created by a turntable or record changer and acoustically coupled feedback are reduced when the RUMBLE filter button is pushed to the filter position.

## HF (HIGH FREQUENCY FILTER)

This switch minimizes surface noise when reproducing old, badly worn recordings.

FLAT: Filter disconnected

FILTER: Rolls off response sharply at 7kHz.

## LOUDNESS

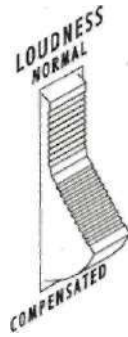


Fig. 10 - LOUDNESS Switch.

Use the LOUDNESS switch in the COMPENSATED position to listen at low volume and still hear full frequency range. When you turn down the volume, the music will seem to lose much of its bass. This effect is due to the sensitivity characteristics of human hearing. The response of the human ear to bass pitch decreases more rapidly than its response to notes centered in the midtonal range. The LOUDNESS switch automatically provides the correct amount of bass boost required to compensate for this change in response for the human ear at low loudness levels. When the LOUDNESS switch is moved to the COMPENSATED Position, it converts the volume control to a loudness compensated control.

## SPEAKERS

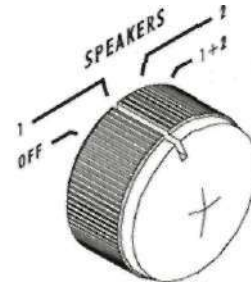


Fig. 11 - SPEAKERS Switch.

The front panel SPEAKER 1 and 2 switch operates the rear panel SWITCHED 1 and 2 outputs, as well as switching two pairs of speakers when the optional SCR3 SPEAKER CONTROL RELAY is added to the C22. You can turn on either SPEAKERS 1 or 2 separately, or both simultaneously. Use the switch and relay combination to turn off the speakers when head phone listening is desired.

## INSTALLATION

The C22 can be installed upright on a shelf or table, standing on its own plastic feet or mounted in a McIntosh equipment cabinet. It can also be custom installed in a piece of furniture or cabinet of your choice.

The trouble free life of any electronic instrument is greatly extended by providing sufficient ventilation for adequate cooling. Always provide adequate ventilation for your C22, even though it develops very little heat.

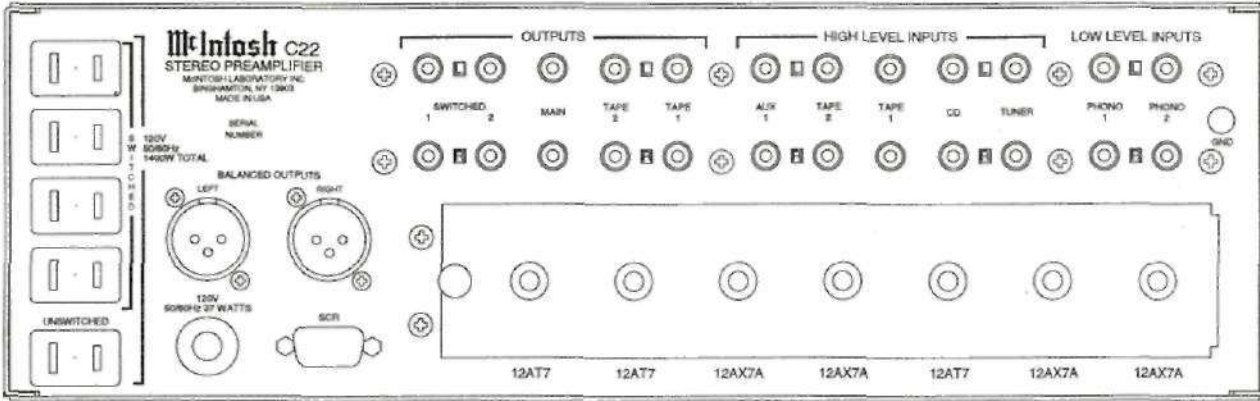
If you choose to install your C22 in a McIntosh cabinet, slide it into the cabinet from the front. The unit is secured by inserting two 10-32 screws and washers, (not supplied), extending up through holes in the cabinet shelf and into threaded receptacles in the C22 bottom panel.

A custom cabinet installation should provide the following recommended minimum spacing dimensions for cool operation. Allow at least 1-1/2" (3.8cm) above the unit so airflow is not

obstructed. Allow 14" (35.6cm) depth behind the mounting panel, which includes clearance for connectors. Allow 1-1/8" (2.9cm) in front of the mounting panel for knob clearance. The plastic feet must be removed from the bottom of the C22 for a cabinet installation. It is also recommended that a ventilation hole be cut out in the mounting shelf below the preamplifier to ensure adequate ventilation. Refer to the Custom Mounting drawings found on page 10 further back in this manual, for mounting details.

Do not install your C22 directly above a heat generating component such as a high power amplifier. In a system stack, the power amplifier should always be at the top. If all the components are installed in a single cabinet, a quiet running ventilation fan can be a definite asset in maintaining all the system components at their coolest possible operating temperature.

## CONNECTING



### AC POWER CONNECTIONS

There are five AC outlets on the rear panel of the C22. These receptacles have a maximum total rating of 1,400 watts (11.6 amperes). The four top receptacles are switched on and off with the C22 front panel Power Switch. The bottom receptacle is unswitched, and stays on as long as the C22 power cord is connected to a live AC outlet. This receptacle is used for powering a turntable or record changer. This feature

allows the record player to turn off with its own control switch, even though the C22 power switch has been turned off. A turntable or record changer is then allowed to complete its cycle and disengage any idler wheels to prevent mechanical damage to the unit.

Plug the AC power cord into a wall outlet that supplies 120 volts at 50Hz or 60Hz. The C22 draws 37 watts to 120 volts.

### INPUT CONNECTIONS

The C22 provides eight separate inputs controlled by the INPUT SELECTOR switch. The two

TAPE inputs can also be selected by the TAPE MONITOR switches.

CONNECTION	FUNCTION	INPUT SENSITIVITY	INPUT IMPEDANCE
TAPE 1 & 2	The tape inputs accept signals from tape recorders	0.25V	22K
CD	The CD input accepts signals from a CD player	0.25V	22K
TUNER	The Tuner input accepts AM and FM outputs from a stereo tuner.	0.25V	22K
PHONO 1 & 2	These jacks are to be used with magnetic cartridges.	2.2mV	47K
AUX 1 & 2	The auxiliary inputs accept any auxiliary source requiring flat frequency response, such as a TV set, tuner, tape recorder with its own playback amplifier, etc.	0.25V	22K

If a phono cartridge requires less than 47,000 ohms load impedance, a resistor can be added across terminals of the cartridge to achieve the

correct termination. The following chart may be used as a guide:

Desired Impedance	Resistor Across Cartridge
47,000 ohms (47K)	No resistor
37,000 ohms (37K)	180,000 ohms (180K)
27,000 ohms (27K)	62,000 ohms (62K)
15,000 ohms (15K)	22,000 ohms (22K)
6,800 ohms (6.8K)	8,200 ohms (8.2K)



## OUTPUT CONNECTIONS

There are five pairs of Unbalanced outputs on the C22 rear panel. These are labeled SWITCHED 1, SWITCHED 2, MAIN, TAPE 1 and TAPE 2. There is also a pair of BALANCED Outputs.

Connect the MAIN OUTPUTS to the inputs of a power amplifier. The MAIN OUTPUTS function whenever the C22 is on and operating.

The SWITCHED 1 and SWITCHED 2 OUTPUTS may be connected to the inputs of power amplifiers. These two outputs turn on only with the front panel SPEAKERS switch. You can turn on either pair of outputs independently, or both simultaneously. If the optional SCR3 SPEAKER CONTROL RELAY is connected to the C22, it will also be controlled by the SPEAKERS switch and allow you to turn two pairs of speakers on and off in a similar configuration.

The input impedance of power amplifiers used with the C22 should be 10,000 ohms or greater.

Connect the TAPE 1 and TAPE 2 Outputs to the high level inputs of a tape recorder. The TAPE Outputs are not affected by the VOLUME

control, the BALANCE control, the MODE switch, the BASS and TREBLE switches, the HF and RUMBLE switches and the LOUDNESS switch. The audio signals present at the TAPE Outputs are determined by the setting at the INPUT SELECTOR switch.

When the balanced output is to be used connect cables with XLR type Balanced Connectors from the C22 LEFT and RIGHT BALANCED OUTPUT jacks to the balanced input jacks of the power amplifier. Using balanced connectors and cables can reduce noise and interference by as much as 40dB. This extra noise reduction can be a significant improvement, especially if the cables are quite long. If cable lengths between the C22 and the power amplifiers are short (one meter or less), you will probably find high quality unbalanced cables to be equally satisfactory.

Balanced Jack Pin Configurations:

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

## GROUND CONNECTION

A single ground post is provided. The chassis ground from turntable, record changers, tape decks, etc., should be returned to this post. Do not duplicate this ground circuit with a second ground connection. Hum is likely to be heard in the system if duplicate ground returns are used.

The left and right program cables from each

source should be twisted together and the ground wire from each source can be wound or twisted in with these cables. To avoid hum, make sure the ground wire does not make any connections to shields of the left and right channel cables except for the connection provided with the C22 ground post.

## OPERATING INSTRUCTIONS

### BALANCING A STEREO SYSTEM

The performance and enjoyment of a stereo system is greatly increased when the system is properly balanced. There are two factors that require balancing. One is the unequal program loudness on the left and right channels of a program source. The control marked BALANCE on the C22 is used to balance unequal program loudness. Balancing a program for unequal loudness is explained under ADJUSTING BALANCE CONTROL.

The other factor that requires balancing is the system balance. The balance of a stereo system is affected by many things including room acoustics, furniture placement, room shape, small differences in loudspeakers, etc. Balancing the system is done by adjusting the controls on the power amplifiers. If the power amplifier has no input level controls, it will be necessary to use the C22 balance control to balance the system.

To begin balancing the system, check to see that the controls on the amplifier are properly set. If the amplifier is a McIntosh MC275, set the input switch to STEREO. Turn both input level controls to the 2.5V position.

1. Play a familiar program source such as a CD, record or FM broadcast.
2. Turn the BASS CONTROLS and TREBLE CONTROLS so that the knob indicators are centered under the panel marking L and R.
3. Turn the BALANCE control to the center or 12 o'clock position.
4. Place the LOUDNESS switch in the NORMAL Position.
5. Place the TAPE switches in the NORMAL position.
6. Place the RUMBLE filter switch in the FLAT position.
7. Place the HF cutoff filter switch in the FLAT position.
8. Turn the MODE SELECTOR to the L + R TO L position.
9. While the program is playing, alternate the MODE SELECTOR between the L + R TO R and the L + R TO L position. On the power amplifier adjust the correct gain control until the left and right loudspeakers are of equal loudness.

The stereo system is now balanced. It will remain balanced through all modes of operation.

### ADJUSTING THE BALANCE CONTROL AFTER THE SYSTEM HAS BEEN BALANCED

When these instructions have been completed, the overall system is balanced; ready to deliver maximum pleasure and enjoyment.

You may hear differences in balance from one record or CD to another or from one tape to another. Some records, CD's or tapes may be recorded with slight differences between channels. The differences can be corrected with the BALANCE control on the front panel. If the difference is heard on every record, then the cartridge may have a very small difference in output.

### ADJUSTING FOR SPECIAL EFFECTS

#### HF CUTOFF FILTER

If you wish to reproduce old, badly worn records, you can minimize the surface noise by switching the HF cutoff filter to the IN position.

#### RUMBLE FILTER

If you are using a turntable or changer which has low frequency rumble noise, you may reduce it by pushing the RUMBLE filter switch to the FILTER position.

### BASS CONTROLS AND TREBLE CONTROLS

The tone balance which you hear when listening to an orchestra is affected by the conductor's instructions to his musicians, the acoustical environment in which you are listening, and your own subjective hearing interpretation. Considering these conditions, it is easy to see why tone balance controls play a major role in correcting for the following factors.

1. Each person's subjective idea of tone balance.
2. Loudspeaker frequency response characteristics.
3. Loudspeaker placement in the listening room.
4. The conductor's idea of tone balance at the time the recording was made.
5. The microphone frequency response characteristics.
6. The recording process influences.

These factors can be considered as environmental influences. The BASS CONTROLS and TREBLE CONTROLS provide a degree of compensation for effects on environment. Listen to your system with each control set with the indicators centered between the panel markings L and R. If you wish to reduce treble in relation to bass for example, turn the TREBLE CONTROLS counterclockwise until the tone balance sounds correct to you. These controls will modify tone balance without introducing any undesirable effects. Do not be surprised if you find your preference in tone changing from time to time.

### LOUDNESS

Due to selective shift in sensitivity of human hearing, music reproduced at very low volume loses its bass.

The LOUDNESS switch on the C22 changes the VOLUME control to a loudness compensated control to correct for this effect. When you wish to listen to music at greatly reduced loudness level and yet hear bass in its proper relationship, set the LOUDNESS switch to the IN position.

#### **LISTENING TO A STEREO TUNER**

1. Turn the INPUT SELECTOR to TUNER.
2. Turn the MODE SELECTOR to STEREO.
3. Set the HF cutoff filter switch to FLAT. (See ADJUSTING FOR SPECIAL EFFECTS.)
4. Set the RUMBLE filter switch to FLAT. (See ADJUSTING FOR SPECIAL EFFECTS.)
5. Set the LOUDNESS switch to NORMAL. (See ADJUSTING FOR SPECIAL EFFECTS.)
6. Turn the BASS CONTROLS and TREBLE CONTROLS so that the indicators are centered between the panel markings L and R. (See BASS AND TREBLE CONTROLS.)
7. Set the TAPE switches to NORMAL.
8. Adjust the VOLUME control to the desired volume.

Turn the tuning knob on your tuner to find the station of your choice.

#### **LISTENING TO A STEREO RECORD**

To listen to stereo records, proceed as follows:

1. Turn the INPUT SELECTOR to PHONO 1 or PHONO 2, whichever is connected to the cartridge you wish to hear.
2. Set the MODE SELECTOR to STEREO.
3. Set the HF cutoff filter to FLAT. (See ADJUSTING FOR SPECIAL EFFECTS.)
4. Set the RUMBLE filter control to FLAT. (See ADJUSTING FOR SPECIAL EFFECTS.)
5. Set the LOUDNESS control to NORMAL. (See ADJUSTING FOR SPECIAL EFFECTS.)
6. Set the TAPE switches to NORMAL.
7. Set the BASS CONTROLS and TREBLE CONTROLS so that the indicators are centered between the panel markings L and R. (See BASS AND TREBLE CONTROLS.)
8. Adjust the VOLUME control to the desired volume.

#### **LISTENING TO MONOPHONIC RECORDS**

To listen to monophonic records, proceed as follows:

1. Turn the INPUT SELECTOR to PHONO 1 or PHONO 2, whichever is connected to the cartridge you wish to hear.
2. Set the MODE SELECTOR to MONO (L + R).
3. Set the HF cutoff filter to FLAT. (See ADJUSTING FOR SPECIAL EFFECTS.)
4. Set the RUMBLE filter control to FLAT. (See

ADJUSTING FOR SPECIAL EFFECTS.)

5. Set the LOUDNESS control to FLAT. (See ADJUSTING FOR SPECIAL EFFECTS.)
6. Set the TAPE switches to NORMAL
7. Set the BASS CONTROLS and TREBLE CONTROLS so that the indicators are centered between the panel markings L and R. (See BASS AND TREBLE CONTROLS.)
8. Adjust the VOLUME control to the desired volume.

#### **LISTENING TO A STEREO TAPE RECORDING**

A stereo tape recorder should be plugged into the TAPE 1 or 2 input. Proceed as follows:

1. Turn the INPUT SELECTOR TAPE.
2. Set the MODE SELECTOR to MONO (L + R) or STEREO depending on the program on the tape.
3. Set the HF cutoff filter to FLAT. (See ADJUSTING FOR SPECIAL EFFECTS.)
4. Set the RUMBLE filter control to FLAT. (See ADJUSTING FOR SPECIAL EFFECTS.)
5. Set the LOUDNESS control to NORMAL. (See ADJUSTING FOR SPECIAL EFFECTS.)
6. Set the TAPE switches to NORMAL.
7. Set the BASS CONTROLS and TREBLE CONTROLS so that the indicators are centered between the panel markings L and R.
8. Adjust the VOLUME control to the desired volume.

#### **LISTENING TO AUXILIARY INPUT SIGNALS**

If the AUX 1 or 2 input is used, turn the INPUT SELECTOR to AUX 1 or 2: then proceed the same as for TAPE input.

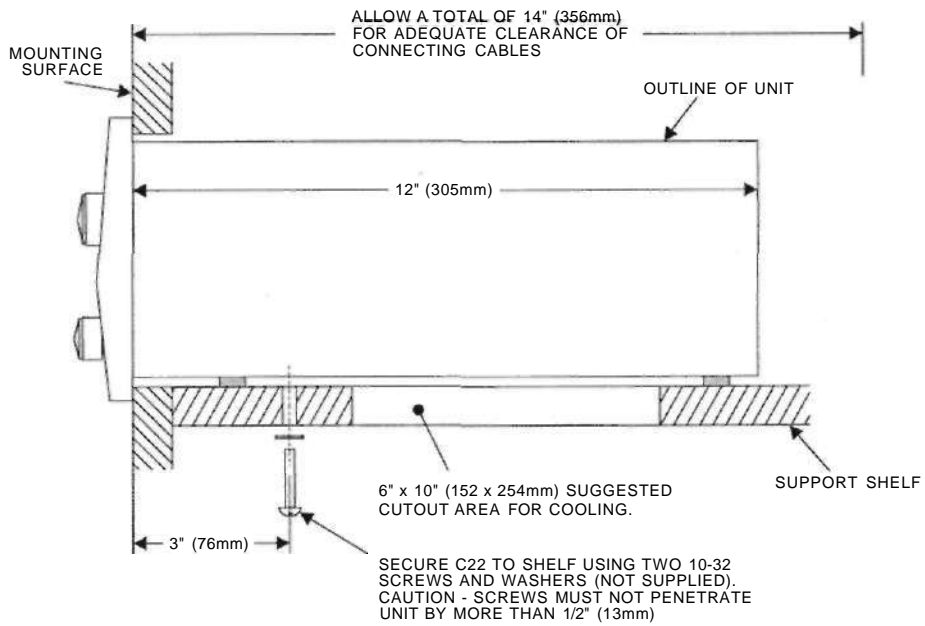
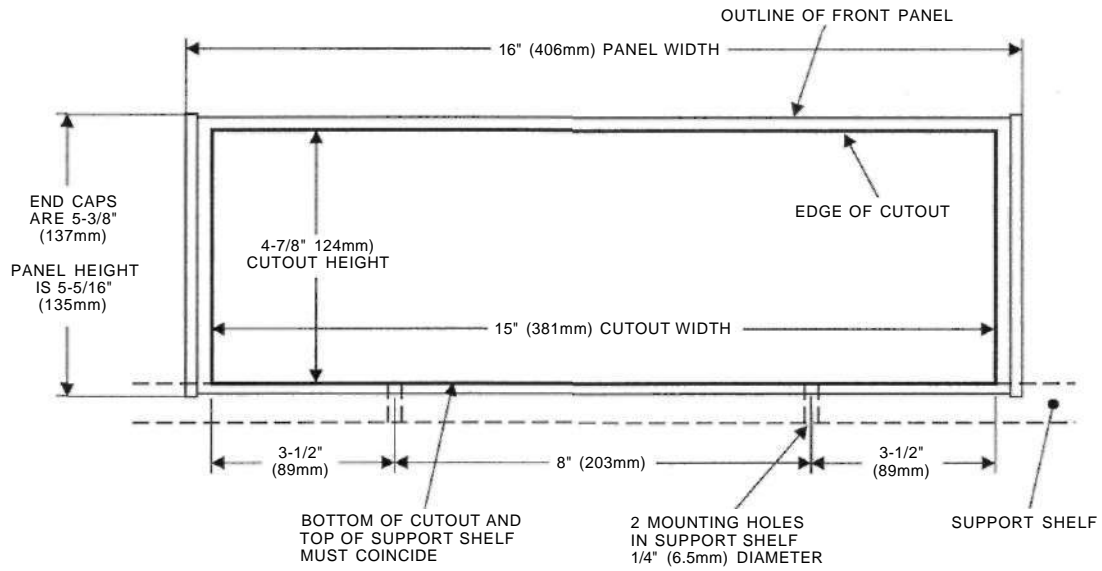
#### **FRONT PANEL AUX 2 INPUT**

A front panel AUX 2 (Auxiliary) input jack is provided to use with any accessory component with a high level output such as a tape recorder or CD player. This input makes it convenient to temporarily connect a component that is not permanently connected to the back panel. This jack uses a standard 1/4" stereo phone plug.

#### **FRONT PANEL HEADPHONES JACK**

Connect a pair of dynamic headphones to the front panel HEADPHONES jack for private listening. The HEADPHONES output is the same signal as the MAIN outputs. Turn off the loudspeakers for headphone listening by connecting the system power amplifier to the SWITCHED OUTPUT 1 or 2 or by adding the optional SCR3 SPEAKER CONTROL RELAY and then turn the front panel SPEAKERS switch off.

## C22 CUSTOM MOUNTING



## C22 PREAMPLIFIER SPECIFICATIONS

### FREQUENCY RESPONSE

+0, -0.5dB from 20Hz to 20,000Hz

### RATED OUTPUT

2.5V at MAIN, SWITCHED 1 and 2 and  
BALANCED OUTPUTS

### MAXIMUM VOLTAGE OUTPUT

More than 8V at all outputs

### TOTAL HARMONIC DISTORTION

0.02% maximum IHF, 0.2% maximum from  
20Hz to 20,000Hz at rated output.

### SENSITIVITY

Phono: 2.2vM for 2.5V rated output,  
(0.45mV IHF)

High Level: 250mV for 2.5V rated output,  
(50mV IHF).

### SIGNAL-TO-NOISE RATIO, A-WEIGHTED

Phono: 80dB below 10mV input

High Level: 90dB below rated output.

### INPUT IMPEDANCE

Phono: 47K ohms and 65pf capacitance

High Level: 22 ohms

### VOLTAGE GAIN

Phono to Tape: 41dB at 1000Hz

Phono to Main: 61dB at 1000Hz

High Level to Tape: 0dB

High Level to Main: 20dB

### tone controls

Bass and Treble stepped, 20dB boost to 20dB  
cut.

### AC POWER OUTLETS

4 switched and 1 unswitched, total capacity  
1400 watts.

### POWER REQUIREMENTS

120V, 50/60HZ, 37 watts

### DIMENSIONS

Front Panel: 16" (40.6cm) wide by 5-7/16"  
(13.8cm) high. Chassis depth behind mounting  
panel, including clearance for connectors: 14"  
(35.6cm). Knob clearance required in front of  
mounting panel: 1-1/2" (3.8cm).

### FINISH

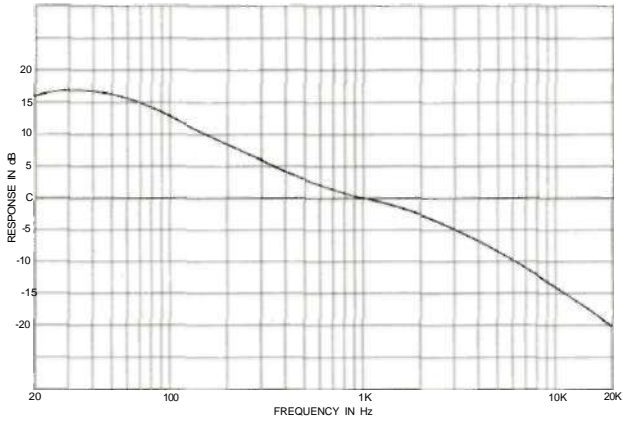
Anodized gold and black front panel.

### WEIGHT

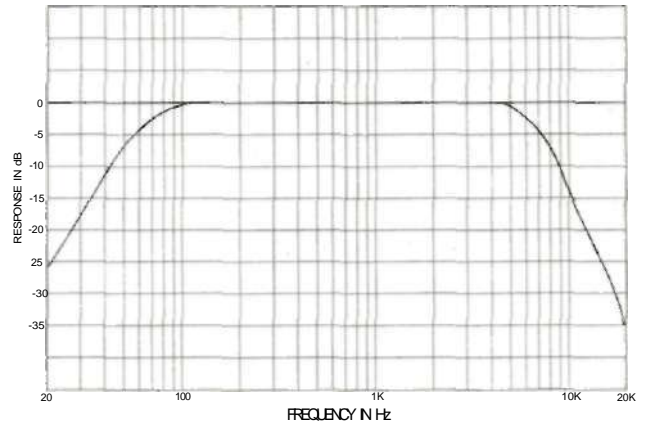
16 lbs. (7.3Kg) net, 22 lbs. (11.3Kg) in shipping  
carton.

# OPERATING CURVES

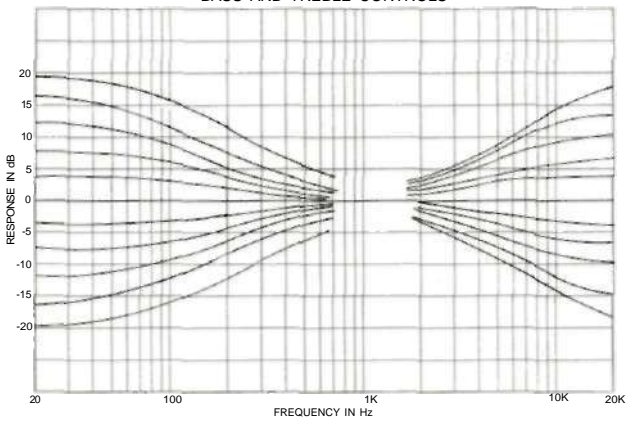
### PHONO EQUALIZATION



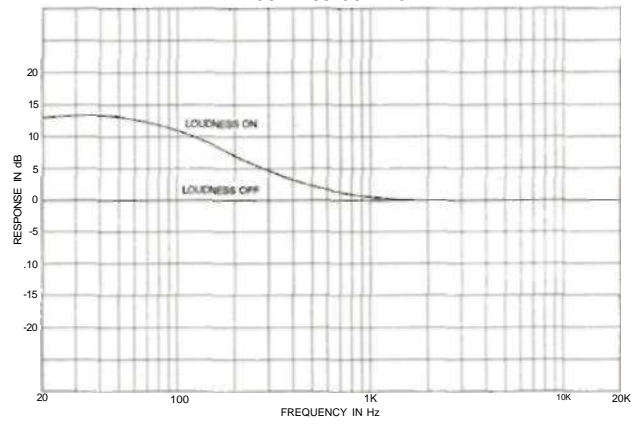
### RUMBLE AND HF FILTERS



### BASS AND TREBLE CONTROLS



### LOUDNESS CONTROL



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

Your C22 Stereophonic Preamplifier 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 charge. The service contract does not cover any shipping costs to and from 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 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.

\*Vacuum tubes are guaranteed for 90 days only.

**McIntosh**<sup>®</sup> **LABORATORY INC.**

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