



McIntosh Laboratory, Inc. 2 Chambers Street Binghamton, New York 13903-2699 Phone: 607-723-3512 www.mcintoshlabs.com



MC901

Dual Mono Amplifier

Owner's Manual



The MC901 Dual Mono Amplifier is the first of its kind. Amplifier drawn from McIntosh's long tradition of uncompromising tube and solid-state Amplifiers. The MC901 combines the finest aspects of tube and solid-state Amplifier to drive even the most power-hungry Loudspeakers to peak performance.

Safety First

Please read all the enclosed MC901 SAFETY INFORMATION included in separate documents. You can never be too safe.

Thank you from all of us at McIntosh

You have invested in a precision instrument that will provide you with many years of enjoyment. Please take a few moments to familiarize yourself with the features and instructions to get the maximum performance from your equipment.

If you need further technical assistance, please contact your dealer who may be more familiar with your particular setup including other brands. You can also contact McIntosh with additional questions or in the unlikely event of needing service.

McIntosh Laboratory, Inc.
 2 Chambers Street
 Binghamton, New York 13903
 Technical Assistance: (607) 723-3512
 Customer Service: (607) 723-3515
 Fax: (607) 724-0549
 Email: support@mcintoshlabs.com
 Website: mcintoshlabs.com

Make a Note

For future reference, you can jot down your serial number and purchase information here. We can identify your purchase from this information if the occasion should arise.

Serial Number:	
Purchase Date:	
Dealer Name:	

Table of Contents

Safety First.....	2
Thank you from all of us at McIntosh.....	3
Make a Note.....	3
One of a Kind	4
What is in the box.....	5
Where to put it.....	5
Removal of Foam Inserts over Vacuum Tubes.....	5
Rear Connections and Switches	6
Connections on the Back	7
AC Power.....	7
Input Mode.....	7
Input Select Switch	7
Balanced and Unbalanced Inputs	7
Composite or Direct Inputs.....	7
Power Control	8
Auto Off Switch.....	8
Connecting a Speaker.....	8
A Question of Impedance.....	8
The Speaker Wire	8
The Output Terminal Hookup	8
Remove Loudspeaker Jumpers.....	9
Sentry Monitor.....	10
Quad Balanced.....	10
Circuit Breaker	10
MC901 Connection Diagram.....	11
Setting the Filters.....	12
Low Pass Filter	12
High Pass Filter	12
Setting the Level Adjust	12
Vacuum Tubes Used in the MC901	12
The Front of the MC901	13
The Dual Meter.....	13
Meter Control Knob.....	14
Power Control Knob	14
Power Guard LED.....	14
Power Guard Screen Grid Sensor (SGS) LED.....	14

Repacking the MC901	15
Roll-off for Crossover Points	16
Roll-off for 1K Crossover Point.....	18
Solid State Specifications	19
Vacuum Tube Specifications	19
General Specifications.....	19

List of Figures

Figure 01– Removing Tube Cover Screws	5
Figure 02– Remove Protective Foam	5
Figure 03– Tubes Revealed.....	5
Figure 04– Rear View	6
Figure 05– XLR Pin Configuration	7
Figure 06– Power Control (trigger) mini plug.....	8
Figure 07– Loudspeaker Wire Gauge Guide.....	8
Figure 08– Opening Output Terminal.....	9
Figure 09– Tightening Output Terminal	9
Figure 10– Terminal Connection Covers	9
Figure 11– Terminal Connection Cover openings.....	9
Figure 12– Circuit Breaker	10
Figure 13– MC901 Connection Diagram	11
Figure 14– EQ Knobs	12
Figure 15– Vacuum Tube Positions	13
Figure 16– Dual Meter	13
Figure 17– Front Knobs and LEDs	14
Figure 18– Roll-Off for Low Pass Filter	16
Figure 19– Roll-Off for High Pass Filter	17
Figure 20– 1K Roll-off Combined Graph	18



One of a Kind

The MC901 Dual Mono Amplifier has been designed to be the ultimate solution for bi-amping Loudspeakers. It's the best answer in the quest to capture the harmonic beauty of Vacuum Tubes for a Loudspeaker's mid and upper registers while still having an abundance of power dedicated to the power-hungry woofers. To bi-amp in the past, two separate Amplifiers were required, but now the MC901 does the work of two separate Amplifiers with its optimized combination of a Tube and a Solid State Amplifier happily co-existing as a single optimized instrument. Previously, crossover points would have to be handled outside of the Amplifier and a lot of trial and error would be required to properly setup two Amplifiers that were not designed to work together.

The MC901 is the perfect solution for bi-amping speakers. 300 Watts of Vacuum Tube power are available to drive your Loudspeaker's midranges and tweeters. Vacuum Tubes do not perform optimally when amplifying frequencies that are not used by the Loudspeaker. To maximize the Tubes' power, the MC901's internal, adjustable crossover assures the Tubes will only be powering the frequencies that the Loudspeakers will be reproducing. With the MC901, the Tubes will not be challenged or overloaded by low-end reproduction because the Solid State section has 600 Watts dedicated to driving the low end, and the adjustable filters assure that each Amplifier section handles only the frequencies that they are intended to amplify. Full power of each Amplifier section is available whether you are using 2, 4 or 8 Ohm Loudspeakers thanks to our Unity Coupled Circuit Output Transformer and Autoformer™.

McIntosh's Unity Coupled Circuit Output Transformer solved problems that had long plagued Vacuum Tube

Amplifiers. By employing a complex hand-wired transformer design, the Unity Coupled Circuit Output Transformer turned what had been a problem of capacitance between two wires into a configuration where the two wires support the transformer's performance. Furthermore, the complete coupling of both halves of the transformer prevents the collapse of the magnetic field, which is an issue for other Vacuum Tube Amplifier designs. The Unity Coupled Circuit also eliminated the switching error between positive and negative halves, freeing the Tube Amplifier of a sloppiness heard in other unsuccessful configurations.

On the Solid State side, the MC901 utilizes our Autoformer, which provides the optimal method of connecting a Solid State Amplifier to a Loudspeaker of virtually any impedance. The McIntosh Autoformer provides full power to the Loudspeaker regardless if it has 2, 4 or 8 Ohm impedance while offering DC current protection to the valuable Loudspeakers. The Quad Balanced design of the MC901 works with the Autoformer to combine two out of phase audio signals. The two out of phase signals are magnetically combined in the Autoformer where one signal is inverted back into phase with the other signal. During this process, any distortion in either signal will be out of phase with the other signal and cancelled. While distortion is cancelled, the power will be summed due to the unique properties of the hand-wiring of the McIntosh Autoformer, and the newly combined signal will be twice the power of the individual signals.

Power Guard® monitors and adjusts the input signal in the 600 Watt solid state amplifier section in real time, then makes unobtrusive adjustments to prevent harsh sounding distortion and potential speaker damaging clipping. The 300 Watt Vacuum Tube amplifier section of the MC901 breaks new ground as it's our first amplifier to feature our new Power Guard Screen Grid

Sensor™ (SGS) technology. Power Guard SGS™ helps prevent premature Vacuum Tube failure by monitoring the screen grid current in the KT88 output Vacuum Tubes. If the current becomes too high, a circuit in Power Guard SGS is activated which then dynamically attenuates the input signal in real time to keep the Vacuum Tubes operating at safe levels.

The Solid State and Tube Amplifier sections of the MC901 are engineered to function in tandem, with each specifically designed to perform its role. Fine tuning your system is made simple with variable Low Pass and High Pass Filters. This allows you to compliment the crossover settings of your Loudspeakers and maximize the power available to each frequency range. Relative gain levels for each section can be adjusted from -6dB to + 3dB, or you can connect a direct feed to each Amplifier section and bypass all the filters. This is perfect if you have room correction and crossovers external to the MC901.

McIntosh is uniquely positioned to create the MC901. McIntosh has a 70-year track record of producing award-winning Solid State and Vacuum Tube Amplifiers utilizing our patented technologies. The MC901 builds upon this foundation and expands this legacy of quality and cutting-edge innovations. That is why only McIntosh could have developed the one-of-a-kind MC901.

What is in the box

Here is what is in the box besides all the shipping foam:

- One MC901 Dual Mono Amplifier
 - One manual package including this manual
 - Two Terminal Connection Covers
 - One AC Power Cord
 - One McIntosh Output Terminal Wrench
-

Where to put it

First, you must acknowledge that the MC901 is VERY HEAVY. When moving the unit, have enough help to lift the MC901. This will ensure the safety of both you and the MC901.

The MC901 should be installed upright on the floor or amplifier stand. Adequate ventilation is important and will aid in a long trouble-free life of the MC901. Enclosures are not recommended, but if you wish to enclose the MC901, you must ensure proper airflow and allow at least 19 inches (48.3cm) above the unit and 6 inches (15.2cm) for the front, rear and sides. Do not remove the feet and make sure there is nothing obstructing the airflow beneath the MC901. There must be openings for the warm air to escape above the unit and a fan would aid in this regard.

Removal of Foam Inserts over Vacuum Tubes

IMPORTANT!

REMOVE THE FOAM INSERTS OVER THE VACUUM TUBES PRIOR TO CONNECTING THE A.C. POWER SUPPLY CORD.

- To prevent damage to the Tubes during shipping, there are special foam inserts surrounding the Tubes of the Power Amplifier
- **The Foam Inserts must be removed** from the MC901 before connecting the AC Power Supply Cord to the Power Amplifier
- **Failure to do so has the potential of a Fire Hazard, resulting in damage to the MC901 and the surrounding environment**
- **Follow these instructions for removal of the packing foam** before connecting the AC Power Supply Cord to the MC901

To remove the protective foam, it is necessary to temporarily remove the two Tube Covers. To remove each Tube Cover:

- Use a Phillips Head #2 screw driver to remove the two screws that hold each of the Tube Covers (Figure 01)
- Pull the Tube Cover slightly outward from the center of the MC901 to clear the lip covering the top edge of the Tube Cover, and then lift upward (Figure 02)
- Pull the protective foam straight up off the Vacuum Tubes (Figure 02)
- Replace the Tube Cover
- Replace the two screws to secure the cover (Figure 01)
- Do this procedure for each of the two Tube Covers

Save the protective foam and warning label for possible future use.

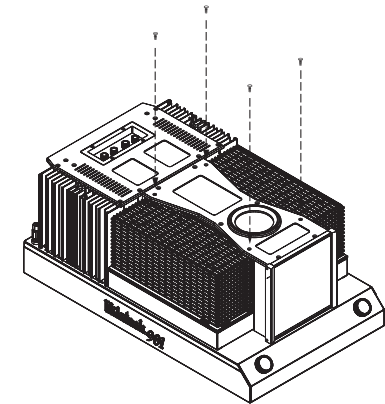


Figure 01— Removing Tube Cover Screws

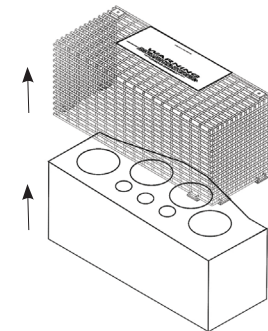


Figure 02— Remove Protective Foam

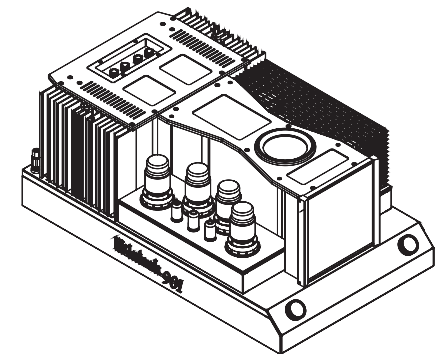


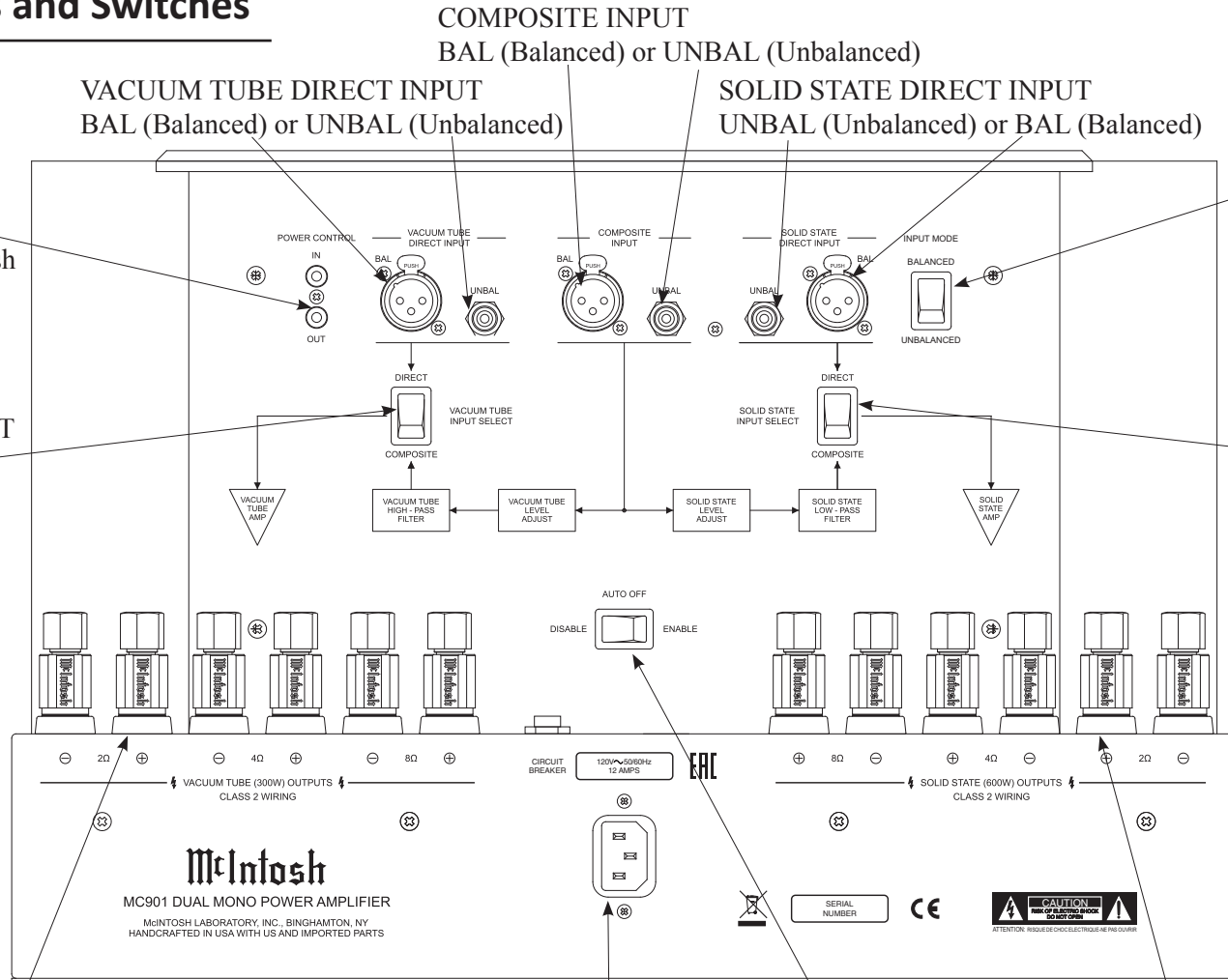
Figure 03— Tubes Revealed



Rear Connections and Switches

POWER CONTROL
IN and OUT for On/Off
signals to (OUT) and
from (IN) other McIntosh
Components

VACUUM TUBE INPUT
SELECT Switch
Used to select DIRECT
or COMPOSITE input
for the Vacuum Tube
Amplifier



INPUT MODE Switch
Used to select
BALANCED or
UNBALANCED inputs

SOLID STATE INPUT
SELECT Switch
Used to select DIRECT
or COMPOSITE input for
the Solid State Amplifier

VACUUM TUBE (300W) OUTPUTS
Terminals for connecting Speaker Wire
from a Loudspeaker to the Vacuum Tube
Amplifier. Positive (+) and Negative (-)
terminals for 2, 4 and 8 Ohm
connections

AC POWER
Use supplied AC Power Cord
to connect to a live AC outlet
after other connections have
been made

AUTO OFF
When ENABLE is selected,
the MC901 will power off
after 30 continuous minutes
of receiving no signal.
DISABLE will defeat this
feature

SOLID STATE (600W) OUTPUTS
Terminals for connecting Speaker
Wire from a Loudspeaker to the
Solid State Amplifier. Positive (+)
and Negative (-) terminals for 2, 4
and 8 Ohm connections

Figure 04- Rear View

Connections on the Back

Your McIntosh Dealer is an expert in setting up systems. Proper setup is important to get the most out of your equipment. Consider using their services when installing your MC901.

AC Power

This is the last of the connections to make. All other connections should be made before connecting to AC Power.

When all other connections are securely made, use the supplied AC Power Cord to connect to a live AC Outlet.

Input Mode

The MC901 will accept Balanced and Unbalanced connections, but only one type of connection will be recognized at a time. To select the Balanced or Unbalanced connection, use the INPUT MODE Switch to toggle between these two options.

If possible, use Balanced connections. The MC901 is a Quad Balanced Amplifier, so it can take full advantage of the three conductors used in a Balanced cable. An Unbalanced cable, which uses two conductors, is more susceptible to noise.

If you need to switch the INPUT MODE, it is best to do so when the MC901 is powered off to avoid any unpleasant pop caused by switching the cable source.

Input Select Switch

For both the Solid State and Vacuum Tube sections of the MC901, it is possible to use the COMPOSITE INPUT or a DIRECT INPUT. With the selection of DIRECT INPUT, the signal bypasses the level adjust and filter for that input.

The VACUUM TUBE INPUT SELECT is located below the VACUUM TUBE DIRECT INPUT. Select either DIRECT or COMPOSITE. With the COMPOSITE INPUT selection, the signal will flow through the Level Adjust and High Pass Filter. (See “Setting the Filters” on page 12.) DIRECT INPUT will not be affected by the settings for the Level Adjust and High Pass Filter.

The SOLID STATE INPUT SELECT is located below the SOLID STATE DIRECT INPUT. Select either DIRECT or COMPOSITE. With the COMPOSITE INPUT selection, signal will flow through the Level Adjust and the Low Pass Filter. (See “Setting the Filters” on page 12.) DIRECT INPUT will not be affected by the settings for the Level Adjust and the Low Pass Filter.

Selecting COMPOSITE, the signal from the COMPOSITE INPUT is used. Selecting DIRECT will use the signal from the corresponding DIRECT INPUT.

Balanced and Unbalanced Inputs

There are three Input sections:

- VACUUM TUBE DIRECT INPUT
- COMPOSITE INPUT
- SOLID STATE DIRECT INPUT

Each Input section can accept a male Balanced XLR

cable or an Unbalanced cable with a male RCA Phono plug. Balanced XLR is the recommended method for sending input to the MC901, especially with longer runs. All inputs must use the same type of connection (Balanced or Unbalanced).

The Pin configuration of the XLR jacks are:

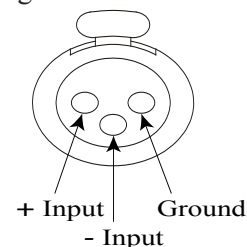


Figure 05– XLR Pin Configuration

Typically, an input of the MC901 will be connected to an Output of a Preamplifier.

Composite or Direct Inputs

Composite Input is the common choice for most applications of the MC901. The signal from a single Preamplifier will be sent to both the Solid State and Vacuum Tube Amplifiers with the frequency range tailored by the filters to match the attached Loudspeaker.

The Direct Inputs can be useful for situations with external crossover settings feeding the MC901. Direct Inputs can be used for feeding full-range signals to two separate Loudspeakers from a single MC901. Some people have different setups for different genres of music. For instance, Classical Music might be played through a dedicated Tube setup, while Rock Music may be through a Solid State system.

In the case of wanting the MC901 to power two separate Loudspeakers, the DIRECT INPUTs should



be used. The SOLID STATE DIRECT INPUT and the VACUUM TUBE DIRECT INPUT will feed their respective Outputs. The SOLID STATE OUTPUT can be connected to one Loudspeaker and the VACUUM TUBE OUTPUT can be connected to another. Each Amplifier section of the MC901 will be generating full frequency signals. A Preamplifier's Output Selector can be used to toggle between Solid State and Vacuum Tube output. For Stereo, a second MC901 is required in all cases.

Power Control

Power Control allows the MC901 to send (OUT) and receive (IN) On/Off signals to/from other McIntosh equipment. In this way, powering on or powering off a single component can do the same for multiple units.

The Power Control Input Jack accepts an On/Off signal from +5 to +12 volts. Meter Lights can be controlled as well. The Power Control Output will provide a +12 volt signal with a total current up to 25 mA. Connections are made using an 1/8 inch stereo mini phone plug with the following wiring:

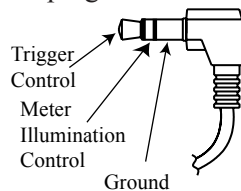


Figure 06– Power Control (trigger) mini plug

Auto Off Switch

When the AUTO OFF Switch is in the ENABLE position, the MC901 will automatically power off when there has been 30 continuous minutes of not receiving any input signal.

When the AUTO OFF Switch is in the DISABLE position, the MC901 will remain on unless manually powered off.

Connecting a Speaker

A Question of Impedance

The MC901 is designed for two separate connections to a single Loudspeaker. The Solid State Amplifier Output Terminals should be connected to the Low Frequency Terminals of your Loudspeaker. The Vacuum Tube Amplifier will be connected to the High/Mid Terminals of your Loudspeaker.

Based on the specifications of your Loudspeaker, determine the best impedance to use for each connection. Each Amplifier has a pair of 2 Ohm, 4 Ohm and 8 Ohm Output terminals. Keep in mind that the impedance rating of your Loudspeaker is an average over a range of frequencies. It would be helpful if you have a curve that shows your Loudspeaker's impedances over the frequency range. A Loudspeaker rated 8 Ohm may be closer to 4 Ohm on the low end. It is a safe bet to use the lower impedance Output Terminals for a speaker whose impedance falls between two choices. For example, using the 4 Ohm Output Terminals for a 6 Ohm Loudspeaker will give a slightly cleaner signal. It is very possible that some Loudspeakers will work best with 4 Ohm Output Terminals for the High/Mids and 8 Ohm Output Terminals for the Woofers.

The Speaker Wire

If speaker wire is not already terminated, remove ½ inch (12.7mm) of insulation from the wire end and twist the strands together. For runs under 25 feet (7.6m), use at least 16AWG wire. For runs under 50 feet (15.2m) use at least 14AWG, and for longer runs up to 100 feet (10.5m), use 12AWG. 12AWG, being the larger wire, can be used in all the above cases if desired. The above guidelines are for 8 Ohm connections. When using 4 Ohm speaker connections, subtract 2 from the gauge. For 2 Ohms subtract 4. For example, a minimum gauge for a 50 foot 2 ohm run would be 10AWG. See Figure 07.

Generally, thicker gauge wire is better than thinner until it doesn't fit in the Output Terminal hole.

Loudspeaker Wire Gauge Guide			
Impedance	25 feet (7.62 meters) or less	50 feet (15.24 meters) or less	100 feet (30.48 meters) or less
2 Ohms	12AWG	10AWG	8AWG
4 Ohms	14AWG	12AWG	10AWG
8 Ohms	16AWG	14AWG	12AWG

Figure 07– Loudspeaker Wire Gauge Guide

The Output Terminal Hookup

When connecting the speaker wire to the MC901 Output Terminals, please follow these steps:

- Make sure AC Power is disconnected
- Determine which pair of Output Terminals to use (2 Ohm, 4 Ohm or 8 Ohm). Pay close attention to the Polarity (+/-). **Proper Polarity must be maintained for all connections**

- Rotate the end of the Output Terminal Post counterclockwise until an opening appears (Figure 08)
- Remove the two Cover Screws from the rear of the MC901. These will be used to secure the Terminal Connection Cover (Figure 10 on page 9). The Terminal Connection Covers ship unsecured and the screws are in place
- Insert the Loudspeaker Hookup Cable through the Cover Opening of the Output Terminal Cover (Figure 11). Choose the opening that will be closest to the Output Terminal Posts you will be connecting
- Insert the Loudspeaker hookup cable into the Output Terminal Post opening or the cable spade lug around the center post of the Output Terminal (Figure 08)
- Rotate the end of the Output Terminal Post

clockwise until it is finger tight

- Place the supplied McIntosh wrench over the end of the Output Terminal and rotate it one quarter of a turn (90°) to secure the Loudspeaker cable connection (Figure 09).

Do not over tighten

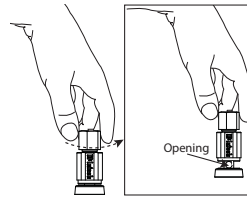


Figure 08– Opening Output Terminal

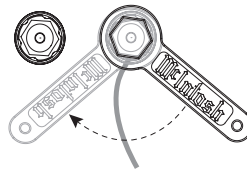


Figure 09– Tightening Output Terminal

- Slide the Terminal Connection Cover over the Output Terminals. Fasten with the two screws removed earlier

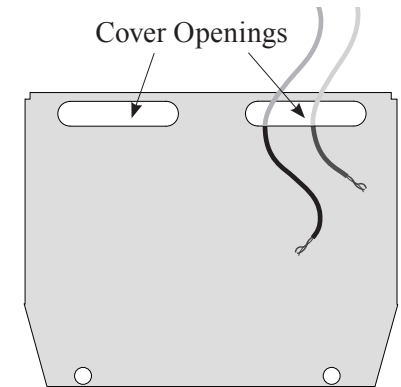


Figure 11– Terminal Connection Cover openings

WARNING: Loudspeaker terminals are hazardous live and present a risk of electric shock. Make sure the Terminal Connection Cover is installed. For additional instructions on making Loudspeaker connections contact your McIntosh Dealer or McIntosh Technical Support.

Remove Loudspeaker Jumpers

IMPORTANT: Never combine the Solid State and Vacuum Outputs of the MC901.

If the Loudspeaker's Terminals connected to the Solid State Outputs of the MC901 are connected via jumper cables to the Loudspeaker Terminals connected to the MC901's Vacuum Outputs, **REMOVE THE JUMPER CABLES.**

If the Vacuum Tube Output is powering both Midrange and High terminals of the Loudspeaker, and the Solid State Output is powering the Low terminals, jumper cables can be used to connect the High and Midrange Terminals.

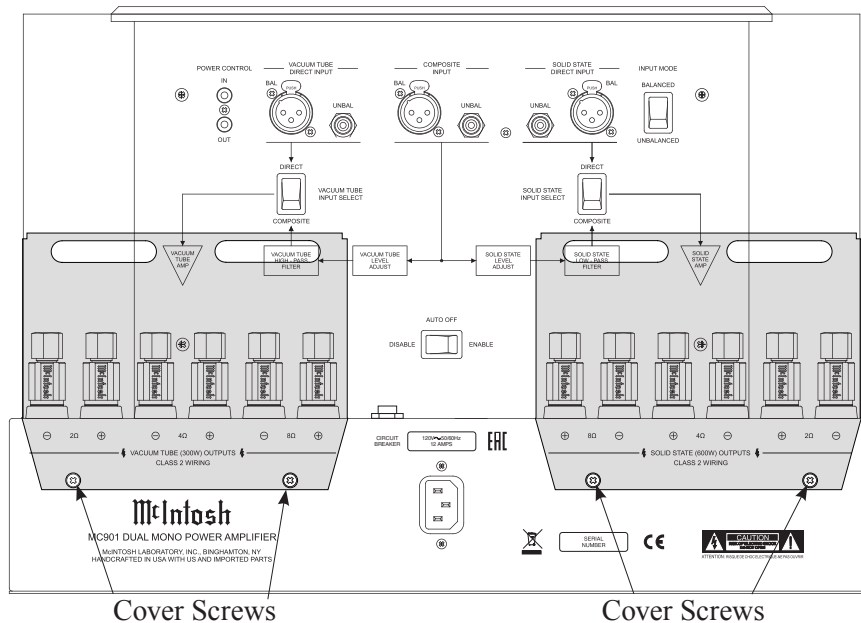


Figure 10– Terminal Connection Covers



Sentry Monitor

Sentry Monitor provides protection for the MC901 by monitoring Output. In the event of a large impedance mismatch, a short circuit at the Output Terminals or Loudspeaker Terminals, or Tube failure, Sentry Monitor will activate to prevent potentially destructive levels of current from flowing.

When Sentry Monitor is activated, the MC901 will power off, and the three smaller tubes on the side of the problem will flash red. Since the Vacuum Tube Amplifier actually consists of two Amplifiers out of phase with each other, an issue can occur on either side as indicated by the flashing red lights.

To reset the Sentry Monitor Protection Circuitry, turn the Power Control Knob to OFF. (See “Power Control Knob” on page 14.) Wait one minute and then turn the Power Control Knob to ON.

If Sentry Monitor continues to engage, the problem must be fixed before continuing. Check that wires connected to the Output Terminals and the Loudspeaker Terminals are not shorted. If those connections are fine, and the Impedance of the Loudspeakers is close to the value of the connected Output terminals, the issue may be a defective tube. Vacuum Tubes on the side indicated by the flashing red lights should be tested. Contact an Authorized McIntosh Dealer or Authorized McIntosh Service Agency for service.

Sentry Monitor has absolutely no effect on the performance of the MC901 while it is monitoring the MC901.

Quad Balanced

McIntosh’s Quad Balanced design solves the age-old Amplifier trade off that more power equals more noise. Properly designed high-power solid state Amplifiers use many transistors connected in parallel to share the power load. The transistors share the load to avoid becoming stressed. The downside is that each transistor added raises the noise floor a small amount. Quad Balancing eliminates this problem.

In the MC901, the 600 watt Solid State Amplifier contains two identical signal paths or modules. The audio signal is fed into one module, but the other module receives the same music signal, inverted, so the electrical waves are traveling in the opposite direction (up where it was going down, down where the wave had been going up). During amplification, some small amount of noise is produced by each amplification module. Module #1, therefore, produces amplified music plus a bit of noise, while Module #2 produces amplified inverted music, plus a small amount of noise. The two signals enter McIntosh’s patented Output Autoformer, with dual windings going opposite directions, which invert the previously inverted signal, putting it back to its original form. The power from Module #1 (regular music) is combined with the power from Module #2 (inverted once before amplification and once again inside the transformer, so it’s now back to its original form), but with twice the power. The noise, on the other hand, gets cancelled when the noise from Module #1 is added to the noise from Module #2, since those noise waves are going opposite directions. The Output Autoformer doubles the power and cancels noise at the same time.

The Vacuum Tube side of the MC901 also takes full advantage of Quad Balanced architecture. With the

Vacuum Tube implementation of Quad Balanced design, all the benefits of Vacuum Tubes are preserved while unwanted noise is eliminated.

Circuit Breaker

The MC901 is protected by a Circuit Breaker. The Circuit Breaker can be reset by pressing down (see Figure 12). If the Circuit Breaker continually trips, resolve the underlying issue before continuing to use the MC901.

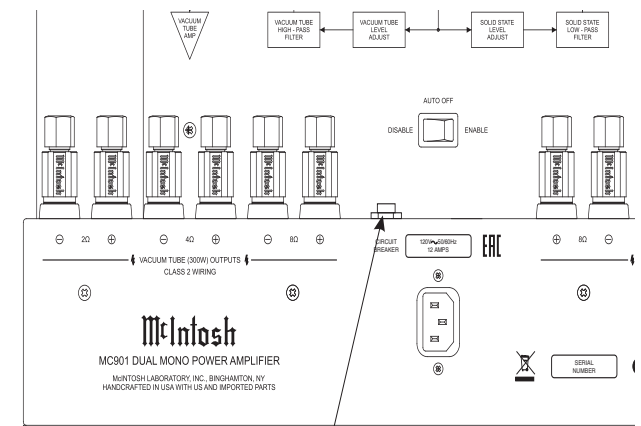


Figure 12– Circuit Breaker

MC901 Connection Diagram

#	Connection
1	Balanced cable Preamplifier to Composite Input
2	Balanced cable to 2nd MC901
3	Power Control from Preamplifier OUT to IN
4	Power Control OUT to 2nd MC901 IN
5	Solid State to Low Speaker Terminals
6	Vacuum Tube to High/Mid Terminals
7	To AC Power

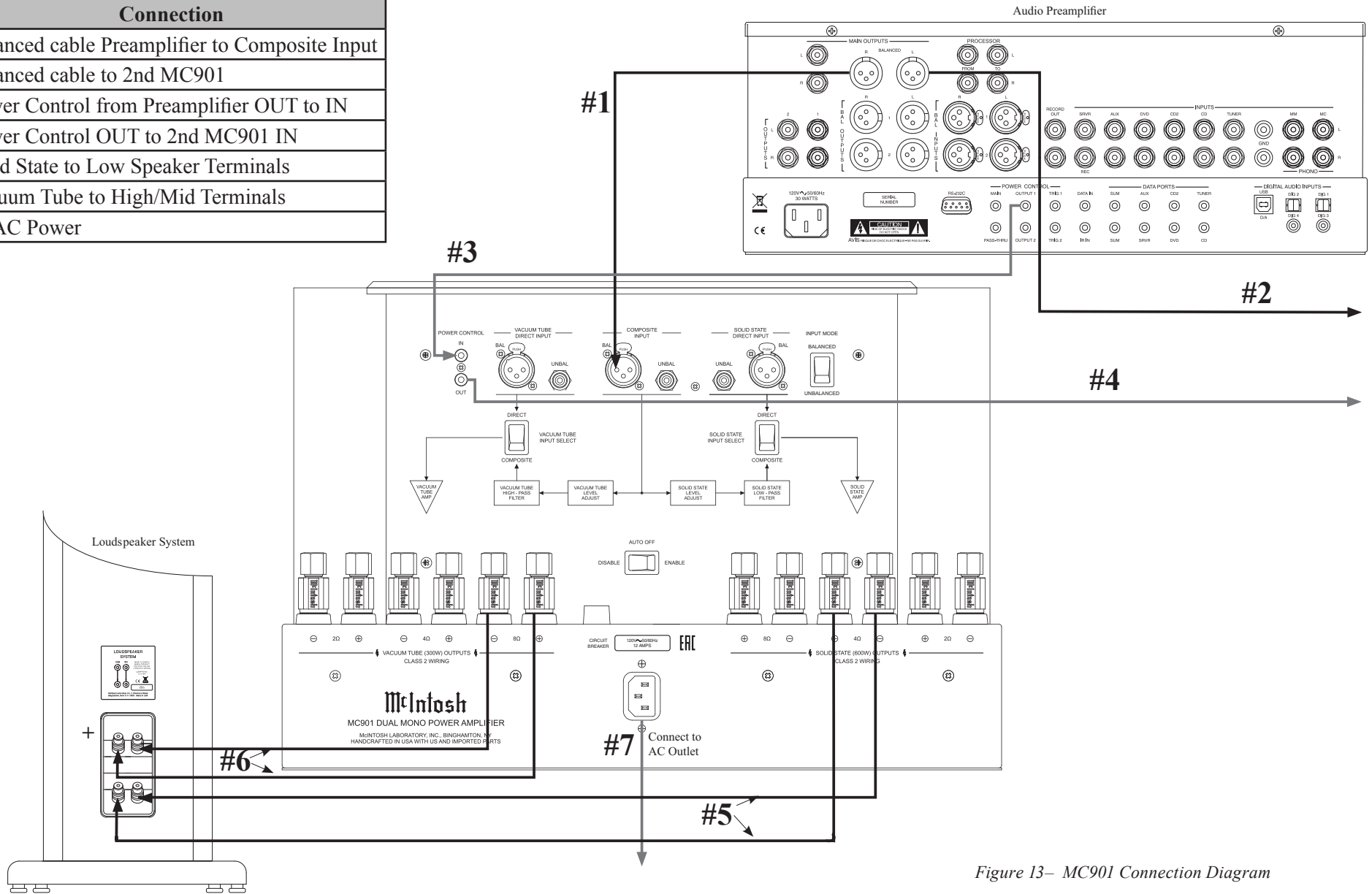


Figure 13– MC901 Connection Diagram

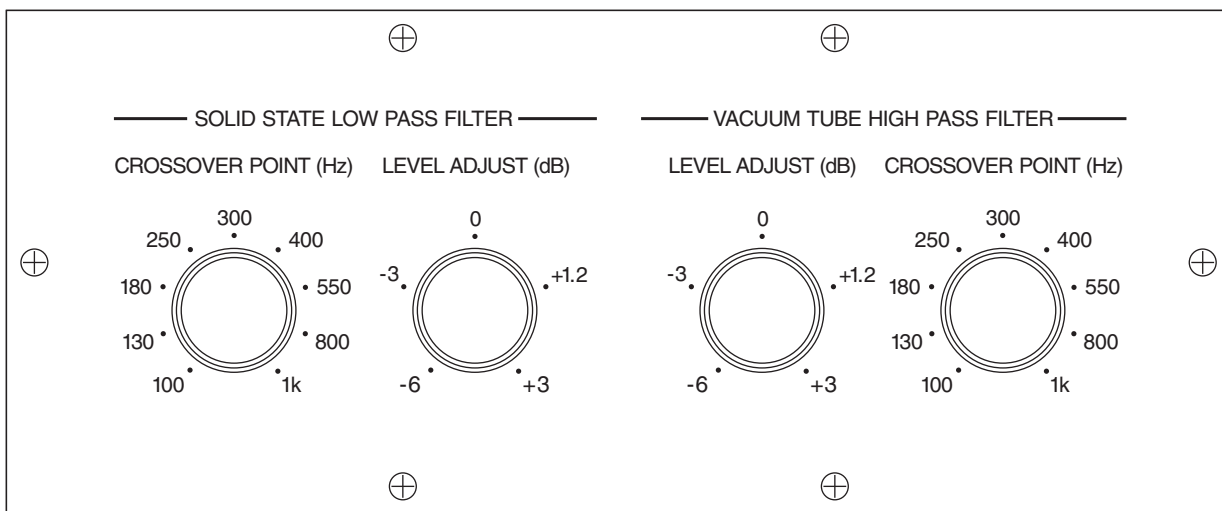


Figure 14- EQ Knobs

Setting the Filters

The MC901's filters tailor the output frequency range to the attached Loudspeaker. The setting of each filter should match the corresponding crossover frequency of the Loudspeaker. The MC901 has built-in roll-off for each filter. (See "Roll-off for Crossover Points" on page 16.) Choose the Loudspeaker's actual CROSSOVER POINT for each filter and the MC901 will taper the output level outside of the frequency range to the point of zero output.

Low Pass Filter

The SOLID STATE section of the MC901 has a LOW PASS FILTER Knob. This knob should be set for the crossover point between the low end (Woofers) and Midrange of your Loudspeaker. Check your Loudspeaker's specifications. The LOW PASS FILTER Knob is adjustable from 100Hz to 1kHz. The knob is continuous so all

settings between 100Hz and 1kHz are available. Use the actual crossover specification. Roll-off will be handled by the MC901. Frequencies above the roll-off point will not be amplified by the SOLID STATE Amplifier.

High Pass Filter

The VACUUM TUBE section of the MC901 has a HIGH PASS FILTER Knob. This knob should be set for the crossover point between the low end (Woofers) and Midrange of your Loudspeaker just like the LOW PASS Knob. The HIGH PASS FILTER Knob is also adjustable from 100Hz to 1kHz. The knob is continuous so all settings between 100Hz and 1kHz are available. The HIGH PASS FILTER will not amplify frequencies below the roll-off point of the HIGH PASS FILTER.

It is possible to set each filter to a different value. This is not recommended because it can cause peaks or notches in the sound in the range where the frequencies are being duplicated by both the SOLID STATE and VACUUM TUBE Amplifiers or there is a

gap in frequencies being sent to the Loudspeaker.

Setting the Level Adjust

The two LEVEL ADJUST Knobs allow Gain adjustments to be made to the SOLID STATE and VACUUM TUBE Amplifiers. The goal is to achieve a proper balance between the Low End (Woofers) of the Loudspeaker and the High/Midrange.

Each Amplifier has a LEVEL ADJUST Knob. The Knobs allow for Gain adjustments from -6dB to +3dB. The center 0dB position of each Knob is notched, but the adjustments are continuous between -6dB and +3dB. The notch marks the position of zero Gain adjustment.

When making Gain adjustments, it is preferable to subtract decibels (dB) rather than raise them. For example, if you want a 3dB boost for the High/Midrange, you can lower the SOLID STATE Amplifier to -3dB or turn the VACUUM TUBE Amplifier to +3dB. Each will achieve the same relative change but reducing Gain will never add any distortion. This may be an academic point in that you will most likely not hear any difference once the over volume is adjusted. Still this is a good approach to gain adjustments.

Vacuum Tubes Used in the MC901

The MC901 uses 14 Vacuum Tubes as follows:

- Eight KT88 Part Number 165073
- Four 12AT7 Part Number 165078
- Two 12AX7A Part Number 165080

Because of the high current involved with these Tubes, they should only be replaced by an Authorized McIntosh Dealer or Authorized McIntosh Service

Agency.

The MC901 will function optimally with any correct tube type that is functioning within the design specifications of the MC901. Only when a Tube falls outside of the acceptable range will any diminishing of performance be heard. Because McIntosh Tube Amplifiers are engineered to use Tubes in a way that does not rely on the Tube's individual character and can perform perfectly provided the specifications are met, there is no advantage to seeking out expensive esoteric tubes.

Over time, a Tube may fall out of the proper specification range. New Tubes that meet the MC901's specifications can be ordered using the Part Numbers on page 12. For the positions of the tubes, see Figure 15. This pattern is found on each side of the MC901.

The Front of the MC901

The Dual Meter

The MC901 has a custom Dual Meter which displays the power output for both the Vacuum Tube and Solid State Amplifiers. The Vacuum Tube scale is displayed on the top and the longer needle will point to the current output. The Solid State scale is on the bottom and indicated by the shorter needle. The Dual Meter provides an accurate measurement of power to safely know what wattages are sent to the attached speaker.

The Dual Meter uses a logarithmic scale represented as decades on the meter scales. This means that the scale is increasing 10-fold at each marker. In this way, small changes can be visible when listening at lower volumes. Output peaks are held momentarily and then decay so that the values are easier to track.

Without this feature the pointer might appear like an endlessly moving blur.

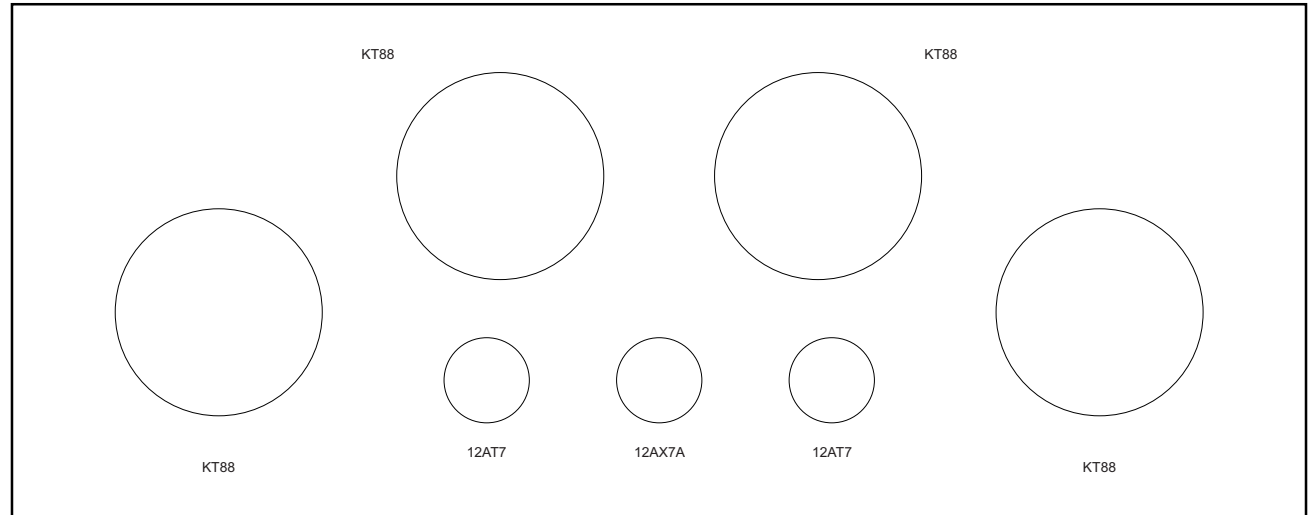


Figure 15– Vacuum Tube Positions

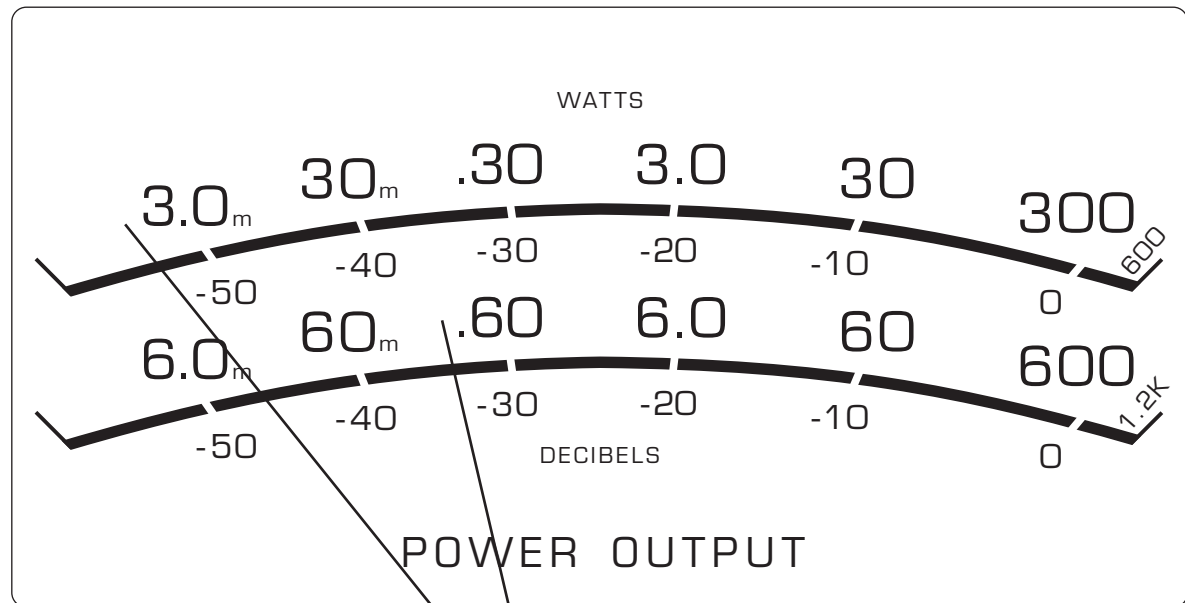


Figure 16– Dual Meter

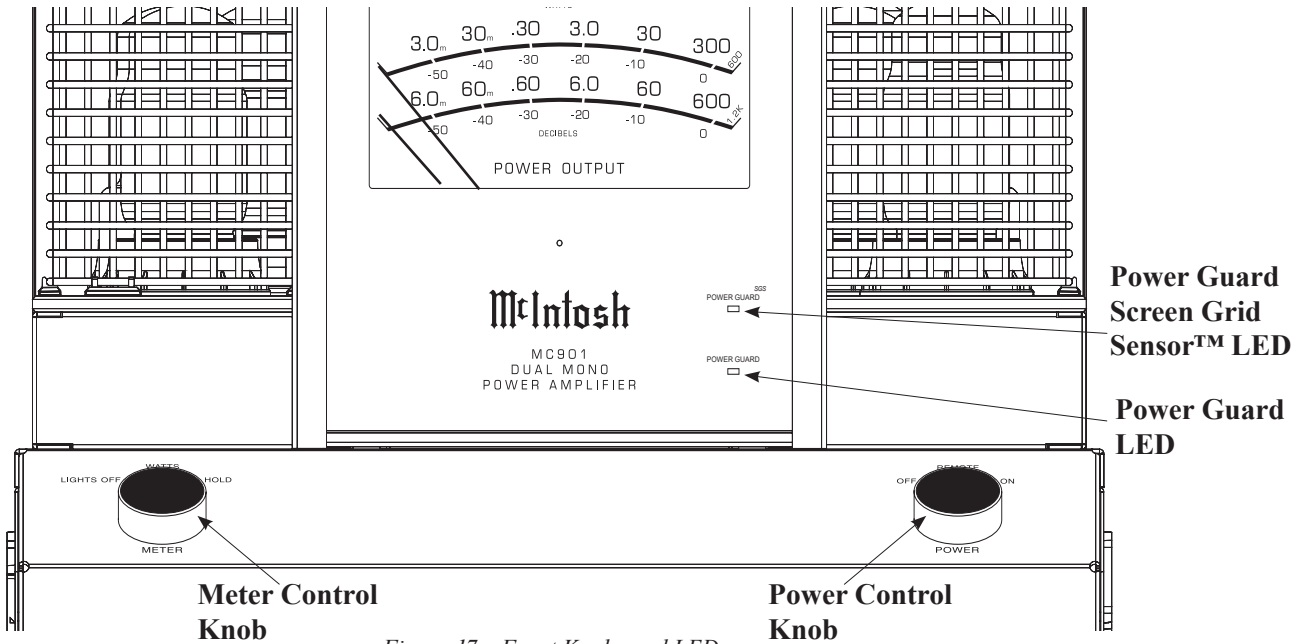


Figure 17- Front Knobs and LEDs

Meter Control Knob

The Meter Control Knob has three switch positions:

- **LIGHTS OFF**- the Meter lights will be off. The Dual Meter will still respond to output
- **WATTS**- the Meter responds to all output and the Meter Light is on unless controlled by another unit as noted below
- **HOLD**- the Dual Meter needle will lock on the highest peak in a series of peaks. When a higher peak is reached, the needle will hold that value. If no greater power level is reached, the needle will lower its level at a rate of approximately 6dB per minute returning to a lower power peak or resting position

Note that when in the WATTS or HOLD position, the Meter Light will be powered On or Off by a Preamplifier (or A/V Control Center) connected by a Power Control Cable if that unit has Power Control capabilities.

Power Control Knob

The Power Control Knob has three switch positions:

- **OFF**- the MC901 will Power Off no matter what signal may be received from a unit connected by a Power Control cable
- **REMOTE**- the MC901 can be powered On and Off by a Preamplifier or A/V Control

Center connected by a Power Control Cable. See “Power Control” on page 8

- **ON**- this position will Power the MC901 On

Power Guard LED

Power Guard® continuously monitors input and output signals and can dynamically adjust input levels to insure maximum output while avoiding harsh clipping or distortion. Patented Power Guard® technology allows its circuitry to remain completely outside the signal path unless needed. When Power Guard is engaged, the effect is very subtle especially when compared with clipping and distortion of other overdriven Amplifiers.

The lower red LED indicates by flashing when Power Guard® is engaged for the Solid State side.

Power Guard Screen Grid Sensor (SGS) LED

Power Guard Screen Grid Sensor™ (SGS) helps prevent premature Vacuum Tube failure by monitoring the screen grid current in the KT88 output Vacuum Tubes. If the current becomes too high, a circuit in Power Guard SGS™ is activated which then dynamically attenuates the input signal in real time to keep the Vacuum Tubes operating at safe levels.

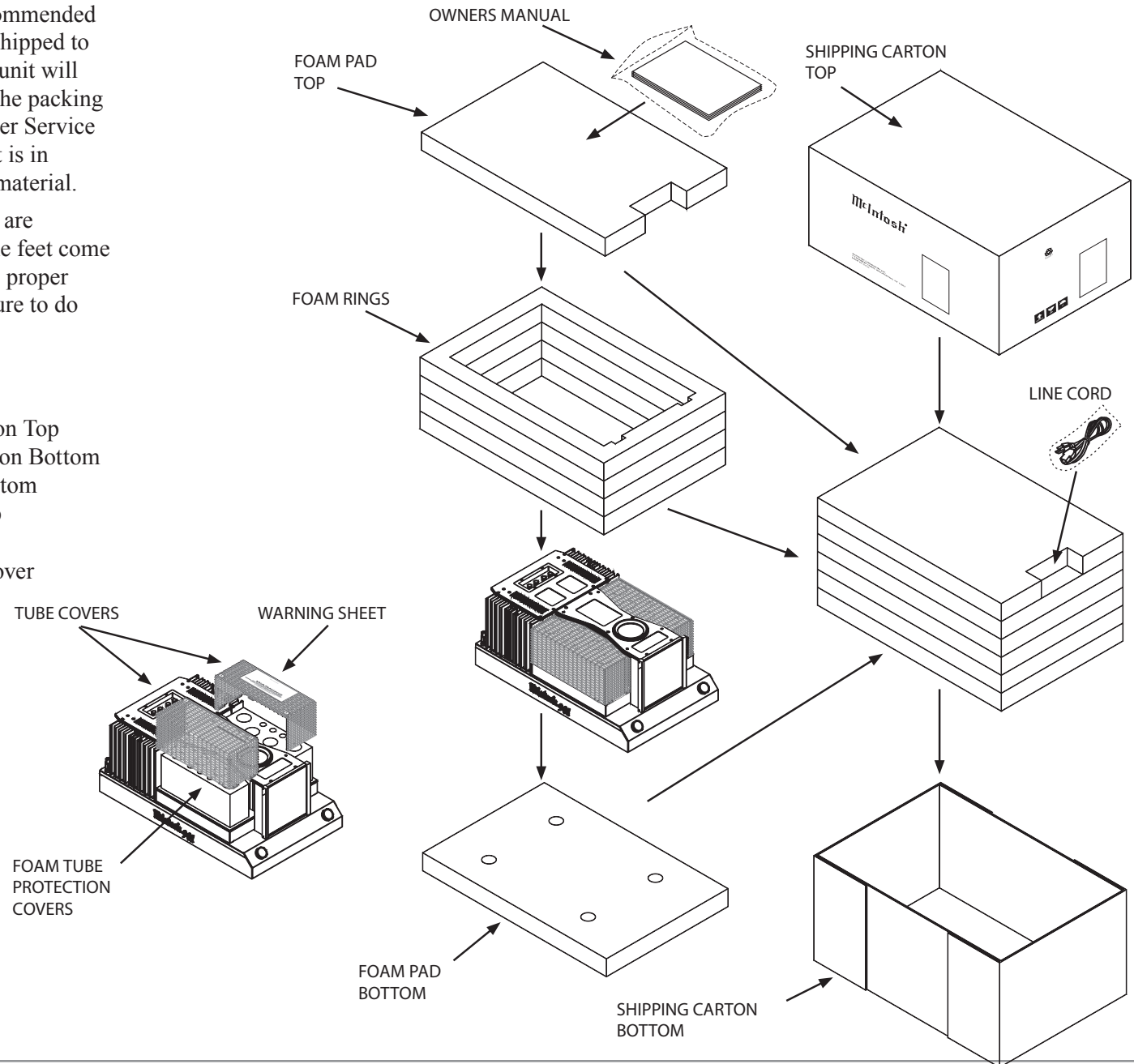
The upper red LED will flash when Power Guard SGS is engaged in protecting the Vacuum Tubes.

Repacking the MC901

When shipping the MC901, it is highly recommended that the unit be packed as it was originally shipped to avoid damage. Failure to properly pack the unit will likely result in damage. If you need any of the packing material, you can contact McIntosh Customer Service (see page 3). Use only packing material that is in good condition and replace non-servicable material.

It is very important that the four plastic feet are attached to the bottom of the equipment. The feet come installed on the MC901. The feet ensure the proper equipment location on the bottom pad. Failure to do this will result in shipping damage.

Quantity	Part Number	Description
1	034632	Shipping carton Top
1	034633	Shipping Carton Bottom
1	034634	Foam Pad Bottom
1	034635	Foam Pad Top
4	034636	Foam Ring
2	034639	Foam Tube Cover





Roll-off for Crossover Points

The following two graphs represent the roll-off characteristics for various filter crossover settings. The output will taper starting with the selected CROSSOVER POINT.

The lines from left to right represent the Crossover Points as noted on the SOLID STATE LOW PASS FILTER Knob:

- 100 (A)
- 130 (B)
- 180 (C)
- 250 (D)
- 300 (E)
- 400 (F)
- 550 (G)
- 800 (H)
- 1000 (I)

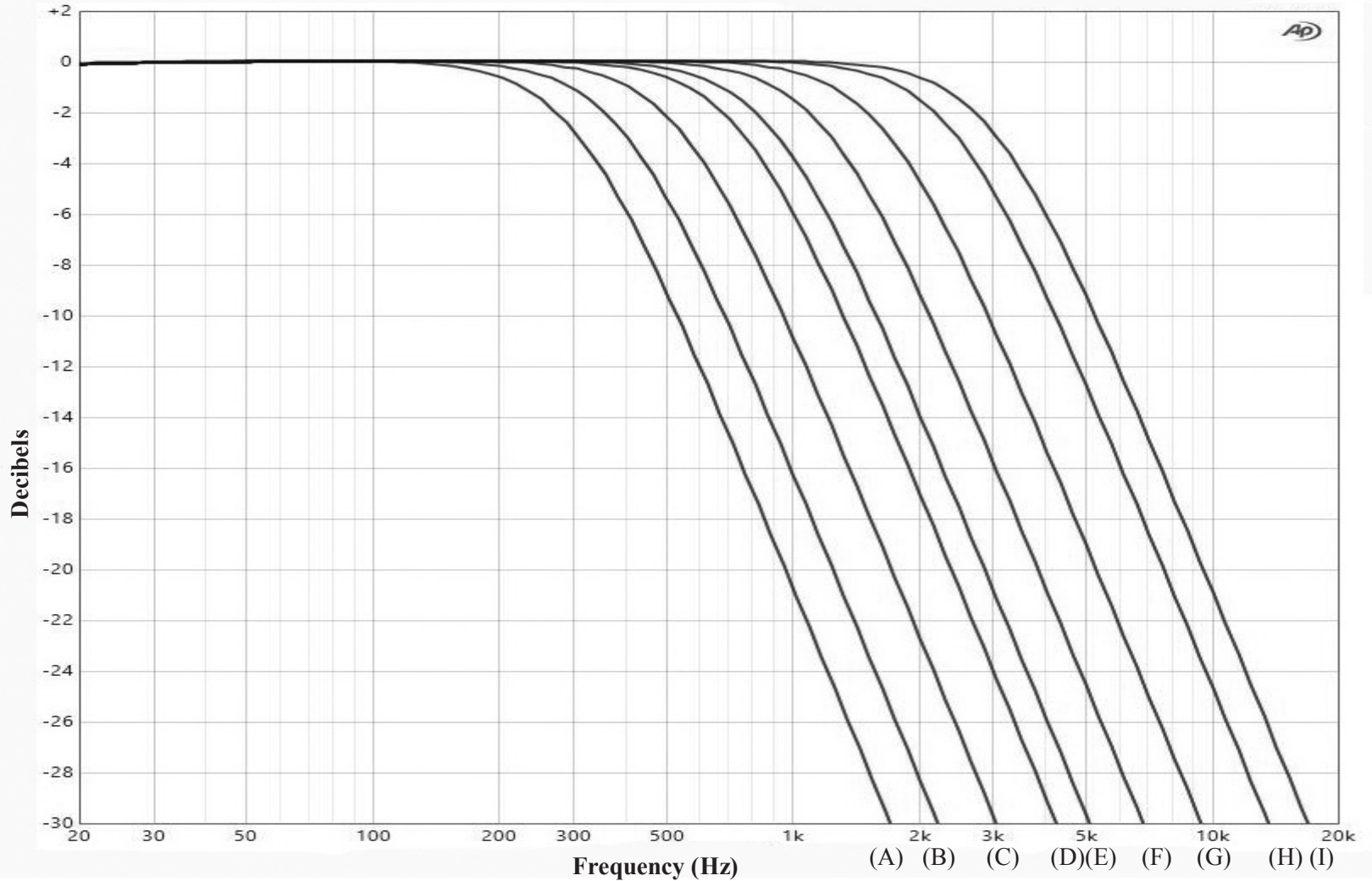


Figure 18– Roll-Off for Low Pass Filter

The lines from left to right represent the Crossover Points as noted on the VACUUM TUBE HIGH PASS FILTER Knob:

- 100 (A)
- 130 (B)
- 180 (C)
- 250 (D)
- 300 (E)
- 400 (F)
- 550 (G)
- 800 (H)
- 1000 (I)

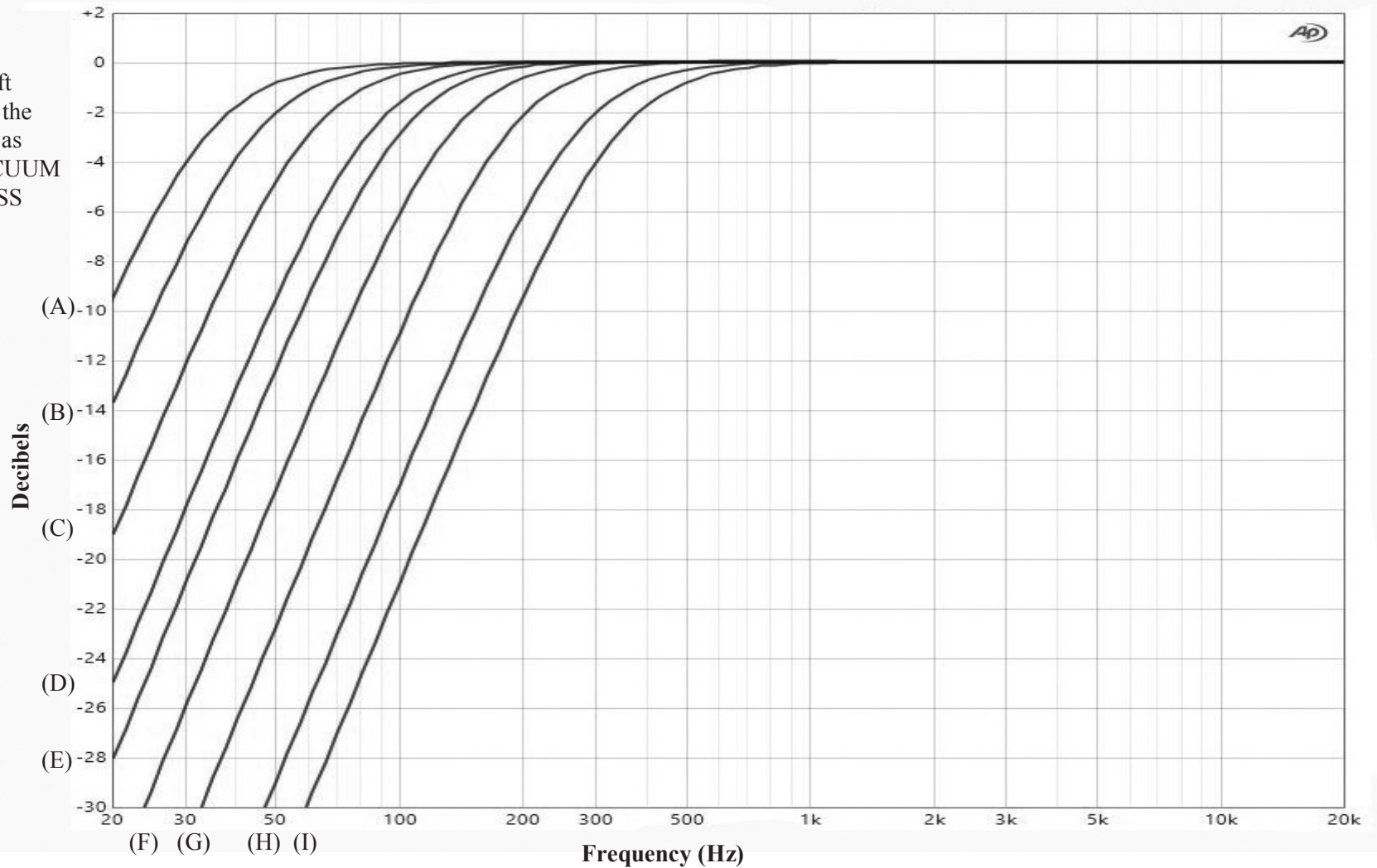


Figure 19– Roll-Off for High Pass Filter

Roll-off for 1K Crossover Point

This graph uses a 1k CROSSOVER POINT for both Filters. This demonstrates the combined taper for both the HIGH PASS and LOW PASS Filters. Other CROSSOVER POINTS will have a similar curve.

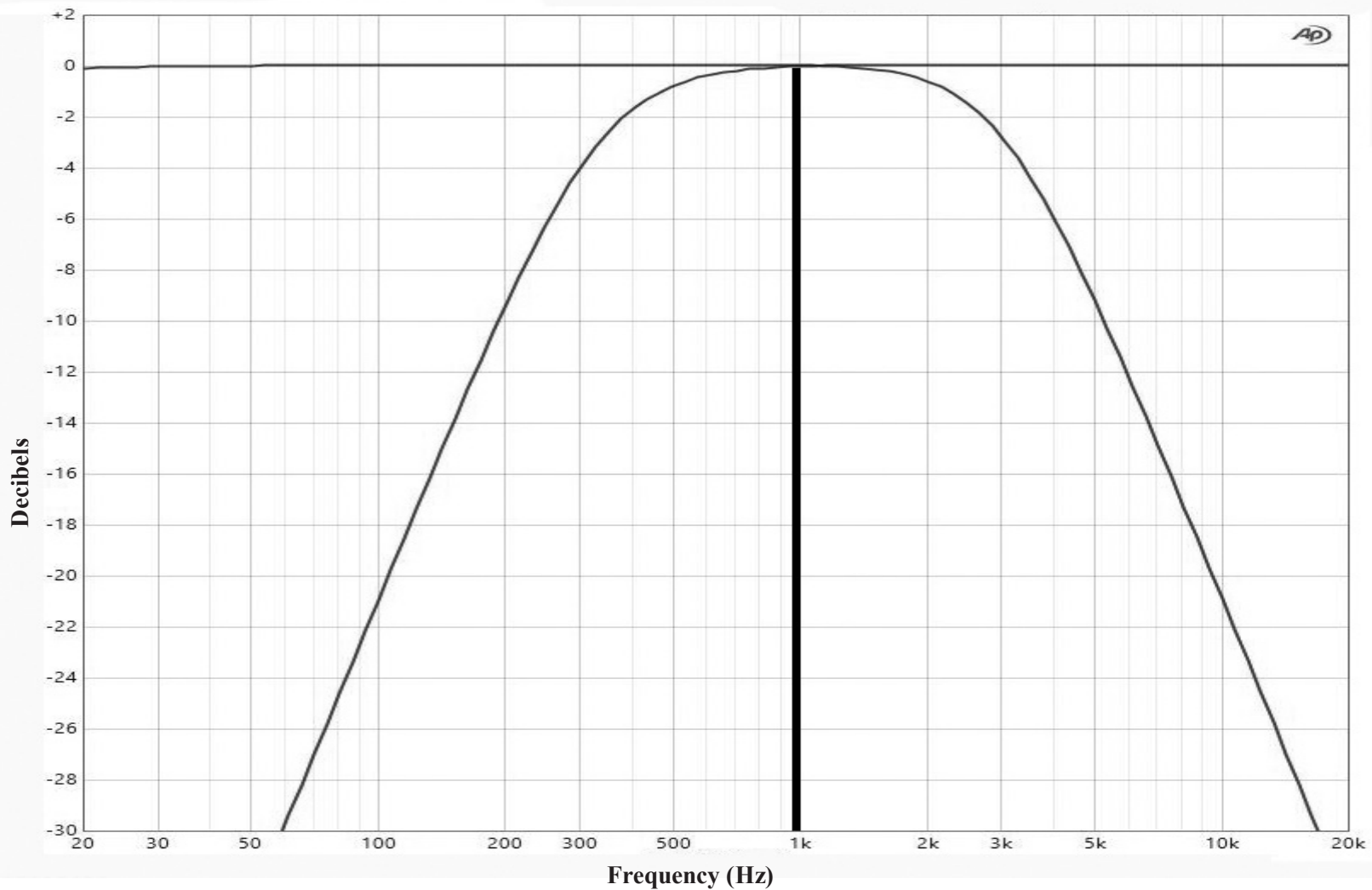


Figure 20– 1K Roll-off Combined Graph

Solid State Specifications

Power Output Solid State

600 watts into 2 Ohm load
600 watts into 4 Ohm load
600 watts into 8 Ohm load

Rated Power Band

20Hz to 20,000Hz

Dynamic Headroom

2.5dB

Wide Band Damping Factor

Greater than 40

Frequency Response (Direct)

+0, -0.25dB from 20Hz to 20,000Hz
+0, -3.0dB from 10Hz to 100,000Hz

Total Harmonic Distortion

0.005% maximum harmonic distortion at any power level from 250 milliwatts to rated power, 20Hz to 20,000Hz

Intermodulation Distortion

0.005% maximum, if the instantaneous peak power output does not exceed twice the rated power output for any combination of frequencies from 20Hz to 20,000Hz

Signal To Noise Ratio (A Weighted)

122dB below rated output

Input Sensitivity (for rated output)

4.8 Volts Balanced
2.4 Volts Unbalanced

Voltage Gain

29dB, 8 Ohms
26dB, 4 Ohms
23dB, 2 Ohms

Input Impedance

22,000 ohms Balanced
22,000 ohms Unbalanced

Vacuum Tube Specifications

Power Output Vacuum Tube

300 watts into 2 ohm load
300 watts into 4 ohm load
300 watts into 8 ohm load

Rated Power Band

20Hz to 20,000Hz

Dynamic Headroom

1.2dB

Wide Band Damping Factor

Greater than 18

Frequency Response (Direct)

+0, -0.5dB from 20Hz to 20,000Hz
+0, -3.0dB from 10Hz to 70,000Hz

Total Harmonic Distortion

0.5% maximum harmonic distortion at any power level from 250 milliwatts to rated power, 20Hz to 20,000Hz

Intermodulation Distortion

0.5% maximum, if the instantaneous peak power output does not exceed twice the rated power output for any combination of frequencies from 20Hz to 20,000Hz

Signal To Noise Ratio (A Weighted)

112dB below rated output

Input Sensitivity (for rated output)

3.4 Volts Balanced
1.7 Volts Unbalanced

Voltage Gain

29dB, 8 Ohms
26dB, 4 Ohms
23dB, 2 Ohms

Input Impedance

22,000 ohms Balanced
22,000 ohms Unbalanced

General Specifications

Power Control Input

5-15VDC, less than 1mA

Power Control Output

12VDC, 25mA (Delayed 0.2 seconds from power on)

Power Requirements

100 Volts ~ 50/60Hz at 15 Amps
110 Volts ~ 50/60Hz at 12.5 Amps
120 Volts ~ 50/60Hz at 12 Amps
127 Volts ~ 50/60Hz at 12 Amps
220 Volts ~ 50/60Hz at 7.5 Amps
230 Volts ~ 50/60Hz at 6.5 Amps
240 Volts ~ 50/60Hz at 6.5 Amps
Standby, less than 0.5 watt

Refer to the rear panel of the MC901 for the correct voltage.

Overall Dimensions

Width is 17-1/2 inches (44.5cm)
Height is 13-1/4 inches (33.7cm) including feet
Depth is 29-1/2 inches (74.9cm)

Weight

180 pounds (81.6kg) net
200 pounds (90.7kg) in shipping carton

Shipping Carton Dimensions

Width is 24-13/16 inches (63cm)
Depth is 36-1/4 inches (92.1cm)
Height is 18-3/8 inches (46.7cm)



McIntosh Laboratory, Inc.
2 Chambers Street
Binghamton, NY 13903
www.mcintoshlabs.com

The continuous improvement of its products is
the policy of McIntosh Laboratory Incorporated
who reserve the right to improve design without
notice.

Printed in the U.S.A.