

MATCHLESS

MUSICAL INSTRUMENT AMPLIFIER

For All Lightning Models

INTRODUCTION

Thank you for choosing a MATCHLESS brand instrument amplifier. Your amplifier has been carefully hand-crafted using only quality materials. The chassis of your amplifier is completely hand wired employing construction techniques of military electronics manufacturers. We utilize point to point wiring instead of a printed circuit board. The wire used is silver coated stranded copper in a Teflon jacket for extra resistance to heat and decay. We use porcelain and mica filled phenolic tube sockets that are shock mounted to a rugged welded steel chassis. Our hand wound transformers are designed for 100 % duty cycle. Vacuum tubes are selected for tone, low noise, and performance. Output tubes are carefully matched for power, balance and long life. This kind of craftsmanship and attention to detail enables us to offer to the purchaser our six-year guarantee.

MATCHLESS amplifiers are built ruggedly, and aside from the periodic tube or indicator lamp replacement, should require very little maintenance. We have designed every MATCHLESS product to be a trouble-free workhorse and hope you enjoy yours for many years to come!

FEATURES

Your MATCHLESS is a straight forward amplifier devoid of bells and whistles. It is an all tube design in the classical sense, employing a vacuum tube rectifier and iron core inductor choke in the power supply. The power amplifier is operated in a Class A mode. Cathode bias is employed in the output section and no negative feedback is used around the amplifier. This configuration offers superior tonal performance, rich in harmonics.

OPERATION: GENERAL

Your MATCHLESS is an all tube design. If your experience is limited with regard to vacuum tube instrument amplifiers, you should become familiar with the characteristics that differentiate vacuum tube designs from their solid-state counterparts aside from the tone or sonic performance.

1. Vacuum tube amplifiers require a "warm up" period of up to one minute before they become operational, and they usually sound better as they "cook". This is due to the fact that electrons only flow when the cathode of a tube is fully heated. This is also the reason vacuum tube amplifiers run so much hotter than solid-state designs.

2. Care should be exercised when handling vacuum tubes especially when an amplifier has been operating for a while. The rectifier and output tubes operate much hotter than small preamp tubes, so extra care should be taken when handling them.

NOTE: MATCHLESS amplifiers are biased hot and should not be allowed to idle with no input signal for long periods of time.

3. Tube type amplifiers are inherently sensitive to speaker impedance matching. This is due to the relationship of the internal resistance's of the output transformer, the output tubes, and the load they are required to drive. A load imbalance can cause loss of power, self-oscillation, or excessive current to flow in the output stage. In severe cases this condition can cause the output transformer to run hot and may damage or destroy the output tubes. This kind of damage is not covered by a warranty.

When it is desired to use additional speakers with an amplifier, or multiple speakers with an amp head, it is necessary to calculate the proper impedance setting. This is easily accomplished using a simple Ohm's law formula:

<u>FORMULA:</u>	$\frac{\text{Load 1} \times \text{Load 2}}{\text{Load 1} + \text{Load 2}}$	<u>EXAMPLE:</u>	$\frac{8 \text{ Ohms} \times 8 \text{ Ohms}}{8 \text{ Ohms} + 8 \text{ Ohms}} = 4 \text{ ohms}$
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The correct setting for two 8 ohm cabinets connected in parallel should be the 4 ohm setting at the amplifier. It is also possible to connect speaker systems of unequal impedance values using this same formula, simply set the impedance switch to the value closest to the result. Remember that volume output may also be unequal, as the lower impedance speaker is likely to be slightly louder because it demands most of the power from the amplifier. Also be sure that the power handling capacity is adequate.

POWER SOAK DEVICES

The use of "power-soak" devices is not recommended on your amplifier. These devices can severely shorten the life of the output tubes which should be replaced as a matched duet. Replacing vacuum tubes can be quite expensive. If however one of these devices is an integral part of your sound, choose one that is well designed and built by a reputable company. When the amplifier starts to sound dull, it's time to replace the output tubes. Always replace tubes with premium quality tubes only! Cheap tubes will not sound good and will not last. MATCHLESS sells replacement tubes for all models. Please contact your dealer or call the factory.

ABOUT THE SPEAKER

The Lightning model employs a specially modified Celestion speaker. This speaker is rated at 15 watts of continuous power, which is more than enough to handle any type of playing. The cabinet is specially designed and tuned for this specific speaker and amplifier combination. The speaker is rated at 8 Ohms and should be plugged into the 8 Ohm output jack. Other speakers may be used with your amplifier and the internal speaker may be defeated simply by unplugging it. Do not plug speakers into 4 Ohm and 8 Ohm outputs simultaneously.

Remember to never operate the amplifier without a load, otherwise severe damage can result. This damage would not be covered by the manufacturer's warranty.

OTHER FEATURES

Your Matchless is provided with a detachable line cord and employs a replaceable main fuse for protection against shock and damage to internal components.

ABOUT THE FUSE!

Your MATCHLESS amplifier employs a line safety fuse for protection against damage. The line fuse offers protection against irregularities in an A.C. source, tube failure, component failure, severe overload to the output amplifier, and other conditions that prove unsafe or damaging to the amplifier. If an amplifier blows a line fuse, an investigation into its cause is required. Correct any problems that may be found before putting the amplifier back in service.

Never replace a line fuse with one of a higher amperage rating! Not only is it unsafe, but it leaves your amplifier unprotected in the event of a tube or component failure and voids your warranty.

Following find the correct fuse size for your amplifier:

For domestic use (USA, Canada, and Mexico)	3AG size	2 Amp Fast
For export models (Europe) 220-240 Volts	3AG size	1 Amp Fast
For export models (Japan) 100 Volts	3AG size	1 Amp Slow

SWITCHES AND INDICATORS

POWER: OFF/ON

This switch supplies power from the A.C. mains and is used to turn the amplifier off and on. The amplifier on status is indicated by the illumination of the front panel or dashboard.

INPUT AND OUTPUT JACKS

INSTRUMENT INPUTS:

Lightning amplifiers have two input jacks on the front panel marked input "1" and input "2". Input "1" is the primary input and offers maximum gain at the preamplifier. Input "2" is a buffered input and offers less gain at the preamplifier. This input can be used with very hot instruments to prevent overload and unwanted distortion. It is recommended that the user experiment with both inputs and become familiar with the difference of performance especially if more than one instrument will be used with the amplifier.

OUTPUTS:

Your amplifier provides two speaker output jacks, one 4 Ohm and one 8 Ohm. The internal speaker is rated at 8 Ohms and should be plugged into the 8 Ohm output jack. The output of your amplifier is conservatively rated at 15 Watts RMS and is capable of driving a variety of speaker cabinets with excellent results. Be sure to observe the correct impedance match when using external speakers.

LINE OUTPUT:

There is a Line Output jack on the back of the amplifier which can be used in a number of ways. The line out can be used as a slave out to drive another amplifier or as a direct out to feed a line level signal to a recording board or public address system. The line out signal is obtained after the power amplifier and is a true representation of the full tonal spectrum of the amp. The line output impedance is rated at 3300 may be used with the speaker defeated only if a resistive or other acceptable load is connected to one of the speaker output jacks. The line output impedance is rated at 3300 Ohms. The line output may also be used to feed a signal to an external effects device. The overall level of this signal is directly related to the level set on the amplifier.

CONTROLS

The Lightning provides three user controls.

The Master volume control adjusts the overall gain of the output amplifier. Normally this control is set at the maximum (fully clockwise) position. This allows the power amplifier to operate at full gain. This would be the normal configuration for a cleaner sound. For a dirtier sound, the Master volume control enables the preamplifier to be overdriven without having the amplifier at full volume.

The Volume control adjusts the gain of the preamplifier. With the Master volume wide open use the volume control to adjust the overall loudness of the amplifier.

The Tone control consists of a high-gain pentode coupled to a six position tone switch. Outright benefits include quick dial-in of new tones and an easy return to your preferred new settings.

MAINTENANCE

Aside from routine vacuum tube and indicator lamp replacement, your MATCHLESS should require very little in the way of maintenance. Periodically examine the four output tubes visible from the rear of the chassis. Any tendency of one or more of these tubes glow reddish in the plate area is an' indication of an imbalance in the amplifier. This should be checked out by a technician or by substituting a fresh set of matched output tubes. If over a period of time or hard playing the amplifier sounds weak or dull, this may be an indication that the output or preamp tubes are "tired/J and probably need renewal. If one or more of the preamp tubes become abnormally microphonic or the amplifier whistles with the controls at maximum (with nothing plugged into the inputs) a replacement may be required. When replacing output tubes, remember that they are a matched set and should be replaced with a matched set.

VACUUM TUBE REPLACEMENT

Never attempt to replace vacuum tubes while the amplifier is on or the amplifier is hot. To replace tubes remove the back panel of the amplifier. Preamplifier tubes usually have a twist-lock shield that must be removed before the tube can be removed from the chassis. Output tubes and rectifier tubes employ either a spring and a cap arrangement (called a tube hat) or a base clamp. The base clamp is loosened by un-tightening the screw on the side of the clamp. The spring and cap version is gently lifted off the tube and moved out of the way. When replacing output tubes, always check the amplifier out before replacing the back panel. Make sure that the amplifier functions normally and that none of the tubes appear to be overheating. You can detect if a tube is overheating by a reddish glow from the plate area or if the tube is abnormally bright. If all looks well, replace the shields, caps, or re-tighten the clamps. Replace the rear panel and test the amplifier again.

CAUTION!

Never place drinks on top of the amplifier for obvious reasons. Liquids can cause the glass envelopes of the hot vacuum tubes to crack, possibly shorting out the amplifier. Liquids can also cause damage to switches and potentiometers and generally reduce the reliability of your amplifier as well as require an expensive repair. If an accidental spill does occur, remove the amplifier from the cabinet, remove the tubes, and thoroughly clean and dry the chassis before attempting to use the amplifier.

Be mindful not to restrict airflow to the back of the amplifier.

Never replace the protective fuse with one of a higher amperage rating. If an amplifier starts blowing fuses, it may be a warning of an impending problem and should be looked over by a professional.