

MATCHLESS

MUSICAL INSTRUMENT AMPLIFIER
For All Avalon 30 and 35 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 a Hybrid method of point to point wiring, turret style, and printed circuit board. The board in the Avalon series utilizes 3 oz. copper tracing. The wiring is silver coated stranded copper in a Teflon jacket for extra resistance to heat and decay. We use chassis mount tube sockets that are rivet mounted to a rugged welded steel chassis. Our hand wired paper bobbin transformers are designed for 100% duty cycle. Vacuum tubes are selected for tone, low noise and performance. This kind of craftsmanship and attention to detail enables us to offer to the purchaser our six year guarantee. MATCHLESS amplifiers are ruggedly built, 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, roadworthy, studio quality amplifier.

FEATURES

Your MATCHLESS is a straight forward amplifier devoid of bells and whistles. It is an all tube design including the power supply rectifier. Cathode bias operation is utilized for the output stage. The top-boost channel uses two 12AX7's tubes in the first preamplifier.

All Avalon amplifiers incorporate a *MASTER* volume control feature. Only 30 Watt EL-84 based Avalon amplifiers will come standard with a *HI-LO* power setting switch enabling the artist to take full advantage of the harmonic rich nature of an all vacuum tube design.

An effects loop is a standard option for the Avalon series. MATCHLESS *Avalon* amplifiers may be ordered as single combo speaker as well as separate head and cabinet configuration.

OPERATION: GENERAL

Your MATCHLESS is an all tube design. If your experience is limited with regard to vacuum tube instruments amplifiers, you should become familiar with the characteristics that differentiate vacuum tube designs from their solid-state counterparts... *Aside from the tone and 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 design.
2. Many vacuum tube amplifiers incorporate a STAND-BY switch, which aside from muting the amplifier, performs a more valuable function of removing current from the circuit while

allowing the *heaters* to remain energized. The STAND-BY mode is used during short breaks and is usually preferred to turning the amplifier off. This allows the amplifier to cool and greatly enhances the useful life of the output tubes.

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 and destroy the output tubes. This kind of damage is not covered by the warranty. The impedance switch, located at the rear of the chassis, is used to match the amplifier to the speaker load. This rotary switch has three positions and can match the amplifier to four, eight, or sixteen ohm loads. This switch should be set before the amplifier is turned on. MATCHLESS single and four-ten cabinets are normally eight ohms. Dual speaker models are normally four ohms.

When it is desired to use additional speakers with the amplifier, or multiple speakers with an amp head or combo in conjunction with an additional 112 speaker cabinet, it is necessary to calculate the proper impedance setting. This is easily accomplished using a simple "Ohm's Law" formula:

$$\text{FORMULA: Load 1 x Load 2 EXAMPLE: 8 Ohms x 8 Ohms} \\ \text{= 4 ohms} \\ \text{Load 1 + Load 2 8 Ohms + 8 Ohms}$$

The correct setting for two 8 ohm cabinets connected in *parallel* should be the four ohm setting at the amplifier. It is also possible to connect speaker systems of unequal impedance values using the same formula, simply set the impedance switch to the value closest to the result. Remember that volume output may be 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 quartet*. 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 sell replacement tubes for all models. Please contact your dealer or call the factory at (310)-444-1922.

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 "MATCHLESS" logo on the front of the amplifier.

STAND-BY:

This switch serves as a mute for the amplifier, and is used when changing or unplugging a guitar cord or taking breaks, especially if volume control settings are to be set and left. Additionally, the *stand-by* mode allows the amplifier to cool down before shutting off the AC power switch, extending the life of the output tubes. Substantial amounts of current flow through the output tubes whenever the amplifier is *operational*, even with *no signal from an instrument!*

PRECAUTION! Cathode biased class A amplifiers do not like to "idle" for prolonged periods. These amplifiers draw more current idling than they do while being played. Use the stand-by mode or turn the amplifier off if you are not going to play for a while. Save your tubes!

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 may leave your amplifier unprotected in the event of a tube or component failure and voids your warranty.

Use this chart to determine the correct fuse type for your amplifier:

C-30 Chassis (USA) 3AG size 3 Amp rating

C-30 Chassis (Japan) 3AG size 3 Amp rating (Slo-Blo)

C-30 Chassis (Europe) 3AG size 2 Amp rating

For amplifiers designed to operate at non-standard voltages, the required fuse size and rating will appear on the manufacturer's tag affixed to the inside of the amplifier cabinet, or at the fuse holder on the chassis. When in doubt, consult your dealer or contact the factory. If you are traveling with your amplifier, and are uncertain about the voltage requirements and fuse type, please contact the factory. In some countries the line voltage may vary slightly from the voltage at which an amplifier may be set. This may require modification of the fuse rating.

In most cases the Rectifier Tube and or Power Tubes that have gone bad will be the cause of your fuse blowing. Always have spare tubes and spare fuses on hand when using your amplifier.

PREAMPLIFIER SECTION

Your MATCHLESS amplifier is a Single Channel Circuit utilizing two 12AX7's one is for input and the other is the cathode follower for tone.

INSTRUMENT INPUTS:

Your MATCHLESS Avalon amplifier has two inputs one High Input and One Low Input. The purpose of having two inputs is that the upper input (input 1) provides more gain a brighter top end. The lower input will reduce the volume slightly and warm up the top end, making the signal less bright. Instrument pickups vary in signal strength and the user may find one input offers a better *match* than the other, and this may vary among instruments. As a rule,

older instruments usually have lower output strength and may sound punchier through the input with more gain (input 1), while instruments with newer style pickups that *may be much hotter*, may perform satisfactory with less gain (input 2), and improve the headroom of the amplifier. Feel free to experiment and decide for yourself which input sounds best with your instruments.

Pre-Amp

This channel has three controls, VOLUME, BASS, and TREBLE. This is a “triode” channel. This channel offers a two stage active tone circuit employing a second pair of triode amplifiers. This circuitry is popularly referred to as a “*tone-boost*” or “*treble-boost*” circuit. The Bass and Treble controls are highly interactive and capable of a wide variety of textures.

POWER AMPLIFIER SECTION

MATCHLESS amplifiers are cathode self-biased and operate mostly in a dual Class “A” mode. This means that current flows continuously through the output tubes whether a signal is present or not. Most amplifier designs employ the more popular “AB” or “AB1” biasing technique, which although capable of producing more power for a given tube configuration and transformer size, produces crossover distortion and more odd order harmonics. This is why MATCHLESS amplifiers are described as having a smooth tone that won’t fatigue ears even at a high volume.

The MATCHLESS design also does away with controlled or corrective *negative feedback*, allowing the amplifier to run “open loop” or wide band. This is why your amplifiers sound full and rich at low or high volume levels.

These are what we call “*features of design*” and very much a part of the distinctive MATCHLESS tone.

There are four controls that enable the user to adjust the parameters of the power amplifier section. The controls are the *HI-LO* power switch, the *CUT* control and the *MASTER VOLUME* control, and the *IMPEDANCE* switch. The impedance switch is used to correctly match the speaker load to the amplifier, as mentioned earlier. This control (*located at the rear of the amplifier*) should be set and left in the proper position before the amplifier is turned on.

“HI-LO” POWER SWITCH:

This switch is located at the rear of the amplifier and determines the overall output power of the amplifier. In the “HI” position all four output tubes are functioning and the amplifier is producing maximum power. C-30 amplifiers are conservatively rated at thirty watts. In the “LO” position, the two outer output tubes are *turned off leaving only the two inner power tubes running* so power is reduced approximately 50%. Cathode bias levels will adjust for each power setting. This function is very useful in recording studios or small clubs where less power may be preferable. The low power setting also produces its own distinctive tone and should be explored fully.

“MASTER VOLUME”

The MASTER volume control function is a Push-Pull Potentiometer activated by pulling out and pushing in. When the Master Volume Control is pulled out, the master volume control circuit is active and will work from 0-10 or full volume. When pushed in the

Master Volume Control is completely in bypass mode, *allowing the signal of the power section to operate at 100% of its capacity*. The MASTER volume control adjusts the overall *volume* output regardless of the Hi-Lo power setting and functions with the Pre-Amp. Normally this control would be set at its maximum (*fully clockwise*) position or bypassed (*switch pushed in*). This allows the power amplifier to run at full gain. This would be the normal configuration for a cleaner sound, while running the Pre-Amp volume control at a lower setting.

For a *dirtier* sound, the MASTER volume control enables the preamplifiers to be overdriven without having the amplifier at *full volume*. Pull out the MASTER volume control to activate the circuit, then turn the control fully counter-clockwise. No sound will come from the amplifier at this point. Now turn the volume control of the channel you are using fully clockwise or nearly so. Turn the Master volume control clockwise until sound is produced from the speakers. Experiment with the settings of both the channel volume control and the MASTER volume control until the desired results are achieved. Remember, if the pre-amp volume control is “cranked” up, and the MASTER volume is turned down, an over-driven sound is produced. Experiment with both controls simultaneously to understand more fully how their interaction affects overdrive characteristics.

By using the Pre-Amp volume, Master volume and the Hi-Lo power setting switch, a wide range of tonal spectra may be explored. Once again, let experimentation be the mother of invention!

CUT:

The CUT control varies the high frequency response of the power amplifier. This is characterized by *fewer highs* or *less top end*. The CUT control is used to soften or take the edge off a harsh instrument or tone setting. The effect is subtle before the halfway point on the control and increases the amount of cut from midpoint to full. *The CUT control is most effective when the Master volume is bypassed or set at higher signal levels. Utilizing a higher setting of the Cut control is ideal for a mellow and warmer and sound.*

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 quartet 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*” 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, make sure they are a matched quartet. Adjusting the Bias is not necessary.

Check to make sure that the filaments can be seen and the tubes are hot when the amplifier is on, if they are cold to the touch and there is not a visible glow the tube is defective. However, simply because the tube glows does not mean it is fully functioning.

***Use EXTREME CAUTION when checking if a tube is warm. Tubes will become very hot and can cause a burn if care is not taken while inspecting. If in doubt please refer to qualified technician to determine if your tubes are defective.

VACUUM TUBE REPLACEMENT

Never attempt to replace vacuum tubes while the amplifier is on or the amplifier is hot. To replace the Pre Amplifier tubes simply pull the Front panel trim piece off of the amplifier. Simply grab a hold of the front panels frame and gently pull forward. The front panel is mounted by Velcro strips to allow easy access for tube replacement.

Preamplifier tubes usually have a twist-lock shield that must be removed before the tube can be removed from the chassis.

Access to the Rectifier tube and the four Power tubes can be made by simply grabbing the rear panel frame and gently pulling out. It is also held on by Velcro strips for easy access.

Output tubes employ a wire spring retainer. Simply unlock the wire retainer from the top of the tube by pushing it off the tube.

The Rectifier tube is simply mounted into its tube socket base and can easily be replaced by pulling upwards. When installing a new rectifier tube make certain that the notch in the tube matches the base sockets notch.

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. This is usually indicated by an abnormally bright tube or a reddish glow from the plate area. If all looks well, replace the shields, caps, or re-tighten the clamps. Replace the rear panel and test the amplifier again.

LOGO INDICATOR LAMP REPLACEMENT

Matchless employs 6.3V incandescent bayonet style lamps to illuminate the logo and the front panel. All the lamps are of the same type for simplicity. A lamp type #44 is recommended for all lamps, although a type # 47 may be substituted if a brighter look is desired.

The lighting is recessed and covered by opaque plexiglass. The cover will need to be removed to access the bulbs.

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 warning of an impending problem with the amp and should be looked over by a professional.

USE IN OTHER COUNTRIES

Your MATCHLESS amplifier is **NOT** equipped with a multiple primary winding enabling the user to set the amplifier for various voltages and line frequencies available in foreign countries. The Avalon series amplifiers are a dedicated and fixed voltage power transformer. They can not be altered to use different AC voltages. All Avalon amplifiers must be ordered in accordance to the regions correct AC Voltage.

OPTIONS:

Effects loops come standard on all Avalon series models.

The effects loop jacks are located on the rear panel of the amplifier.

The effects loop jack is configured in a *Ring, Tip, Sleeve* manner similar to a recording studio console *insert* point. Each jack is of the normalizing type and contains the *send* and *return* information on a single ¼" stereo phone jack. The *Tip* is used for the send signal and the *Ring* is used for the return signal. The *Sleeve* is ground. The SEND signal is derived just after the channel volume control and the RETURN signal is inserted at the phase inverter, *just before the Master volume control*.

A Stereo "Y-cord" is required for loop operation. When the loop is not being used, the signal is "normalized" through the jack.

The effects loop option is intended for use with guitar type foot pedals and semi-pro level rack type effects. It is not designed to drive effects units requiring high level signals (+4), as encountered in a professional recording studio.

Switchcraft plugs are recommend since a Switchcraft Stereo jack is utilized.

(There have been known issues with some Monster Cable Stereo Y Cables.)

ACCESSORIES AND OPTIONS

ACCESSORIES:

Your MATCHLESS amplifier comes supplied with an operation instruction manual, an IEC power cable, a spare fuse, indicator lamp and panel knob.

Getting Started With Matchless Amplifiers Tips On Tone

MATCHLESS manufactures a variety of models, each with its own personality and character. The choice of speaker cabinet type has as much to do with tone as does an amplifier itself. Speaker cabinets with two twelve inch speakers tend to emphasize midrange frequencies and tone texture may be characterized as nasal. The Avalon 112 Combo uses an In House Modified Celestion G12H30 and is rated at 30 watts.