

The Single Ended Lead Options Guide

10.10.04

Hours of fun and frustration with your AX84 amp.

WARNING! - Please Read this Information Carefully:

The project described in these pages utilizes **POTENTIALLY FATAL HIGH VOLTAGES**. If you are in any way unfamiliar with high voltage circuits or are uncomfortable working around high voltages, **PLEASE DO NOT RISK YOUR LIFE BY BUILDING THEM**. Seek help from a competent technician before building any unfamiliar electronics circuit. While efforts are made to ensure accuracy of these circuits, no guarantee is provided, of any kind!

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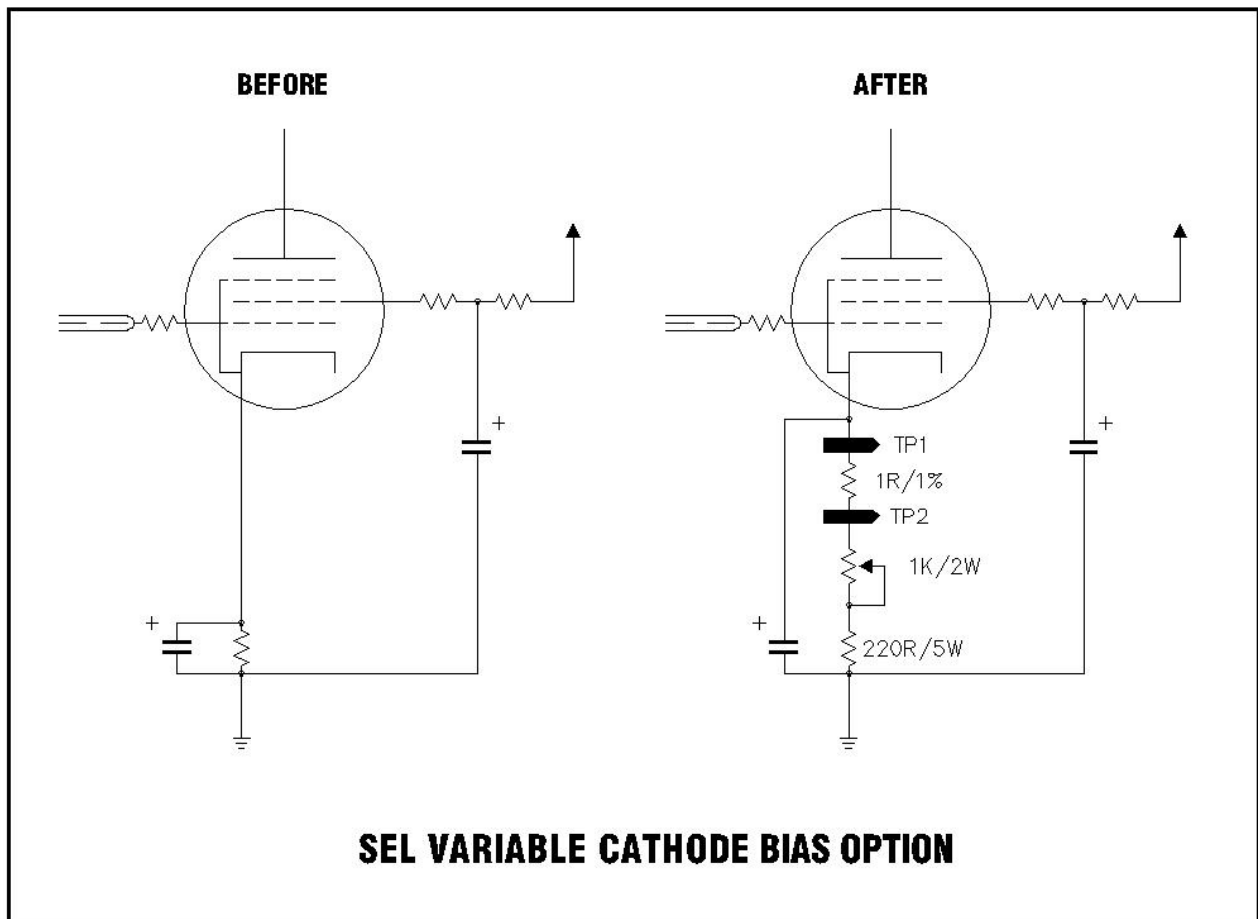
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The Variable Cathode Bias Option

This is a modification that can be made to cathode biased amps like the P1, High Octane, P1 eXtreme, and the SEL. In fact, I make this mod to all of the SE amps I build. By adding one 1K Linear potentiometer, one 1R – 5% resistor, two multi-meter probe test points, changing the existing cathode resistor to a 220R/5W unit, and adding a little wire, you can give yourself the ability to dial in the bias setting you want for any output tube you care to use.



NOTE: The value of the cathode resistor is an estimate ONLY. While the current value of 220R should be correct for a KT88, so individual valves may draw more than the *expected* amount of current, so you should be prepared to adjust this value as required. Also note that if you use a different octal power tube, you may have to lower the resistor value in order to be able to bias the output tube correctly. Once you get the variable bias installed and set, you will need to measure the voltage across the pot and that across the 220R bias resistor. Calculate the power each is handling and adjust the value of 220R bias resistor so that is carrying most of the load. Make sure that the bias pot is not being exposed to more than 1W.

The 1R/5% resistor (the more accurate your resistor, the more accurate your reading), is placed between the two test points. You will use your multi-meter, set to mV, to measure the voltage across the 1R resistor. Since the resistor is 1R, V = mA of current that the tube is drawing.

To set the bias, first insert the positive probe in TP1 and the negative in TP2, and change the dial to mV. Pay attention to the meter. When you dial the pot one way, current (mV) increases. When you dial it the other way, current (mV) decreases. Dial the pot so that the mV reading is as low as it will go.

Now, take a reading of the anode (aka plate) voltage and use the following formula to determine the bias setting for the tube you are using: $(PaMax * 0.9) / Va$

PaMax is the maximum plate dissipation of the tube you are using and Va is the voltage at the anode that you measured. Once you have that number, you simply adjust the bias pot until you see that number on the display.

The Lead/Rhythm Switch

This option is also one I like to install on all of the High Octane's and SEL's that I build. For just the cost of a SPDT switch, you can change between high and low gain settings. In the Rhythm mode the amp is capable of all of the tonal variations of the P1 and P1 Extreme. In fact, because the cathode follower is left in the circuit in both modes, the volume only changes about as much as you would ideally want between lead and rhythm, so you don't need two volume controls.

