

# The High-Octane Modification Guide

08.04.10

*More 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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## James Peters:

Try the following changes:

- R19 = 5K
- Remove C12
- R16 = 120K, R17 = 400K (or thereabouts)

Try the first two, for a more "plexi" type of drive. If there's not enough power tube "jam", try the last point.

The general approach of my suggested "mods" is to reduce some preamp distortion, reduce some preamp gain, increase clipping slightly, and drive the power tube harder. All those elements combined in that way seem to work well.

## Carl Berger:

### The "Raffler" DC Drive Mod

- Replace R15 with a 10K.
- Remove C10.
- Replace R17 with a 22K.
- Replace R16 with a 330K.
- Replace C11 with a .047uF.
- Disconnect VR5.
- Connect R16 (the end that was connected to VR5) to V3A's plate.
- Connect C11 (the end that was connected to VR5) to the V3B's grid.

## Paul Ruby:

### Tuning

I never include the bright cap (C13), on the 220k/220k divider. Always seems to be a bit too much top end to me.

I also never use the cathode bypass cap on the 2<sup>nd</sup> and 3<sup>rd</sup> stages. However, I do like to keep the cathode resistors on those stages low in value to keep plate voltage down a bit. I like the tone better with these stages biased closer to saturation. This is more of a subjective taste thing, however. Higher resistance values will give more distortion because the tubes will cutoff sooner, "A little more hair".

### Squeal

Another thought for reducing squeal would be to reduce the plate resistors on the 2nd and 3rd stage to reduce gain.

One more thought... Moving the bright cap (C13), to the second divider (after the 2nd stage) instead of the first divider might still give the nice Marshall bite without squeal. I just did this in my conversion of a G40V to JCM800 and it worked nicely.

## Brenden:

### Adding Dirt

Remove the 220K's that go to ground between stages. Bias the 1st stage with 220K plate and 1.96K cathode. Those values are for maximum 2nd degree harmonic distortion.

## Aletheian Alex:

### Various

There are some very simple mods that can (in my opinion) improve the sound and stability greatly... moving from the front of the amp to the back:

- Parallel another .68uF resistor with C16 to add a bit more bass punch around the guitar's fundamental frequency.
- Increase the value of C13. to .0022uF, .0033u. or .0047 to drop the frequency of the treble peaking circuit to 150Hz/100Hz respectively for more of that 'modern' high gain curve and a bit thicker sound.
- Parallel a .0047uF film capacitor across the C2 power supply capacitor.
- Place a 500p capacitor in parallel with R23 to reduce the zingy highs there.
- Change R11 to 47K and C7 to 680p for more crunch in the 1500-2000Hz region.
- Instead of grounding the R9 cathode resistor, run it to a transformer tap that will ground it THROUGH the secondary of the output transformer, adding some slight feedback and increasing the bass response. This is especially effective if you used a cheaper Hammond 125 'universal' series transformer.
- Last tip... buy a AX84 speaker cabinet!

### SLO Cold Biased Stage

If you want to try the SLO cold biased stage, you can do it without adding another preamp tube by converting your cathode follower into the cold biased stage, and then scaling your tone stack down to work at the higher impedance that you get running it off the plate. You'll lose about 3dB of voltage gain, but that is no biggie, just turn the master up a bit more.

I like the sound of a 24K resistor much better than the 39K... it doesn't cut out as much of the midrange as the 39k does.

I would scale the tone stack like this to run off of the anode:

- C7=1000p (.001u)
- C8=.01u

- C9=.01u
- R10=100k

I also like to run a little feedback loop from the plate to the grid on those clipping stages... a .047u cap from the plate, in series with a >22M (yes, that is greater than 22MEGS) resistor going to the grid. You can put that right on the tube socket... no problem. It's stabilize the stage, and smooth out the clipping a bit without killing the highs like a snubber... although you can do that too.

## Gainmaster:

### Harshness Reduction Mod:

OK guys, I've got a new one for ya. If you remember, one of the problems I was having with my high gain builds is a scratchy grating sound with the gains maxed and overall, too many highs. One of the guys had a post about a modeling amp that used a 10k/470p in parallel setup on the input instead of the typical 1M resistor to ground. Sounded like just what I needed so I tried it.

It completely cleaned up the scratchy grating sound and had an added bonus. The amp now goes from a nice shimmery, lightly distorted clean to rip roaring Mesa style distortion in a quarter turn of the guitars volume. Unbelievable! Got to get a patent on this. Just kidding;).

There are still some minor issues to work out. I need a little more signal out, lost too much from this mod and the LED mod. Also think I might want a little more highs but want to live with the amp for a while first. Anyway, just thought you guys would like to know. The 10k/470p mod to the input rocks. No need for a second clean channel unless you want totally clean. Somebody needs to try this on an HO and see how it works out.