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Blackheart BH5 with MasterTone Modifications

Thank you for purchasing a MasterTone modified Blackheart amplifier - I hope you will be delighted with the tone and performance of your new amp.

Please read this in conjunction with the Blackheart Manual and observe all the safety notices - remember that there are dangerous voltages inside valve amplifiers.

Why modify the Blackheart BH5?

1. First, let's agree that it's a pretty good little amp and great value for money but, out of the box, it doesn't sound as good as it could because it's made to a price and doesn't always use the best quality components. By changing component quality and values the sound can be opened up and a wider range of tones can be achieved. Adding new components provides an even wider range of sounds.
2. 5watts is TOO LOUD for most people to be able to crank it up and get the true valve distortion sound that they are looking for - even a bluesy crunch will not be achieved until the amp is pretty loud.

In a medium size room, which is where most people have to practice, a 1 watt valve amp can be so loud that you would have to shout really loud to be heard (about 100 decibels) - and around 1/10th of a watt is what is often referred to as "bedroom level" for late night noodling.

By adding a Master Volume control and Power-Scaling™ you can achieve any level and combination of pre-amp and output stage distortion down to less than 1/10th watt. (see <http://www.londonpower.com/pscaling.htm>)

About the modifications

The internet is full of modification ideas for Blackheart amplifiers. I have chosen what I believe to be a successful combination of changes and additions which allow the amp to reach it's full potential and provide a wide range of tones from clean to heavy distortion all at volumes down to 'bedroom level'.

Please note that I am licensed to install Power Scaling™ and use genuine London Power Components for the Power Scaling™ circuit.

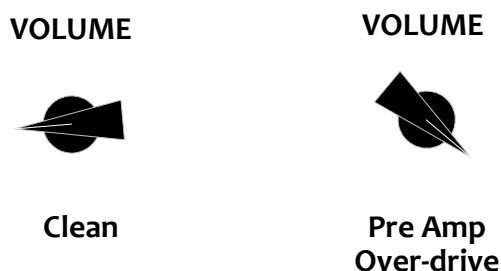
What the modifications do

All the controls work together to create the final sound.

WARNING: The level of distortion available when the Volume and Master volume are set to full AND the Power Scaling control is set towards minimum (8 o'clock) and the Power Scaling Options Switch is set to 'PS-OT' can be extreme. Use these controls carefully at first until you understand how they work together.

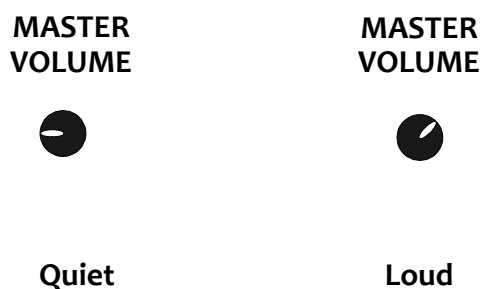
Volume

After my modifications this becomes the pre-amp volume control (also called "Gain" on many amplifiers). This controls how hard you drive the pre-amp valves. Turning this control up overdrives the pre amp and creates a harmonically rich distortion.



Master Volume

This controls the drive of the output stage of the amplifier which allows the user to turn up the Volume control for maximum pre-amp gain whilst keeping the amp's overall loudness at a desired level.



Using the Volume and Master Volume controls you can get some great crunchy tones at low volumes but it is only pre-amp distortion. Personally I like this sound but I prefer it when the output tubes start to distort giving a richer tone. You cannot get output tube distortion at low volumes unless you have some form of power reduction. There is a lot of information on the internet covering power soaks and other types of attenuators. I have tried lots of them including expensive solutions like the THD Hot Plate® but none of them works as well as Power Scaling™. You can get more technical information on the London Power web site at www.londonpower.com/powerscaling_vs_vp.htm

Power Scale

Using Power Scaling™ you can achieve output tube distortion at any volume.

Power Scaling is at its most effective when the Master Volume is turned up but can also provide a tonal change to a clean sound.

The Power Scaling control reduces the power to the tubes as you turn it anti-clockwise. As you turn down the Power Scaling control you will need to adjust the Volume and Master Volume controls to get the exact level of over-drive/distortion that you want.

Once you are near to the sound you will find small changes can make quite a difference to the sound especially when the Power Scale is turned down and you are using a lot of distortion.

**POWER
SCALE**



**MASTER
VOLUME**



VOLUME



Power Switch

The Power Switch has three positions 'off' 'standby' 'on'. The standby position is used to 'warm up' the amplifier before use and to prolong the life of the output valves. When powering up the amplifier always move the Power Switch to 'standby' first. This allows the valves to warm up to their correct operating temperature. After about 2 minutes, when the valves are up to the correct temperature, the Power Switch can be moved to the 'on' position.

To prolong valve life the standby position should be used to turn the amplifier on and off when you want to take a break from playing. When you want to turn the amp off completely, move the Power Switch to the 'off' position.

Other 'unseen' modifications

- Various resistor values are changed to 'correct' issues with the circuit and tone caps are replaced with high quality silver mica and Sprague Orange Drop or Mojo Dijon caps.

FAQ's

Q - **What about other mods?**

A -

- The tone stack can be made switchable for extra gain.
- Changes can be made to additional resistor and cap values to alter the tone and get even more gain.
- Some people fit a valve rectifier (see below).
- If hum is an issue more work can be done to the valve heater circuit.

Q - **What about valve rectifiers - don't they give a 'better' sound?**

A - Some amplifiers exhibit what is known as "sag" when a note is struck due to a drop of voltage in the power supply. This changes the attack of the note and adds to the overall tone of the amp but not everyone will see it as an improved tone.

The Blackheart circuit and others like it (commonly referred to as "Champ" circuits after the Fender Champ) are known as 'class A' amplifiers. They draw an almost constant current so fitting a tube rectifier will not induce sag as there is not enough change in the current to cause sufficient voltage drop. A London Power SUS2 kit can be fitted to induce sag in a class A single ended amp.

Q - **What about changing the speaker? (combo)**

A - Changing the speaker will change the tone/sound of any amp. Whether it is an improvement or not is subjective. You may like a different speaker and the only way to find out is to try changing it. Weber, Jensen and Celestion all make speakers that you can use in the Blackheart as you have 4, 8 and 16 ohm outputs.

And, don't forget that with the 4, 8 and 16 ohm outputs you can use the combo as a head with a separate speaker cabinet.

Q - **What about keeping the triode/pentode switch?**

A - A triode/pentode switch is fitted to give a reduction in output. With Power Scaling™ there is no benefit in using triode mode of operation to reduce the volume.

Q - **What about changing the output transformer?**

A - While the stock output transformer is a little on the small side, it matches the output tube well and the sound is excellent. Changing the output transformer to something like a Hammond 125CSE may increase the level of clean volume and may have an effect on the tone but not everyone wants that change or will think it sounds better.

Q - **What about changing the valves?**

A - The tubes supplied with the Blackheart are unbranded valves made in China. Changing these to good quality branded valves like JJ, Electro Harmonix and Sovtek will change the tone but whether you like the change is subjective - you can't say it's better or worse as it's personal.

Important Notes

Servicing

If you need to take your amplifier to a shop or an amplifier technician for repair please provide the following information to them:

PLEASE NOTE that the Power Scale potentiometer carries a potentially lethal high voltage (around 300 volts) as does the standby switch.

The Standby switch breaks the transformer centre tap - high voltages will be found on some parts of the power supply.

This also applies if you decide to open the amplifier yourself !!

Warranty

I will correct any fault with my workmanship or the parts I fit for 12 months from the date of sale. Warranty applies only to the original purchaser. Warranty is void if the amplifier is altered or modified in any way or the serial number has been tampered with or altered.

Contact

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