

BLACK BOX

ANALOG DESIGN



Vacuum Tube Microphone Preamplifier / D.I.

A DIFFERENT KIND OF PREAMP

(a different kind of company)

While most things these days are made over seas in huge factories with the singular goal of maximizing profits by cutting corners and using the cheapest components, Black Box Analog Design™ does things differently. In fact we take a different approach to most things. We are not interested in creating clones of old gear or building derivatives of popular gear. We are interested in creating gear that does something that hasn't been done before, addresses a need we come across in the studio and takes a new approach to a problem or design.

We are not gear designers. Well, we weren't. We come from the studio world and years ago, our quest to solve certain problems we came across lead us to begin tinkering with circuits of our own. In particular, our frustration with even high end microphone preamps when it came to recording vocals sparked the first design. Since we came from an audio engineering background and not a circuit design background we weren't influenced by standard designs or restricted by thoughts of what we "should" do. Instead we allowed our ears to lead us in the right direction.

Years, and MANY revisions later we have arrived at a preamp that not only sounds incredible but offers an extremely powerful and unique control over how you capture sound.

Every part of the all analog audio circuit is assembled by hand and every component is painstakingly and precisely matched. We use a real, high voltage, linear power supply, custom wound 'Cinemag' transformers and the best quality components made.

This old school approach to creating something is MUCH more labor intensive and costly but the end result is truly a work of art that looks, feels and sounds incredible!

Congratulations on your new preamp!

Robert & Eric

IMPORTANT SAFETY INFORMATION

READ ALL INSTRUCTIONS BEFORE USE



WARNING!

For your safety, the information in this manual must be followed to minimize the risk of electric shock. Failure to do so may result in property damage, injury or loss of life.

IMPORTANT SAFETY INSTRUCTIONS

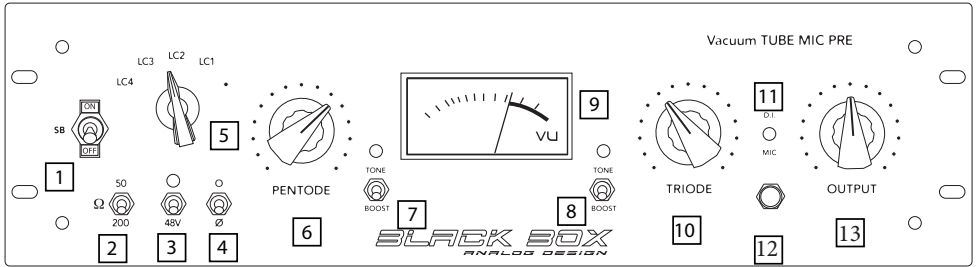


WARNING: This device contains high voltage electricity capable of delivering lethal shocks if used improperly.

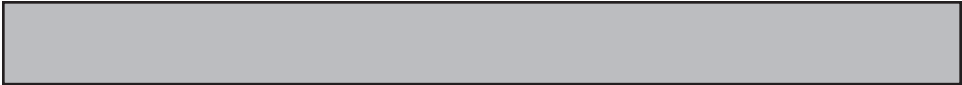
- **Never, under any circumstances operate this unit without being connected to a properly grounded circuit! If you are unsure, consult an electrician to make sure your outlet is properly grounded before plugging the unit in.**
- **Never defeat ground using a ground lift or other device.**
- **Never expose unit to moisture or water**
- **Never connect a microphone to the unit if hands are wet/damp**
- **Do not attempt to service unit or open the case for any reason. Internal capacitors are capable of delivering dangerous shocks even after the unit has been unplugged.**
- **Do not plug in or operate unit if it is visibly damaged.**
- **Never replace fuse with a fuse of a different rating.**

CONTROLS

WHAT DOES THIS BUTTON DO?



- 1 3 way power switch with Off/Standby/On positions: Standby mode sends power to the tube heaters and LEDs
- 2 Input impedance selector: Impedance is switched by tapping into the transformer at different points in the winding
- 3 48 volt Phantom power fed by an isolated, regulated, linear supply
- 4 Phase switch
- 5 5 position, low end roll-off selector
- 6 Pentode gain control
- 7 Pentode "Tone / Boost"
- 8 Triode "Tone / Boost"
- 9 VU output meter: calibrated to -18
- 10 Triode gain control
- 11 Mic / D.I. Switch
- 12 Instrument input
- 13 Passive output attenuation



- 14 IEC power socket
- 15 2AG power fuse: Replace only with the same rating fuse (2amp)
- 16 Master on/off switch: In the “off” position, no power will reach the face plate and the front panel power switch will be inoperable. Be aware that in the “on” position, power is present inside the box even when the power switch on the front panel is in the “off” position.
- 17 Balanced microphone input
- 18 Balanced output

INTRODUCTION

READ ME!

While no one likes to read manuals, the *Black Box Analog Design*™ Vacuum tube mic pre is different than any other microphone preamplifier both in how it's built and how it functions so taking a few minutes to understand the approach and controls will have you getting great tones MUCH faster!

WHAT IS SO DIFFERENT ABOUT IT? (AND DOES IT REALLY CHANGE HOW I USE IT?)

Most microphone preamplifiers do one thing: increase the gain of a signal. While that is great, we think a pre should do more. We think it should be able to help you dial in tones and character right there at the first stage.

The *Black Box Analog Design*™ pre allows you to control how you capture a sound and get it right before you ever hit tape or your converters! And yes, it does change how you use it! In fact, once you get used to the controls, dialing in a tone and finding the sweet spot feels more like playing an instrument than using

Can't I just use an EQ to get the same result?

Nope! While the pre does give you an incredible amount of control over the frequency response, we don't do it with an EQ. When using a channel strip or EQing a signal after the preamp stage, you can only cut or boost what the microphone and preamp have captured. You cannot boost things that are not there and you cannot change how the microphone and preamp picked up the sound. You also have the artifacts and associated phase shifts of the EQ.

With this in mind, we designed our pre to actually give you control over how the microphone hears! Our unique circuit topology not only allows you to change the input impedance that the microphone sees, greatly affecting how it responds but also the impedance between stages. In fact, as you turn the gain knobs you are not only changing the gain of the tubes but also the impedance feeding the next stage. The result is an incredible amount of control over how the microphone and preamp "hears" and also changes how you use the controls to dial in a sound.

GETTING STARTED



PRE FLIGHT CHECKLIST!



- Always put preamp in “standby” for at least 20 seconds before turning on. This will greatly increase the life of the tube.
- Make sure output is turned down before powering unit on. This will avoid any pops and is just good practice.
- With the unit on and volume down, switch the “LC” selector and each mini toggle through each position a few times. This will charge the capacitors and avoid pops during your session. You will know they are charged when the VU meter stops jumping as you switch back and forth (a little is ok).
- Make sure both “boost/tone” switches are in the middle “off” position.

Things you should know!

To avoid “Why isn’t my pre working properly?”

We put the sonic possibilities and character above everything else! Most companies will make sure a product is “idiot proof” even at the expense of the sound. We refuse to do that and feel that capturing the richest sound is worth the small trade offs or extra care needed when using the unit.

- Your preamp is capable of an incredible range of tones and accordingly, not all of them will be good! Just like a guitar amp, the flexibility to control your tone gives you the ability to find settings that are less than pleasing. Essentially, we are putting a lot of control in your hands, including the ability to get distortion and lots of other fun artifacts. Enjoy it!
- The “tone” boost switches are designed to be used one at a time with the “triode boost” switch being the master. Regardless of the position of the “Pentode boost” switch, engaging the “triode boost” switch will automatically disengage it.

SO HOW DO I USE IT?

The most important thing to remember is that unlike other preamps, **when you turn the gain knobs, you are also changing the tone**. The second thing to remember is that **what you do at one stage affects the others**. While this seems odd at first (and is exactly why we wanted you read this before firing it up!), it actually allows you to have an amazing amount of control. Instead of simply turning the gain up one stage at a time, the best way to get a feel for the unit and dial in a sound is to actually **use both hands to turn the Pentode and Triode stages together in different combinations!** See how the sound changes!

But if my gain is linked to tone, what if I like the tone but don't have enough gain (or too much)?

Aside from balancing the stages against each other, there are two other controls that allow you to adjust gain. The first is your output knob which is an entirely passive output attenuation. This is of course where you dial back the signal to an appropriate level for whatever comes after the pre. The second control is the "Boost/Tone" switch at each stage which allows you to add either an overall boost or a tonal boost of that stage.

QUICK START

- **Remember that Pentode and Triode gain knobs adjust tone**
- **Turn Pentode and Triode knobs together in different combinations**
- **Remember that if either gain is at zero, no sound will pass**

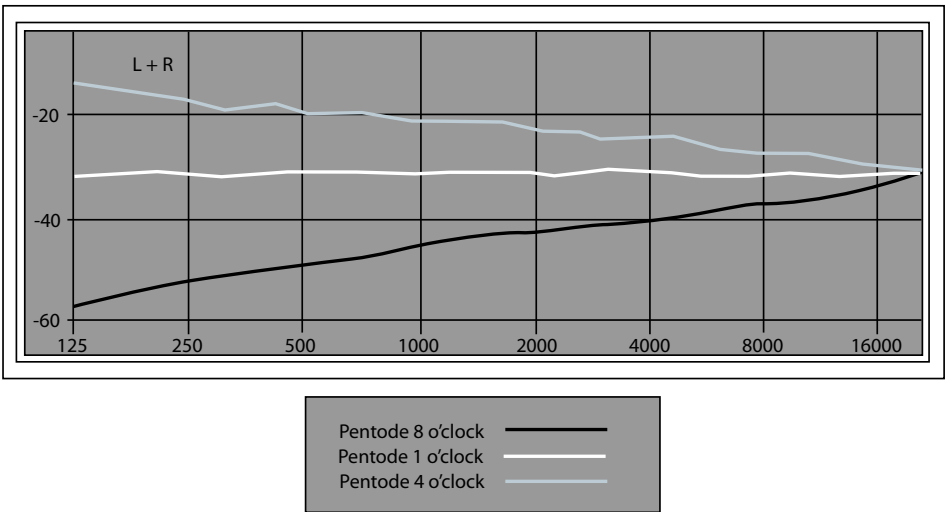
SHAPING TONE

A CLOSER LOOK

While finding the sweet spot and getting the right tone with the *Black Box Analog Design™* pre is more about feel than anything, it is still helpful to know how each part of the circuit behaves and reacts. This section goes into more detail about how each control affects the tone and gives some ideas

Pentode Stage

The Pentode stage gives you the most extreme control over the frequency response of the mic/pre combination. In the graph below you can see how the Pentode has a frequency response that “tilts” around a fixed top end depending on the gain setting.



Along with control over the frequency response, the Pentode can be pushed into the Triode much the way you can drive one stage of a guitar amplifier into the next. The result here is of course much more subtle but it can have a very pleasing effect.

SHAPING TONE

Triode Stage

The Triode stage of the circuit is located after the Pentode stage. The curve shift of the Triode is much less extreme than the Pentode and adds nice second order harmonics. In fact, when you increase the gain beyond a certain point, **the Triode stage brings up the harmonics at a rate of about 2:1 over the fundamental**, allowing you to add a ton of pleasing harmonics!

Boost / Tone

On either side of the VU meter you will find a 3 position switch labeled "Boost/Tone" with a color changing LED located directly above it. In the **center position** the circuit is inactive and the LED is unlit.

In the **"tone" position**, a tonal boost is added by revoicing the tube. The LED will be red in this position. On the Pentode side, engaging the circuit adds a broad mid boost centered around 1K and on the Triode side an "air" boost/shelf starting at 10K.

In the **"boost" position**, engaging the circuit adds an overall boost without changing the frequency response of the corresponding stage. The LED will be green in this position.

DONT FORGET

**Engaging either boost on the Triode side
disengages the Pentode boost**

Input impedance 50/200

Unlike most impedance switches on preamps today, we use real impedance switching by tapping into the specially made transformer at different points in the windings. The “50” and “200” settings correspond to the output impedance of the microphone it is designed for rather than the actual impedance of the transformer.

While “50” would usually be used for ribbon microphones, it sounds amazing on condensers and dynamics alike. In “50” mode you get a very mid-forward sound and an increase in gain and punch. The best way to describe the difference on a vocal track for example is the difference between an uncompressed vocal and a gently compressed one. It can do wonders for lead vocals and they often sit in the mix with authority right where you want them. This setting also allows you to back a singer off the microphone while still capturing all the detail without any of the excess sibilance, mouth noise and proximity issues.

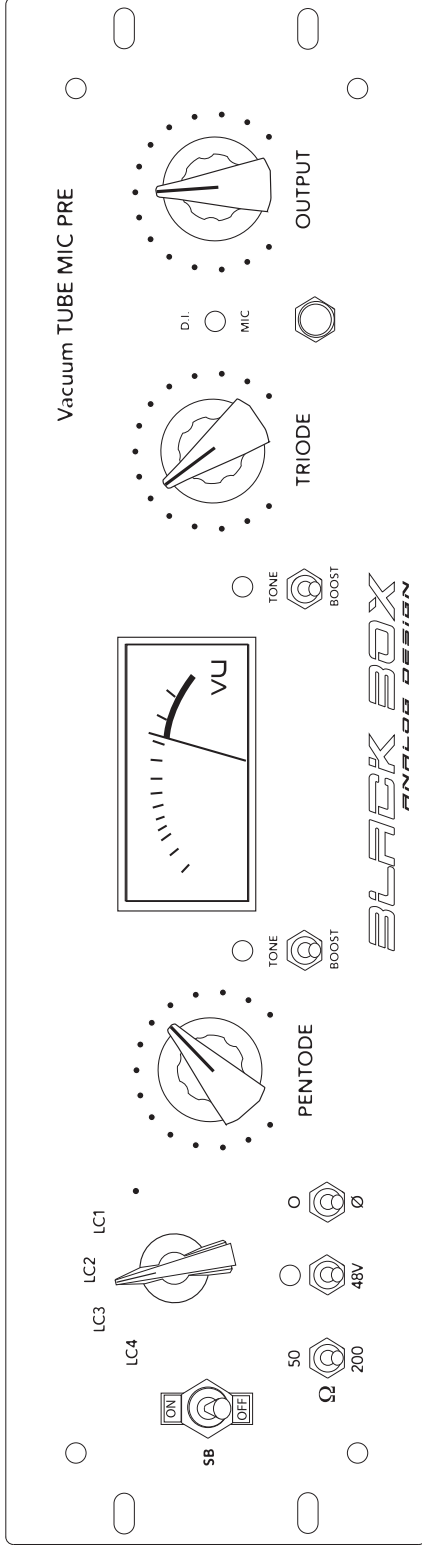
The “200” setting is a more standard setting and sounds more “relaxed”. It works well for backing vocals or stacks that sit perfectly in the mix and gives a very natural response on any source.

Low Roll-off

This simple roll-off circuit is built directly on the switch with nothing but high quality analog components in the path. It has been designed to give you a gentle roll off that allows you to filter out unwanted low end without adding large resonance peaks at the cutoff frequency.

SESSION: _____ DATE: _____

TRACK: _____



NOTES:

