



## Whitestone P331 Tube Loading Amplifier Owner's Manual

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## INTRODUCTION

Thank you for deciding to add the Whitestone Audio Instruments P331 Tube Loading Amplifier to your audio production tool set.

Whitestone Audio Instruments P331 Tube Loading Amplifier had its genesis when my wife (and multiGrammy® nominated mastering engineer) Kim Rosen was looking for a custom piece of analog gear for her new mastering room. Something unique.

We ended up brainstorming on an idea for a versatile tube stage for her analog chain. Much of the way Kim works is exploiting the sound of the input and output gain stages of some of her favorite equalizers and compressors with actual processing bypassed. Just the enhancement some of these analog gain circuits provide often times is just the thing to add a bit of “magic”. The goal for the P331 was to capture this kind of enhancement potential in a line amplifier that delivers the natural clarity of a well-designed tube circuit. At the same time, we wanted to bring fully switched controls that introduce harmonics and other carefully implemented, and repeatable, non-linearities to enhance the signal without harming the recording’s original intent. We really had no idea what we were getting ourselves in to!

For the next five years we worked with our electrical engineer, (who’s other position of employment involves projects he doesn’t have clearance to discuss) on how to implement the features we envisioned...circuit design, prototypes...add features, scrap features, new prototypes, listen...tweak... build revisions...listen some more... tweak some more...over and over. We’re so happy we didn’t throw in the towel (we nearly did on several occasions) because we feel what we’ve ultimately created is a truly unique, truly exceptional processing device.

We wanted the P331 to have just a few great sounding and useful features. Chief among them being its Class A fully-differential (balanced) tube amplifier designed around 6SN7 dual triode vacuum tubes.

This tube was introduced in 1939 and while the 6SN7 is somewhat rare in pro audio applications, it is relied upon in the hi-fi market for its inherent “clean and silky” characteristics in audiophile preamps.

The tubes are still in production and can be purchased new without hassle.

Taking mixes to new levels without harming what’s already there is what the world’s best mastering engineers dedicate their life’s work to achieving. With that in mind we set upon designing features into the P331 that never sound overly processed, unnatural or heavy-handed. From the gentle parallel LIFT filter to the optional output

transformers and clean solid-state output gain, all aspects of the P331 were designed to provide a tool which helps achieve that elusive element, that “something special” which is difficult to describe but unmistakable when heard.

We believe a great sounding recording is the sum of an accumulation of subtleties. With the Whitestone P331 Tube Loading Amplifier, we’ve worked to put a palette of these subtleties at your fingertips.



Dave Rosen  
Co-Founder/President

## **UNPACKING & INSTALLING**

### **UNPACKING**

Make sure to carefully inspect the P331’s carton for any signs of shipping damage. If you find damage from shipping, please contact your dealer right away for further instructions. We strongly recommend you not discard the P331’s carton and custom foam insert. These cartons were specifically designed to protect the P331 during shipping and will ensure your P331 will remain protected if you ever need to send in for service.

#### **The carton contains the following items:**

1. P331 Tube Loading Amplifier
2. Three prong IEC power cord
3. This manual

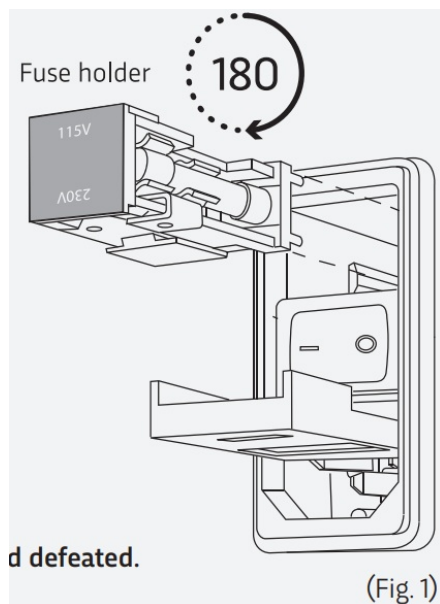
### **MOUNTING**

The P331 uses two EIA standard rack spaces and can be mounted in any standard 19” (482.6 mm) rack. If the P331 is used in a mobile rack or road case, the rear of the chassis should be supported to help prevent against damage from mechanical shock and vibration. Please handle your P331 with loving care and it should deliver many years (or many decades) of high performance, high fidelity audio processing.

### **VENTILATION**

It is important to adequately ventilate your P331 as it does contain two 6SN7 vacuum tubes and high voltage power supply which produce heat. The side panel and top panel vents should never be blocked. We suggest leaving one rack space above and below the unit.

### **POWER REQUIREMENTS**



The P331 is shipped with a 3-prong IEC power inlet module and cord and has a custom-designed universal power supply that can operate in all countries around the world. When purchased new the power inlet will be set for the appropriate voltage. This is indicated in the little red window on the inlet module. Double-check the inlet is displaying the correct voltage for your country before powering up. Operating voltage can be changed by simply removing and rotating the fuse holder 180° within the inlet module (Fig. 1). Please contact us for additional information or if you have any questions. Input power range is 115V to 230V at 50/60 Hz. To check or replace the fuses, make sure the unit is unplugged.

Fuses = T4A L 250VAC SLO-BLO

Never operate the P331 with the ground on the power cord defeated.

## SERVICING



The user should not attempt to service the P331 Tube Loading Amplifier.



NEVER REMOVE THE P331'S TOP COVER. Potentially lethal voltages are present inside the unit. It should only be opened by qualified service personnel. To reduce the risk of fire or electrical shock, do not expose to rain or moisture, or operate it where it will be exposed to liquid. Refer all servicing, or any questions about servicing, to Whitestone Audio Instruments, LLC.

## FEATURES & CONTROLS





The P331 is digitally controlled analog. All switches (rotary and toggle) accurately and predictably command over 80 sealed precision relays. No audio runs to the unit's front panel and only the finest components are used throughout the audio path.

## • TUBE LOADING CONTROL

LOADING controls how the input signal is affected as it travels through the P331's fully balanced class-A tube amplifier. This rotary switch ensures your settings are always precise and repeatable. How and where the input signal hits the tube along its response curve depends on dial settings as well as which MODE the unit is operating in. More detailed info in the OPERATION section of this manual.

## • MODE SELECTOR

The P331's MODE section is controlled by a three position "momentary" toggle switch. When this switch is flipped and held all the way to the right for "a moment" you're able to select between three auto-pad settings. Within each of these three settings (PRE, POST and OPEN) you can control whether the unit will be operating in CLEAN (Feedback) or BLOOM (Feedforward) mode. Again, we'll go into further detail in the OPERATION section.

## • LIFT SELECTOR

The four position LIFT selector switch allows you to engage or fully bypass the P331's parallel lift circuit and select between its three settings. The LIFT filter is a gentle boost of high (HF), low (LF) or both high and low frequencies (DUO) as they pass through and are affected by the tube LOADING circuit. It can be used to add subtle energy to your audio signal where necessary without sounding or feeling like heavy-handed equalization.

## • XFORMER SELECTOR

The P331 is designed to run fully transformer less but offers the option of adding an output transformer into the signal path for additional texture. The XFORMER circuit allows you to select two different ways of loading the transformer (1 or 2) or can be fully bypassed (OUT).

## • BOOST/CUT SELECTOR

The BOOST/CUT selector switch toggles the fully balanced solid-state output GAIN control between BOOST mode, CUT mode or OUT which completely removes the GAIN circuit from the audio path. There is an indicator LED that will alert you when CUT mode is engaged.

## • GAIN CONTROL

This rotary switch allows for up to 11dB of boost or cut in 1dB increments. The output GAIN circuit is a fully balanced low distortion solid state amplifier designed to faithfully reproduce the sound of the audio passing through the tubes and other circuits of the P331.

## • RESOLUTION SELECTOR

The RESOLUTION switch allows you to "back-off" 0.25dB or 0.5dB to whatever setting you have dialed in on the GAIN control. Great for level matching or for getting just the perfect amount of gain out of the unit.

- **VU METER**

The VU Meters are calibrated to "0VU" = +4dBm.

- **METER ATTENUATION**

The P331 is designed to work with hot signals at times so we offer the option of a 6dB or 9dB pad on the meter.

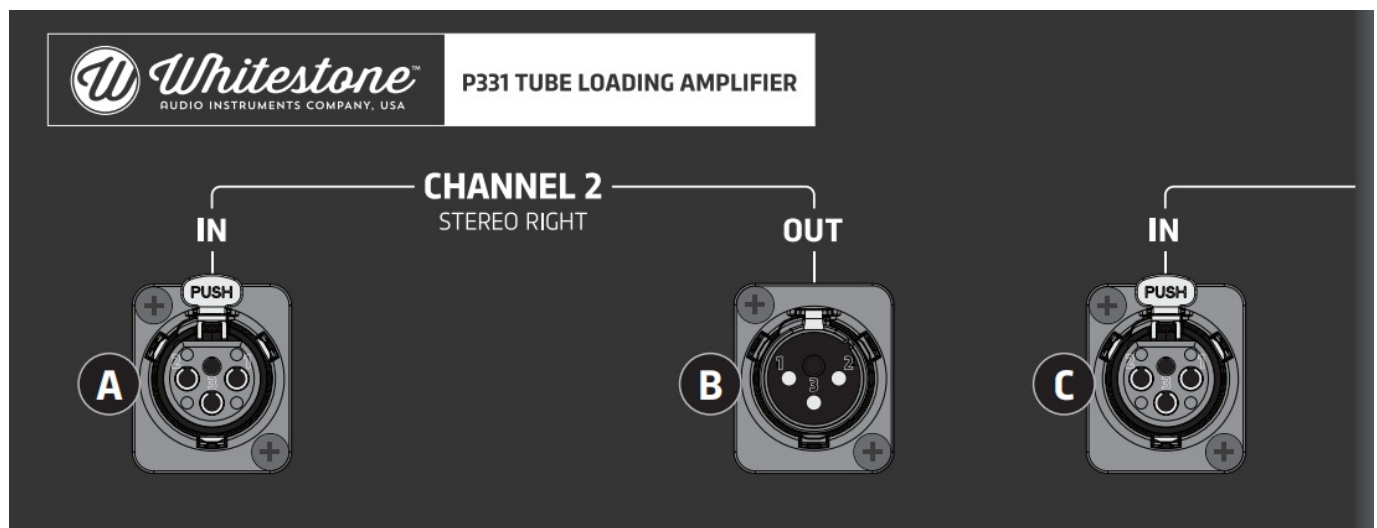
- **BYPASS**

The BYPASS is a true hardwire bypass which effectively removes the entire unit from your signal path. When it's out...it's out.

- **INDICATOR PILOT LIGHT**

The P331 is designed with a timed soft-start power-up that applies voltage to the tubes gracefully. This can help increase tube life and performance over the life of your unit. During power-up, you will see the INDICATOR PILOT gently pulse on and off as this process takes place. During this "warm-up" period the output is automatically muted. When the P331 is ready for use (approximately 3 minutes) the pulsing will stop and the muting will automatically disengage.

## REAR PANEL CONNECTIONS



**THE P331 IS NOT DESIGNED DRIVE UNBALANCED LOADS!**

The P331 is balanced throughout its entire circuit and is not designed to be connected to unbalanced equipment. Some other pieces of pro audio gear have built into their circuit a chip that allows for balanced or unbalanced connections. However, since this chip ends up in the output of the unit it can cause small amounts of distortion... and we made the decision to not (in our opinion) "compromise" the output with this chip when we did so much work to design a fully balanced system.

You can safely run unbalanced gear with the P331, however, it would required being connected with XLR interconnects with pin 3 unconnected and no shorting to ground. Pin 2 hot.

- **XLR INPUT – CHANNEL 2 (STEREO RIGHT)**

BALANCED

Pin 2 Hot

- **XLR OUTPUT-CHANNEL 2 (STEREO RIGHT)**

BALANCED

Pin 2 Hot

- **XLR INPUT – CHANNEL 1 (STEREO LEFT)**

BALANCED

Pin 2 Hot

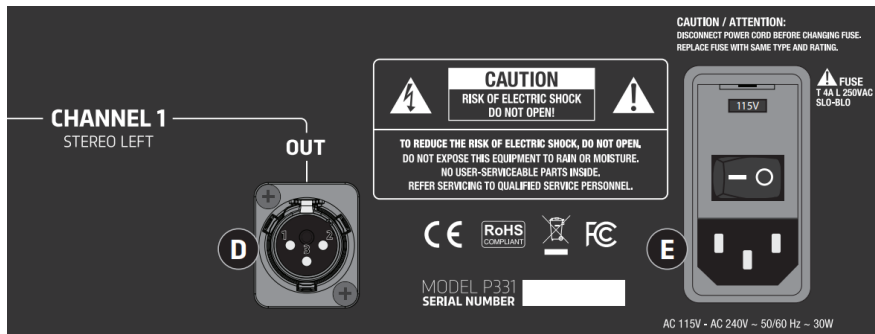
- **XLR OUTPUT-CHANNEL 1 (STEREO LEFT)**

BALANCED

Pin 2 Hot

- **IEC POWER INLET MODULE**

High quality IEC mains connector for 50/60 Hz AC with integrated fuse holder. INDUT MAINE VOLTAGE IEVAC



## OPERATING THE P331 TUBE LOADING AMPLIFIER

The P331 was originally conceived as a mastering and mix buss processor, however, the circuit was designed to enhance anything that runs through it. When we decided to offer this unit to others we didn't want to limit its potential. For this reason we designed it as dual mono as opposed to stereo only. We wanted to ensure tracking and mix engineers had the ability to experiment with enhancing any of their tracks or captured performances. While the P331 does not have the available gain to function as a standalone microphone preamp, it can be used effectively as a worthy addition to any traditional recording chain.

The P331 can be somewhat of a chameleon in that how it reacts is highly dependent on the source material its being fed. We are of the school that there is no right and wrong when it comes to art. Close your eyes, turn the knobs. Ultimately, your ears will and should guide you.

## GETTING STARTED

Make sure all XLR connections are made before hooking up the AC Power Supply cord and powering the P331 on. After the Power is switched to the on position (switch is integrated into the Power Inlet Module at the rear of the unit), the INDICATOR PILOT LIGHT on the front panel will begin to gently pulse. This pulsing indicates the unit is in "warm-up" mode. During this warm up period (approximately 3 minutes) the outputs are automatically muted. Once the P331 is ready for use the pilot light will stop pulsing and will remain lit, the outputs will be automatically taken out of automate and the unit is ready to rock. We do typically, however, let any of our tube gear (including the P331) warm up for 30-45 minutes prior to any critical listening or processing

## LOADING



The soul of the P331 Tube Loading Amplifier is its **LOADING** controls. It's where the tubes live and allows you to vary at which point the audio hits the tube along its response curve. This is accomplished in a few different ways depending on your settings. It gets even more interesting as you experiment with the different modes...as well as the level of signal you feed into the unit. You'll find different recordings are affected in slightly different ways even with the same settings. The enhancement is very much program dependent.

## MODE

There are two main modes to the **LOADING** circuit. **CLEAN** or **BLOOM**. While in **CLEAN** you are operating in "feedback" mode, utilizing the manipulation of feedback to affect internal tube gain. While in **BLOOM**, you're operating in "feed-forward" mode, utilizing the manipulation of plate loading to affect internal tube gain. Two different ways to add subtle harmonics to your signal. Your ears will tell you which is right for the material you're working with.

## AUTO-PADDING (PRE, POST, OPEN)

One of the key elements of the P331's **LOADING** circuit is its auto-padding feature. As gain is increased to the tubes, the signal is padded down in equal measure. This allows for precise and repeatable loads to be applied to the tubes. It also ensures minimal level gain or loss during operation, giving you the ability to audition what the tubes are doing without distraction from drastic changes in level. It's a cool feature and essential to the concept of the unit. To make it even cooler, we provide the ability to control where in the circuit the padding occurs (**PRE** or **POST**) or disable the auto-padding all together (**OPEN**). When in **PRE**, the auto-padding occurs to the signal before it hits the tube. In **POST**, the auto-padding occurs after the tubes. While in **OPEN** the auto-padding is disabled and your Loading knob allows you to crank it up while using your output Gain as a "master volume" of sorts similar to how a guitar amplifier with a master volume would function. It's all about experimenting and letting your ears guide you.

The toggle switch is a "momentary" switch. As you move the toggle actuator to the right, you notice it will "snap back" to the center position. Move it to the right again and you'll notice the LED next to **PRE**, **POST** and **OPEN** will change color.

**PRE = GREEN POST = ORANGE OPEN = BLUE**

You can operate in **CLEAN** (toggle left) or **BLOOM** (toggle center) within any of the three auto-padding

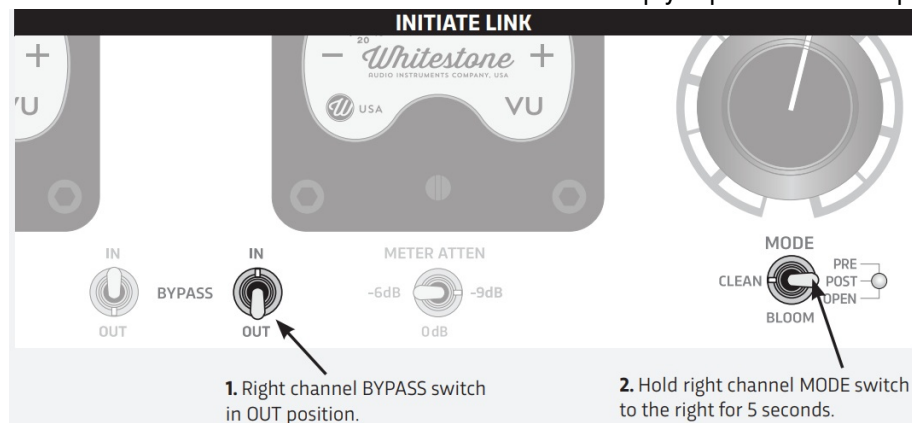


modes.

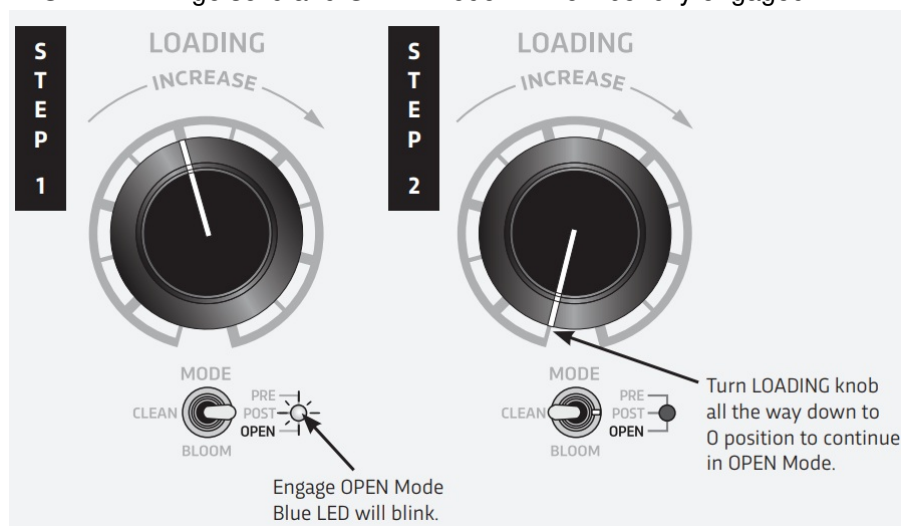
**LINK** – You may work in dual mono as originally designed or activate the Link feature to control both Left and Right channels from the Left side controls. To activate the Link setting, follow the instructions below.

1. Flip the right channel BYPASS switch to the OUT position
2. Flip and hold the right channel MODE switch all the way to the right for 5 seconds.
3. **Note:** The BYPASS is not linked. Both BYPASS switches need to be in the “IN” position for both left and right channels to be engaged.

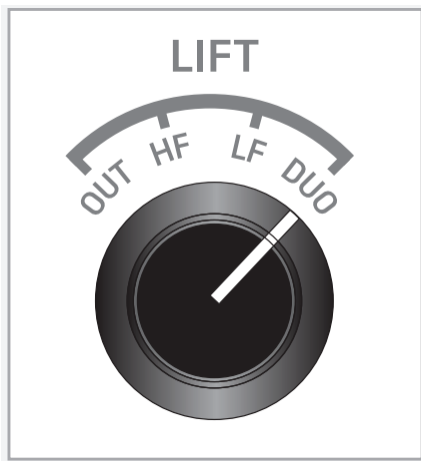
To exit Link and revert back to dual mono control simply repeat the above procedure



**AUTO-CUT IN OPEN MODE** – When activating OPEN mode, all auto-padding is disabled. Depending on where you have your Loading control set there can be a dramatic increase in volume. The Auto-Cut feature addresses this by automatically engaging CUT mode when switching to OPEN mode and forcing you to turn down your LOADING control. If your LOADING knob is turned past the 0 position, this Auto-Cut will be activated. When activated the BLUE LED will blink. Simply turn your LOADING knob all the way down to the 0 position and the BLUE LED will go solid and OPEN mode will now be fully engaged.



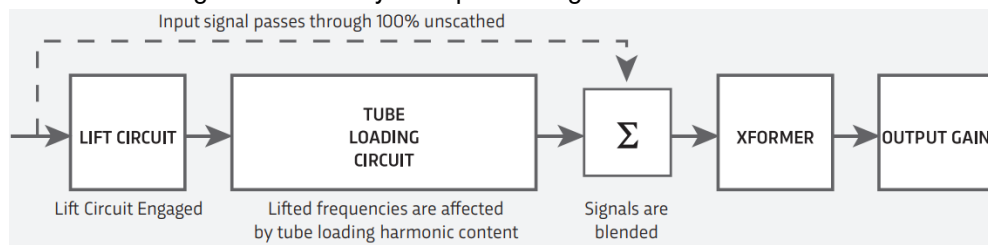
**LIFT**



The LIFT circuit is a gentle parallel filter that enhances the highs, lows or both the highs and lows of the signal. Audio passes through the LIFT circuit before the LOADING circuit. With any of the LIFT filters engaged, the audio is passed unscathed through the fully balanced P331 circuitry and blended with harmonic content of the LIFT and LOADING circuits working in concert.

- OUT = Hard Wire Bypass
- HF = Gentle High Frequency Lift
- LF = Gentle Low Frequency Lift
- DUO = Both High and Low Frequency Lift

We hesitate to specify exact frequencies designed into the LIFT circuit as depending on your settings (and how much the signal is being affected by harmonics) the lifted frequencies can shift slightly. As with all settings and controls on the P331, it's best to simply use your most valuable assets...your ears when determining if the LIFT circuit is working for the audio you're presenting it with.



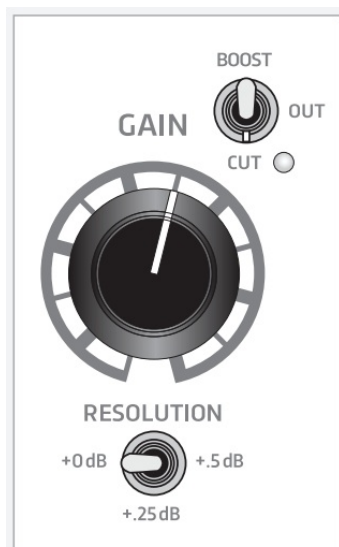
## XFORMER



The P331 is designed to run fully transformerless in its default state. The OUT setting is a hard wire bypass. This provides the purest, cleanest and most unaffected audio path through the unit. However, in keeping with the

P331's versatility, the operator may switch in output transformers and select two optional settings to load them in different ways. This provides additional options for enhancing the subtle textures of your audio.

## GAIN



We decided to give the P331 a clean, fully-balanced solid-state output gain. We weren't interested in coloring the sound here. We wanted the ability to faithfully reproduce what was happening in the LOADING and other circuits while providing the ability to boost or cut up to 11dB in 1dB increments.

For even finer control we added a RESOLUTION switch that allows you to add or "back-off" 0.25dB or 0.5dB to whatever your current setting is on the rotary switch. Use this for even finer level matching between your P331 settings and your bypassed signal, or for getting that little bit of extra level out of your analog chain before clipping your A/D.

When the GAIN knob is in its "zero" position (all the way down to the left) the resolution switch will add 0.25 or 0.5dB of gain when in BOOST mode. Once the knob is moved from the zero position the resolution switch becomes subtractive. So, for instance if one more 1dB click is going to be too much, you can "back off" 0.25 or 0.5dB.

## P331 TUBE LOADING AMPLIFIER IN USE

There's really no "right" or "wrong" way to use the P331. We believe in experimentation and that trusting your ears will guide you to the settings that sound "right" to you. With that said, the following may be a helpful guide to getting started and becoming accustomed to the P331's controls.

### STARTING POINT

The below settings are calibrated to provide unity gain at the output. It's a good starting point.

When processing stereo sources, we suggest ensuring your settings on the P331 are matched on the Left and Right channels.

Begin with the unit in BYPASS (OUT) with the LIFT, XFORMER and GAIN sections in their OUT (bypassed) position and the LOADING knob set all the way down (to the left) in its first position.

In the MODE section, set the auto-pad to PRE by ensuring the GREEN LED is illuminated. If the LED is any color other than GREEN, flip the momentary toggle all the way right as many times as necessary to get to GREEN, then

set the toggle to the CLEAN position.

## **LOADING**

Now that you have a starting point it's time to start experimenting with how the LOADING circuit will affect the audio source. Start clicking through settings on your LOADING knob. You'll notice little to no level gain or loss as you run through different settings. This is due to the auto padding which is working in the background before the signal hits the tube (PRE). Even though you are affecting internal tube gain, you are not hearing drastic changes in level. This helps when using your main BYPASS to A/B between the processed and unprocessed signal without being influenced by drastic level changes.

Try changing the MODE from CLEAN to BLOOM and experiment some more with the LOADING knob.

Now, instead of manipulating feedback to affect internal tube gain, you're manipulating plate loading to affect internal tube gain. Again, all being automatically padded behind the scenes to keep levels fairly matched.

Frequently use your main bypass switches to A/B between the processed and unprocessed audio. Now try flipping your MODE switch to the right to change from PRE (GREEN) to POST (ORANGE). The auto-padding is now occurring after the tube as opposed to before the tube. Running through the same settings you used in PRE now take on a slightly different vibe...and driving the input with louder or quieter signals adds additional possibilities.

## **OPEN UP WIDE**

When you switch to OPEN (BLUE) you're completely disabling the auto padding. If your LOADING control is at any setting other than zero (all the way to the left) when engaging OPEN, the unit will go into auto-cut mode. This ensures you will not experience an unexpected jump in output level if your LOADING is set high when you engage OPEN.

When in auto-cut the BLUE LED will blink. You will need to turn the LOADING control all the way down to Zero position to engage OPEN and disable auto-cut.

Since in OPEN mode auto-padding is disengaged, the LOADING knob turns into a tube gain control. As you turn up the LOADING knob your level will increase with each switch position. Using your GAIN control in CUT mode to manually pad the signal functions like a master volume on a guitar amp. Now you are in full control of the tube gain (LOADING knob)...and the padding (GAIN knob). And of course, you still have your CLEAN (feedback) or BLOOM (feed-forward) modes to switch between. Pretty sweet!

## **GETTING A LIFT**

Don't let the simplicity of this control fool you. What's going on behind the scenes took us a whole lot of experimentation to ensure the integrity of the original signal remains intact while gently lifting either the highs, lows or both the highs and lows of the source.

Like all the other features of the P331, the effect can be more or less subtle depending on the source and what settings you've chosen on the LOADING control. Sometimes it's just what's needed... sometimes the best position is OUT. It's your call.

## **TRANSFORMERS**

We allow the user to hit the optional output transformers in two different ways which changes their load and, in turn, provides additional sonic options. This control is also heavily dependent on the audio source it is being fed and the level of the signal. Experiment between the 1 and 2 settings to find the sweet spot or OUT for hard wire

bypass.

## OUTPUT GAIN

Although we've left the GAIN section for last, it's an integral part of using the P331 effectively. It's a fully-balanced, low-distortion output amplifier which allows you to take all that you are doing with the LOADING, LIFT and XFORMER circuits and boost or cut up to 11dB.

The GAIN knob gives you 11dB of BOOST or CUT in 1dB increments, while the RESOLUTION switch allows you to back-off 0.25dB or 0.5dB from whatever setting you're at on your GAIN control. The first position on the GAIN knob is 0dB. This allows you to select just 0.25dB or 0.5dB as a starting point if necessary by utilizing the RESOLUTION toggle. After that first position the resolution switch is "subtractive". For instance, if you are in BOOST and are adding 2dB on the GAIN rotary switch, by engaging the toggle switch to 0.25 you are REDUCING the level by 0.25dB.

The RESOLUTION switch really lets you fine tune your level-matching to A/B your processed vs unprocessed signal while experimenting with the other circuits in the P331 or to squeeze out every last bit of analog level at the end of your chain.

## WARRANTY

The P331 Tube Loading Amplifier is covered by a limited warranty against manufacturing defects in materials and/or workmanship for a period of five (5) years from the date of original purchase and only after proper registration which should be submitted by completing the on line registration form at:  
[www.whitestoneaudio.com/register](http://www.whitestoneaudio.com/register)

Whitestone Audio Instruments, LLC's sole obligation under this warranty is to provide, without charge, replacement parts and labor for the above referenced defects. Vacuum tubes and other consumables such as LEDs are not covered under these terms. Vacuum tubes and LEDs are covered for a period of six (6) months with proper registration.

This warranty does not cover damage due to misuse or abuse, modification, accidental damage or negligence. The warranty is also void if the P331 is repaired or altered by anyone not authorized, in writing, by Whitestone Audio Instruments, LLC.

If it is determined the P331 is eligible for warranty repair, a return authorization must be obtained from Whitestone Audio Instruments, LLC prior to shipment. Please don't ship equipment back to us without first obtaining this authorization. It's simply for organizational reasons and will expedite your warranty claim. Please return the unit in its original packaging. Make sure to not discard the P331's carton and custom foam insert after purchase. These cartons were specifically designed to protect the P331 during shipping. If the unit is not returned in original packaging, owner will be charged for new factory packaging. Include a note in the box that includes the owner's name, address, telephone number, email address as well as a description of the issue to be repaired. The owner pays for shipping the unit to the address provided with the return authorization and we suggest the shipment be insured for the P331's full value. Whitestone Audio Instruments will not be held liable for damage during shipping. After repair, the unit will be shipped to the customer prepaid and insured. Whitestone Audio Instruments, LLC will not pay for express or overnight shipping nor for shipments to locations outside the USA.

Whitestone Audio Instruments, LLC is in no way responsible for indirect, incidental or consequential damages arising from the use or failure of this product, including injury to persons or property. Any and all warranties of merchantability and fitness implied by law are limited to the duration of this warranty. This limited warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

All specifications are subject to change without notice.

Statements in this manual regarding the suitability of the P331 for certain types of applications are based on Whitestone Audio Instruments, LLC's knowledge of typical requirements that are often placed on pro audio products in generic applications. Such statements are not binding statements about the suitability of the P331 for a particular application. It is the customer's responsibility to validate that the P331 Tube Loading Amplifier is suitable for use in a particular application. Parameters provided in this manual, data sheets and/or specifications may vary in different applications and on different source material. Performance may vary over time.

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## Documents / Resources



[Whitestone P331 Tube Loading Amplifier](#) [pdf] Owner's Manual

P331, P331 Tube Loading Amplifier, Tube Loading Amplifier, Loading Amplifier, Amplifier

## References

- [Whitestone Audio Instruments, USA - Whitestone Audio Instruments, USA](#)
- [Registration - Whitestone Audio Instruments, USA](#)
- [User Manual](#)