



MODEL ZSTAGE

Stand-alone tube gain stage

OVERVIEW:

The ZSTAGE is a tube gain stage utilizing a dual triode (12AU7). Think of it as a purist line level preamp with gain. Gain is the ability to amplify a signal. We call it a "gain stage" because it is often used in combination with a DAC or CD player as an additional "stage" in your signal path.

A QUICK UNDERSTANDING OF GAIN:

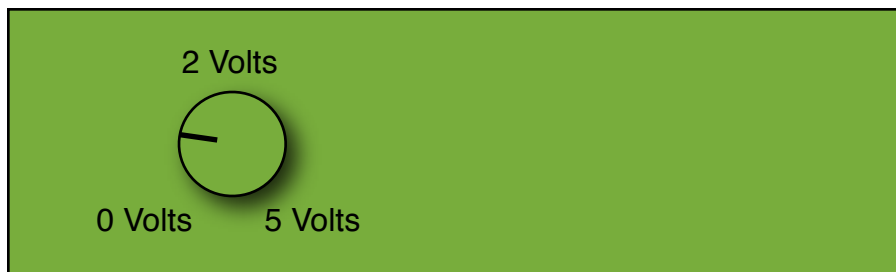
Most amplifiers will come to full power with about 1 volt of signal feeding their inputs. Interestingly enough, the industry standard output voltage from your CD player or DAC is closer to 2 volts. That means your source likely has almost twice as much signal as your amplifier can use. So in reality, when you install a preamp between your source and amplifier, it's main job is attenuation. In fact most preamps do not need or have any gain. They simply offer a way to turn the volume up and down. Most amplifiers do not have a volume (or gain) control on them, which is unfortunate if not deliberate to be able to sell you a preamp to go with it. If amplifiers had gain controls you would not need a preamp.

WHEN NOT TO USE GAIN:

If you have an amplifier with the typical input sensitivity of 1 volt or less, adding gain will make it nearly unusable as the volume control just barely turned on would cause the amp to get too loud too fast. If the amplifier has a gain control, it can be turned down making it possible to use a gain stage or preamp with gain if so desired.

WHEN TO USE GAIN:

If your amplifier has a lower input sensitivity - meaning it needs over 1 volt or more to come to full power. Some tube amplifiers can actually require as much as 5 volts to come to full power, although rare.



In the illustration to left, the gain control on the ZSTAGE is shown. The ZSTAGE has adjustable gain from 0 ~ 5 volts or more.

ZSTAGE HAS BOTH

Because the ZSTAGE has a variable output level, the gain can be adjusted to match any amplifier or pre-amplifier that it might be connected to, even cases where the amplifier is high power and has no gain control on it, the ZSTAGE will work well.

BUFFER STAGES

The ZSTAGE differs from a buffer stage. Buffer stages like our ZBOX, do not have any gain. When turned all the way up, a buffer achieves just below unity gain. That means that if the voltage going into the buffer from your CD player is 2 volts, the most you'll get out of it is around 1.8 volts. Buffers typically relax and balance the sound so it's typically warmer, smoother or less aggressive. A buffer stage will typically have a lower output impedance than a gain stage making it better suited to driving long cable runs without signal loss.

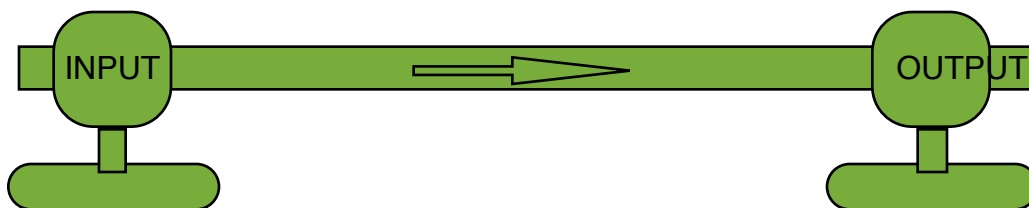
THE MAGIC OF GAIN

By now if you don't own one of the rare amplifiers that requires more than 2 volts to come to full power, you're probably wondering what possible advantages could there be to using a ZSTAGE?

Gain = Dynamics. The more dynamic your music is, the more real it will sound. Adding a ZSTAGE to your source will increase its dynamics and overall presence. In fact the difference can be such that the sound of your source will improve so much your thoughts about upgrading it will melt away. A customer recently purchased a new CD player of considerable cost and reputation to replace his existing player. The new player was better in every way and justified its much higher price. Then the player broke and the customer was forced to go back to his old player. Sadness... then he remembered he had a ZSTAGE in a different system, and placed it between his old CD player and his preamp hoping it would make it sound better. In fact it did, so much so that he could tell no difference between this combination and the new player he had. An example of how gain could save you a couple thousand dollars!

RIDING THE GAIN

A term we came up with because of the active nature of the adjustment process that can take place when you use a ZSTAGE in conjunction with an preamp OR amplifier fitted with a gain control.



Riding the gain happens when you have two controls. One at the source and one at the amp or preamp. Think of it like water pressure. You have a pipe with a valve at the input end and another valve at the output end. The valves represent the gain controls and the pipe represents the signal path between the two gain controls.

By turning up the input valve and turning the output valve down we create pressure inside the pipe. By turning down (closing) the input valve and turning up (opening) the output valve we reduce pressure inside the pipe. So if you took a garden hose and turned on the faucet you would have lots of water coming out the end, but it wouldn't be able to spray anything until you put a nozzle on the end. The nozzle acts like a valve to restrict the output causing the pressure in the hose to increase. PRESSURE in this metaphor is the same thing as DYNAMICS in your stereo system.

FREQUENCY BALANCE

By having a gain control at the source and a second one at the amp (or preamp) it is possible to manipulate the dynamics of your music and its overall frequency balance. For example, if the music sounds thin you can increase the "pressure" by turning down the gain control on the amplifier (or preamp) and then raising the gain control at the source. This will add noticeable weight to the music and mellow out the top end. On the other side, if the music is sounding boomy or thick, you can do the opposite - turn up the gain on the amp and reduce the gain at the source. The boominess will go away.

INSTALLING THE ZSTAGE

The ZSTAGE has only a single pair of inputs and a single pair of outputs so installation is easy.



The pairs run vertical. Each jack is banded with a colored stripe indicating left or right. The red bands mean right channel while the black bands mean left channel.

The outside pair of jacks (left pair in the photo) are the OUTPUT jacks that plug into your amplifier or preamp. The inside pair of jacks right next to them are the INPUT jacks that plug into your source (CD player or DAC as just two examples).

The fused power cord connector shown on the right above, contains a 2 amp fuse. There is no power switch. The ZSTAGE is designed to be left on 24 hours a day. The lower voltages of the ZSTAGE ensure the tube will last for several years. The power consumption of this device is less than a 15 watt light bulb.

When hooking up your ZSTAGE, be sure the volume control on the front of the ZSTAGE is turned all the way down before you plug it in.

USING YOUR ZSTAGE

Once you have it hooked up, simply adjust the volume by ear to the desired level. Approximately 1/2 way up is “unity” meaning it is neither adding or subtracting gain. Experiment with what sounds best.

If you have no preamp, and your amplifier has no gain control, you can use the volume control on the ZSTAGE to control the volume of your source, not unlike a simple preamp.

If you have no preamp and your amplifier does have a gain control, refer to the “Riding the Gain” section of this manual. You’ll find you can use either the gain on the amplifier or the volume control on the ZSTAGE to control the volume of your system, or both. Experiment with what sounds better.

The primary application for a ZSTAGE is to improve the fidelity of a DAC or CD player. It can however be used with any line level source, such as a tuner, tape player, phono stage, DVD player, computer, IPOD, etc.

TUBES

The ZSTAGE is a single-ended triode (SET) tube stage running in class A with no feedback and very few parts in the signal path. It's transparency is as good as you can get making the unit suitable in even the most expensive systems. It uses a single tube (dual triode) to serve both channels. This was done to make sure the signature of the left and right channels always match. The stock tube in the ZSTAGE is a 12AU7 (5963) but it is acceptable to also use the 12AT7. The 12AT7 has a bit more gain than the 12AU7, but more importantly it will sound different. My advise is to stick with the 12AU7 if you want the smoothest and or warmest sound. That said, if you wish to experiment with different tubes to see how it changes the sound, you should first determine if you like a 12AU7 or 12AT7 better in your ZSTAGE. Then find yourself a hand full of different brands of the favored tube and try each of them.

BIAS SWITCH

You'll notice a small switch on the front of your ZSTAGE. This is a bias switch. It's function is to alter the voltages inside the tube so that you can change the way it sounds. You have 2 choices, either A or B. One way will sound more dynamic while the other position with sound more laid back. You can only decide which way to leave the switch by listening to it both ways and choosing what you like best.

NOTE: This switch will create a "pop" every time it's used if your amplifier is turned on. This is not a problem with Decware amplifiers but it could be a serious problem with other brand amplifiers, especially amps with a lot of power because the pop could be enough to damage your loudspeakers should the amp be turned all the way up.

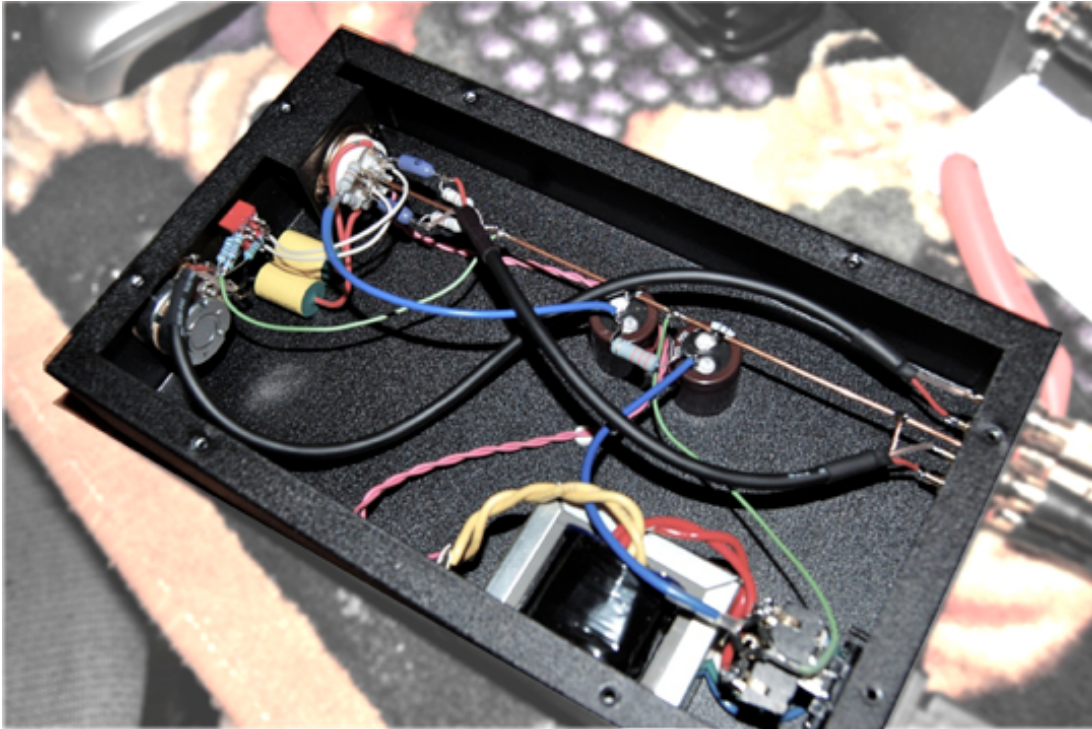
RULE: Always turn the volume on the ZSTAGE all the way DOWN before changing the position of the switch. Then you can raise the volume control back to where it was. Doing this will eliminate any sounds or pops regardless of the amplifiers you use.

INTERNALS

The ZSTAGE has no user serviceable parts on the inside. The user should never remove the bottom cover. The tube can be changed externally from the front. Lethal voltages are used inside the ZSTAGE.

The amazing transparency of this product can be attributed to not only it's circuit design, but by it's point to point layout without circuit boards. The ground buss runs directly from the input jacks to the tube. It is solid copper and runs in a perfectly straight line. (Can't get any shorter or cleaner than that) There is only 1 capacitor and 1 resistor in the signal path on each channel. The entire audio circuit is built on the back of the tube socket in such a way that each part is soldered to the next without using additional wire. The cables from the input and output jacks are top quality Belden. Remaining wire used is silver plated copper in Teflon. The ZSTAGE is already using top grade audiophile parts (resistors, film & foil capacitors, wire, solder, switches) so the "upgrading" is already done. The fidelity of the ZSTAGE will be solely determined by the tube you use and the interconnect cables entering and exiting the unit.

The chassis is a heavy grade steel to keep vibrations to a minimum. The finish is a baked on textured powder coat in black. Coated inside and out, the unit is ensured of being scratch free and rust free 30 years from now. This ensures not only continued enjoyment but higher resale values should you ever sell it.



Internal view of ZSTAGE

PLACEMENT and HEAT

The tube of the ZSTAGE never gets too hot to touch due to its reduced voltages. Same goes the chassis, it never gets more than warm so placement of this device is unrestricted. Just keep it dry.

HUM

The ZSTAGE with supplied 5963 tube is very quiet. The Noise and Hum ranges from 0.00 millivolts with the volume set to minimum to 1.7 millivolts with the volume turned to max. Even on the most sensitive systems, you should hear no hum. If you DO hear excessive hum, read the paper on the web site titled "Troubleshooting hum problems" and it will guide you through the process of finding the ground loop that is causing your hum problem.

WARRANTY

The ZSTAGE comes with a lifetime warranty to the original owner, covering manufacturers defects for parts and labor during that time. The tube (included) comes with a 90 day replacement guarantee. Note: If a tube goes bad it is usually within the first few hours or days of use - indicating that it was miss-handled during shipping. Should this happen return it to us for a warranty replacement.