



CSP3

Reference Vacuum Tube Preamplifier

 **DECWARE**

lightning flash with arrowhead, within an equilateral triangle, is intended to alert the user to the presence of uninstalled "dangerous voltage" within the product's enclosure that may be of risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

AVIS RISQUÉ DE CHOC ELECTRIC-NE PASOVRIR.

WARNING- TO REDUCE RISK OF FIRE OR ELECTRICAL SHOCK, DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE.

NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED PERSONNEL.

To prevent the risk of electrical shock, do not remove cover or bottom. No user serviceable parts inside.

IMPORTANT SAFETY INSTRUCTIONS!

PLEASE READ THESE BEFORE OPERATING THIS EQUIPMENT.

1. Read and Follow these instructions.
2. Do not plug your preamplifier in or attempt to turn it on until you have read and followed the steps in this complete manual.
3. **Never leave this preamplifier powered ON while unattended or at night when sleeping.**
4. Do not use this preamplifier near water or in damp locations.
5. Do not place this preamplifier near any heat sources such as radiators, heat registers, stoves, or directly above other amplifiers that produce heat.
6. Do not defeat the safety of the three-prong power cord by attempting to lift the ground. If you only have two-prong outlets in your home, have a licensed electrician install a grounded outlet near the preamplifier.
7. Protect the removable power cord from being walked on or pinched at either end.
8. Do not attempt to move this preamplifier until after it has been turned off and cooled down to room temperature.
9. Unplug the preamplifier during lightning storms or when unused for long periods of time.
10. Refer all service to Decware or a Decware authorized service tech. Do not attempt to fix internal problems. There are no user serviceable parts inside.
11. **WARNING HIGH VOLTAGES PRESENT** - This preamplifier stores up to 500 volts in the capacitors. Do not open the amplifier under any conditions.
12. Never touch a vacuum tube while it is operating. Some can reach temperatures near 400 degrees F.
13. **ALWAYS** place preamplifier on a solid sturdy clean and level surface that can support its weight.

Thank You

By purchasing this preamplifier you are helping to preserve the art of finely crafted audio products with absolute world class reference fidelity.

Please Take a Moment

The serial number and date of your amplifier are recorded on the bottom. Take a moment to write them down here so you don't have to move your amplifier once it is installed.

Serial Number: _____

Date (Month/Year): _____

Model Number: _____

Technical Assistance

You can get help by calling us directly or you by e-mail.

If you have any issues, check the web site's contact page for up to date e-mail addresses and phone hours.

We also have a strong online support forum that is very active. This can be a handy way of getting help during off hours or weekends when our office is closed.

DECWARE/High Fidelity Engineering

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Unpacking

Your Preamp should be carefully inspected upon receipt for any damages that may have occurred in shipping. If you detect any issues please contact us right away.

Getting Started

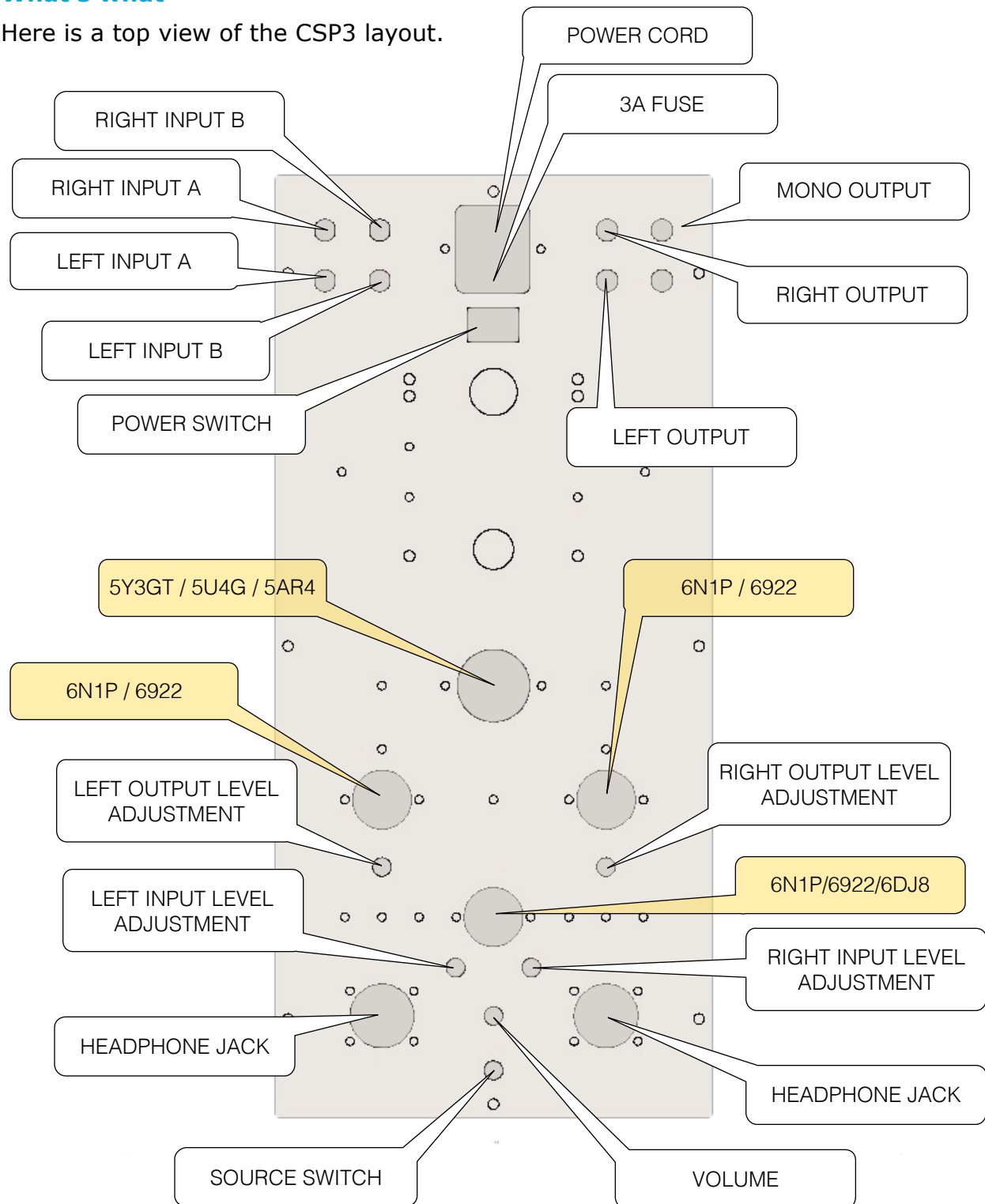
If you have taken delivery of your preamp during cold weather please allow it to come to room temperature before you plug it in and try to use it.

You will need three pairs of high-quality interconnects and a power cord as well as the supplied tubes.

On the following page you will see diagram of your preamp. Please familiarize yourself with it as well as refer back to it frequently as you become familiar with how this preamp operates.

What's what

Here is a top view of the CSP3 layout.



Connections

The cables and jacks should be kept clean for optimal fidelity. The easiest way to do this is to clean the male pins on your interconnects and headphone cables with contact cleaner or 99% pure alcohol BEFORE you plug them into the preamp.

Doing this will keep the insides of the jacks clean. A serious audiophile will do this every few times the cables are removed and installed.

Tube pins are equally important and should be cleaned every time a tube is installed. Once again, this will keep the tube sockets clean which is critical for maintaining top fidelity. Tube pins can be cleaned with 99% pure alcohol or a pencil eraser.

In addition to keeping tube pins clean, the smaller 9 pin tubes have thinner pins that must be kept straight. If you notice the pins are bent they must be straightened prior to inserting the tube into the socket. A simple way to accomplish this is to have a tube pin straightener available from Decware.



tube pin straightening tool from Decware

Input Connections

Your CSP3 can accommodate two line-level sources such as a CD player and a Phono Stage for listening to LPs.

The switch to select inputs is on the front the preamp near the volume control. If you require more than two sources we make a high-quality silver switch box that can be used to extend the total number of sources to five.



Your CSP3 contains a silver input selector switch and the switch box shown above is also using silver switching and silver / Teflon internal wiring. This component is called the ZSB and available on the Decware web site.

Connecting Subwoofers

The CSP3 can be built with your choice of two output jack configurations. You can have two pair of stereo jacks OR one pair of stereo jacks and one mono jack.

The mono jack can be used to drive a center-speaker amplifier in a three-channel setup, or a single channel amplifier in a mono set up; most commonly the jack can be used to drive a powered subwoofer.

Installing Tubes

There is nothing particularly special about installing the tubes other than making sure they are the correct ones! In the case of this preamp, we ship it with (3) 6N1P tubes which are all 9-pin tubes. It makes no difference which of the three 9-pin sockets you put these tubes in.

The large octal (8-pin) tube is the rectifier tube and can only fit in the larger socket and only rotated a certain way so that the plastic dowel key in the center of the tube socket lines up.

Make sure tubes are OFF and COOL before you remove or install them. Contrary to popular misinformation, you can touch the tubes without having to clean your finger oil from the glass. Your finger oil will have no effect on the operation or the life of the tubes.

Tube Matching

Matching the tubes is not required in the CSP3 preamp since the channels can be individually adjusted; however it is nice to have the left- and right-rear 9 pin tubes matched when possible so that you do not have to correct for channel imbalances that might otherwise result.

The input tube at the front of the preamp actually serves both channels; meaning the left triode section of the tube does the left channel and the right side does the right channel. Again, while not required, it is nice to have this tube with matched sections so the channel balance remains true without adjustment.

Tube Substitutions

Rectifier Tube - Used to convert high voltage AC to high voltage DC. The factory supplied rectifier is either a 5U4 or a variation of it, such as the 274B from Valve Art.

The CSP3 uses a 47uf 500V capacitor in the first section of its power supply, so many 1940s rectifiers and remakes are not compatible since they want to see less than 10uf 500V capacitors. When buying fancy rectifier tubes always be sure they will be compatible with 47uf 500V capacitors.

The recommended rectifier tubes for this preamp are: 5U4G, 5AR4, 5Y3GT

Tube Substitutions cont'd.

The front 9 pin tube can be substituted with the following: 6N1P, 6N5P, 6N23P, 6DJ8, 7DJ8, 6922, 6N11. Of all these tubes, the 6N1P is the warmest. The 6N5P sounds just like it but has better focus and a touch less gain. The rest vary from brand to brand.

The other two 9 pin tubes can be substituted with 6N1P, 6N5P, 6922, 6N11

Biassing Your Tubes

There is no biasing to adjust on the CSP3 preamp. All the tubes are cathode biased which makes them naturally self adjusting and always in the optimal range.

Tube Life

If the recommended 9 pin tubes are used the tube life will be whatever the advertised lifespan is on the tube data sheet. In most cases this will be around 6000 hours for a new tube.

Rectifier tubes are the first line of defense against power spikes and can fail as a result of this for what would seem like no apparent reason. If rectifiers are used that are not the recommended 5U4G, 5AR4, 5Y3GT then there is no guarantee how long they will last. Using the approved rectifiers it is possible for one to last for up to four or five years before it starts getting tired.

If a rectifier tube sparks internally when you first turn on the preamp, it is a sign that the tube may fail in the near future when the preamp is first turned on.

Always have a good working spare rectifier tube on hand at all times.

Operation and Setup

To operate your CSP3, install the tubes, hook up the output jacks to the amplifier. Once you are sure the amplifier and preamp are securely connected together with a high quality interconnect cable between 1 and 5 meters in length you may plug both units into the wall outlet.

Before you turn either piece on make sure that all of the controls on the CSP3 are turned all the way down.

Turn on the CSP3 and let it warm up for one minute. Double check that all the controls are down all the way, including the volume and that the interconnect cables are securely installed into the output jacks of the CSP3 and the input jacks of your amplifier.

Turn on the amplifier. The amplifier should come on and if has a gain control on it, turn it up to the half way point. Your system is now on and at idle. Any noise or hum that you hear is your system reference. Make a note of it so that later when we connect our sources we can see if they added any noise or hum.

It is now time to connect your first source component to one of the input pairs on the CSP3. You can do this while the CSP3 and your amplifier are on and at idle, but be sure you haven't turned any of the controls on the CSP3 up yet.

If you didn't hear any hum or noise increase when you connected your first source that means that A) your cables are probably good and B) there is no ground loop between the components.

No add your second source if you have one and again listen for any increase in noise or hum. If with either source you DO notice an increase in noise or hum then it comes from cables or small ground loops between the components or both. The key here: is the noise or hum acceptable? For example if you have to put your face up to the loudspeaker to hear it, it's acceptable. If however you can hear it from the listening chair it is not acceptable and should be corrected before going any further.

Once everything is connected and warmed up and you are happy that there are no excessive amounts of noise or hum, you can set the controls on the CSP3 to match your amplifier's requirements:

- 1) turn up the input level controls all the way (clockwise). These are only adjusted during headphone use and only with headphones that get too loud.
- 2) turn on your source and get some music playing.
- 3) turn up the main volume control on the CSP3 to half way.
- 4) slowly turn the output level controls up until you hear music playing at a normal listening volume.
- 5) your preamp is now adjusted properly for your amplifier.
- 6) further experimentation can be made by adjusting the gain control on the amplifier if it has one relative to the output level settings on the CSP3.

Clipping

Clipping is another term for distortion during playback. The CSP3 has up to 30 volts of output with an industry standard 2 volt input signal without distortion and can be adjusted to handle any input voltage via its variable input controls. Since most amplifiers are set up to play at their full rated power with as little as 1/2 to 2 volts, it would be virtually impossible to clip the line level outputs of the preamp.

Headphones

Believe it or not the CSP3 was originally designed as a reference grade OTL headphone amplifier. It wasn't until later that we decided to make it also work as a preamp and since no additional circuitry was required it was the logical thing to do.

You can use any dynamic headphone between 32 and 600 ohms with your CSP3. In fact there are several of the more efficient planar headphones that will also work reasonably well.

If your headphones get too loud too fast, you can turn down the input level controls.

The CSP3 can be built with either a pair of 1/4 inch headphone jacks, or a pair of 4 pin XLR jacks, or one of each. Also it can be built with dual 3 pin XLR jacks. Your headphone cables are what determine what kind of jacks you need. Many people will configure it with one 1/4 inch headphone jack and one 4 pin XLR headphone jack which covers the most popular headphone cables.

Burn-in

When your CSP3 is new it will require about 200 hours of use to reach what we term "burned in" state which is to say a state where the sound is pretty much where it's going to be from then on out. During the 200 hour burn in period the preamp and the tubes will season and you will hear the sound continue to improve. The biggest differences happen in the first 20 hours.

Design

The CSP3 has a somewhat interesting design behind it. It is a dual triode driving a pair of dual triodes where there is one for each channel. The pair that is being driven is wired so each triode is in series (SRPP) giving it both massive output levels but also low output impedance to drive long cable runs.

Design cont'd.

There are precious few parts in the circuit and it is wired point to point with no circuit boards but even that's not what sets this preamp so far apart from similar circuits. The CSP3 features a very simple single node power supply that feeds all three tubes from the same point. The power transformer is rated for a 170 milliamp load which is what you would see with a 40 watt power amplifier, yet it only draws 10 milliamps! That makes the power supply of the CSP3 literally 17 times larger than required and that much more expensive.

The reason for this is multi-pronged. A) the power supply has bottomless current and over twice the voltage it needs to operate with zero sag and therefore requires zero regulation. B) it will last virtually forever which makes it easy to carry our lifetime warranty.

As a headphone amp or a line-stage, this artifact-free liquidity is well appreciated and solely the result of this power supply.

For line stage use we made the output level of each channel adjustable relative to the master volume control to make it compatible with literally any size or type of audio amplifier.

Besides being able to adjust the gain structure with these output level controls to effect the voicing, you can also do a great deal of voicing with tubes.

Voicing

The CSP3 can be voiced through gain structuring and through tube rolling. To voice by gain structuring you simply experiment with the relative settings between the volume control and the output level controls. For example, having the volume control higher in it's range and the output level controls set lower will sound one way while doing the opposite will sound another way. If your amplifier has a gain control, the same can be done between the output controls of the CSP3 and the gain control of the amplifier.

To voice with tubes, we recommend starting with rectifiers. Get yourself three or four different compatible rectifiers to try and settle on a favorite. After the rectifier tube you can then experiment with different input tubes, which is the single 9 pin tube in the front. There remaining two 9 pin tubes are almost always best kept stock (6N1P).

Focusing on the input tube location, you will find the 6N1P warmer, the 6922 less warm but more focused and the 6DJ8 to be more detailed in the top end and lighter in the bass. Of course there are many more tubes than this to try, but these are the three basic starting points.

For headphone users, voicing can mean the difference between liking and disliking a pair of headphones.

Maintenance

There is no real maintenance on the CSP3 other than to keep it and the jacks clean. The best tool for dusting your CSP3 is a 2 inch paint brush. If you have to really clean it, remove the tubes and spray some windex (window cleaner) on a cloth rag and wipe the surfaces clean. When dry, clean and re-install the tubes.

Tubes should be replaced every couple years on average, but it is dependent upon use.

Since tubes wear out slowly it is hard to hear when to change them. The trick to knowing their condition is simple; Keep a complete set of new tubes on hand and every 6 months install them to see if the sound improves. If it does its probably time for new tubes. If the sound doesn't improve then put the new tubes back in the boxes and try again in 6 months.

You can think tube replacement for your CSP3 in 3 levels:

- 1) The first tube to replace is the rectifier. If it's getting tired a new one will sound cleaner and more robust.
- 2) The second level is the input tube in front. Replace it with another of the same type and see if the sound gets better.
- 3) The third and final level is the output tubes which are the remaining two 9-pin tubes. These are usually purchased and replaced in matched pairs.

It is possible for only one of the three levels to require new tubes, or all three levels.

NOTE: the level controls and the volume controls are designed to be used, so it is good to periodically turn them throughout their full range before the preamp is turned on just to work the dust out of them. This is especially true if the preamp has sat for any length of time (months) without use.

Specifications

Weight	16 lbs
Dimensions	8.5" H x 7.25" W x 14.75" D
Circuit	Triode Class A OTL
Input Voltage	Adjustable
Noise/Hum	-80dB
Input Impedance	100k Ohms
Output Impedance	<600 Ohms
Feedback	None
Rectification	Tube 5U4
Signal Tubes	6N1P / 6922
Biasing	Cathode Bias - no adjustments needed
Resistors	1% metal film and carbon composition
Signal Caps	Film and Foil
Filter caps	F&T 500V 47uf x 2
AC Cord	Fused IEC 3A fuse and removable cord included
Consumption	65 watts
Input jacks	RCA
Output jacks	RCA
Headphone jacks	dual 1/4", 4 pin XLR or 3 pin XLR
Warranty	lifetime to original owner, 90 days on tubes

Service

For service please contact us by phone or by email. You can find both on the contact form of our web site, www.decware.com

We can help you troubleshoot your system and help you determine what is causing the issue that you're having. Everyone can save themselves a lot of trouble by having a spare set of known good replacement tubes on hand. Most problems are tube related. For example, noise or hum problems could be a tube. Channel balance issues are likely a tube. Sound quality issues are likely a tube.