

# Owner's Manual

Model

**SE84UFO**

Stereo Power Amplifier

 **DECWARE**

## Preface

Please take time to carefully read and understand the following instructions before you install or attempt to operate this equipment.

## Packaging

Save the packaging that came with this product. You will need it if you return the amp on the 30 day trial, or if at some point in the future you need to send it back to Decware for service or upgrades.

## WARNINGS

1. Do not touch hot tubes. Keep away from children.
2. Keep Dry. Avoid rain or moisture.
3. Do not place liquids or live plants near or above this product.
4. This unit contains voltage which can cause serious injury or death. Do not operate with bottom panel removed, or broken tubes.
5. Use only supplied power cord or approved after market power cords and make sure they are plugged into a grounded outlet that is up to present day electrical code.
6. Always maintain quick access to the power cord outlet so that the unit can be unplugged for emergency power disconnect.
7. Always replace fuses with the same type and rating specified on the product sticker. Defeating the fuse or installing a fuse that is too large will void the lifetime warranty.
8. Only install or replace tubes when the unit is off and the tubes are cool.
9. When removing tubes be careful not to touch bare metal tube pins until the tube has been completely removed. High voltages can linger internally after the product is turned off.
10. Do not operate this product without tubes installed.
11. Make sure that you have the correct tubes for your product before you install them.
12. Make sure you install the tubes in the correct locations.
13. Do not operate product when you are not at home.
14. Do not operate product with worn out tubes as tubes may create an electrical short when they finally fail which can cause internal damage to the product.

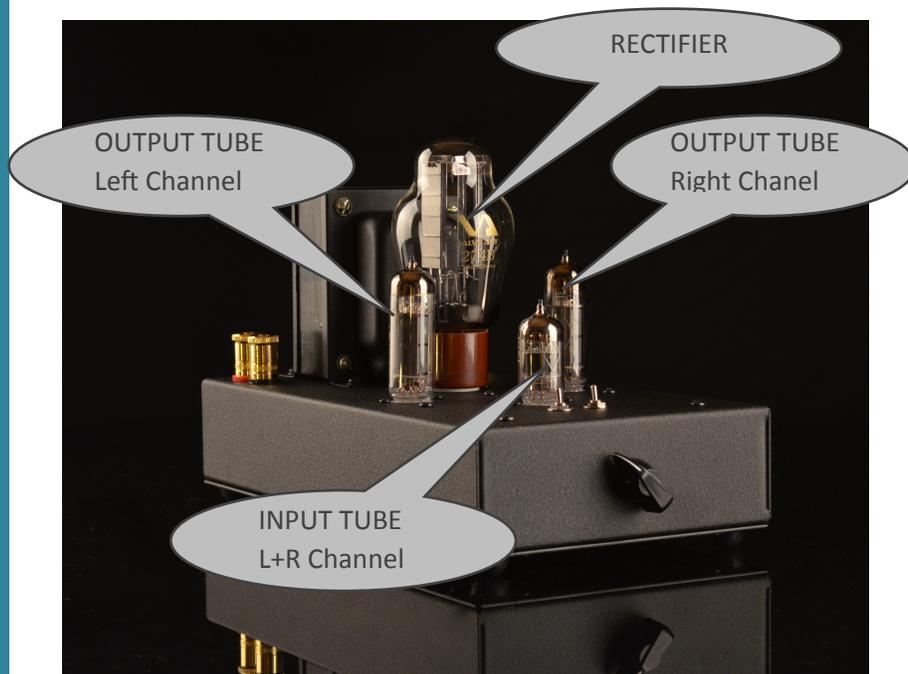
## Tube Types

Your product uses the following tubes:

QTY	NUMBERS	PINS	TYPE
1	5U4 / 274	8	RECTIFIER
1	6N1P /6922	9	INPUT TUBE
2	6P15P-EB	9	MATCHED OUTPUT TUBES

Reference grade replacement tubes, such as those that shipped with the product are available from Decware. Replace tubes every 3000 hours.

## TUBE LOCATIONS



Tubes should be carefully installed prior to hooking up your product. Tube sockets can seem unusually tight when the product is new, be sure to get the tubes worked down fully so that the base of the tube touches the tube socket.

## Installation

To insure normal product life this unit must be operated in an upright position. Adequate airflow and proper cooling can only occur if there is free flowing air around the unit. We recommend at least 2 inches of clearance on all sides and 6 inches above.

## HOOK-UP

### Speakers

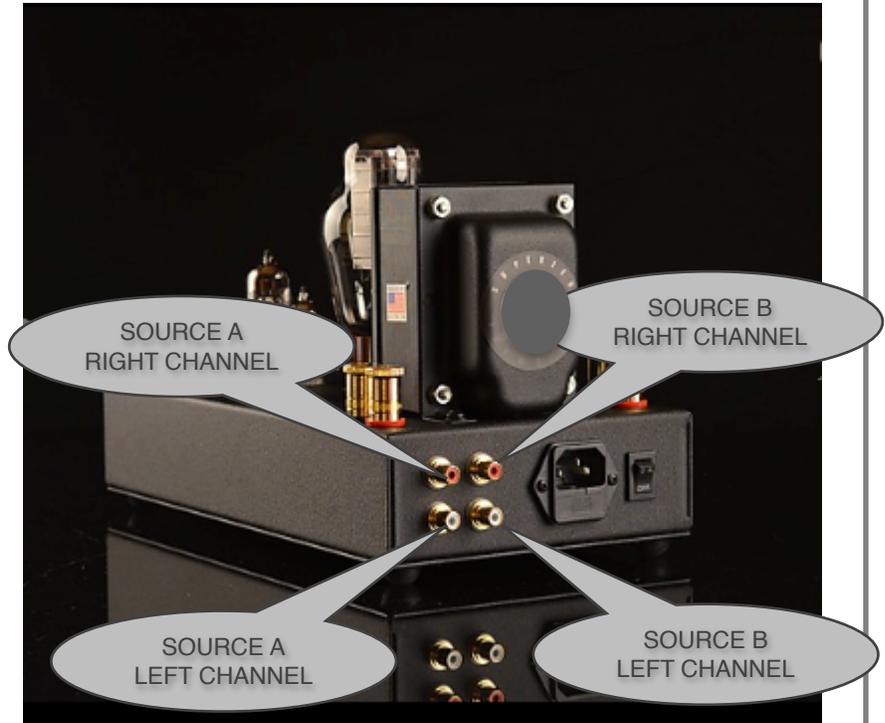


This amplifier can operate speakers as low as 2 ohms, and as high as 16 ohms and everything in-between. No harm can come to the amplifier if the speaker jacks are shorted together.

There is a HI / LO switch next to each pair of speaker jacks on the amplifier. This is used to match the amplifier to a given loudspeaker load. It is operated while music is playing and selected by ear for the best sound. The amplifier will work fine with the HI / LO switch in either position regardless of speaker load, however each setting will make your speaker sound different or perform differently. Choose the setting that you like the best and revisit the setting often to make sure you didn't just choose one position over the other because it sounded better with the particular recording you were listening to when you made the choice.

## HOOK-UP

### Sources



This amplifier has been designed in such a way that you may use it with or without a pre-amp. To that effect it has been equipped with both a volume control and a simple source selector to allow you to switch between two line level source components, such as a CD Player/DAC and anything else.

If using a preamp, connect the output of the preamp to one of the two sources on the amplifier and set the amplifier's volume control somewhere between 1/2 way up and full. Use the volume control on your preamp to adjust listening volumes.

This amplifier requires 2 volts to come to full power. 2 Volts is the average output signal level found in line level devices such as CD players and DACs. This means that you will have to turn the volume control nearly all the way up to make the amplifier clip (run out of power) which keeps the clipping "kind" and harmless to not only the amplifier but also the tubes and the speakers.

### Preamps

### Sensitivity

## HOOK-UP

### Power



Make sure power cord is fully inserted into power cord jack. A loose cord can cause reliability issues with the tubes and potentially the amplifier itself.

We recommend plugging your amp directly into a new hospital grade duplex outlet with a secure ground.

Consumer grade power conditioner's are not recommended as most of the noise they filter out of the power they inject into the air which is then re-absorbed by the glass tubes causing worse sound than if no conditioner was used. Exceptions are Isolation transformers such as the "Triplite" brand model ISO-500 or a power re-generator. Always try to avoid power strips or extension cords whenever possible as they can cause ground loops between your components resulting in hum.

We recommend the ISO-500 when power conditioning is desired or a simple alternative to cheap power strips is needed as each ISO-500 comes with 4 outlets

**NOTE: 220 ~ 240 VAC amplifiers should use a 1.6 AMP fuse.**

## CONTROLS



### Volume

The volume control should be all the way down (counter-clockwise) whenever the amplifier is first turned on and then slowly raised to the desired listening level.

There are two small toggle switches located at the front of the amplifier just in front of the input tube. The left switch selects from source A and source B. The right switch adjusts the amount of input tube bias.

### Bias Switch

Tube bias simply means how much current the tube is allowed to use. In this amplifier, the 6N1P input tube and compatible alternate such as 6922, 6DJ8, 7DJ8, 6N23P, 6H1N can all be operated at more than one bias point resulting in different sounds from each. There is no right or wrong setting for any of the above mentioned tubes. Simply listen to the amp with both settings and select the best one to your ears.

NOTE: When operating the bias switch while the amplifier is on, you will hear a “pop” sound come from your speakers. This is normal and harmless to your speakers, so it is an accepted practice. The volume control will have no effect on the loudness of the “pop” when you operate the bias switch.

## Tube Rolling

In addition to the above mentioned alternate input tubes that can be used in this amplifier, There are also some alternates for the remaining tubes.

Rectifier Tube Alternates: 5Y3GT, 5AR4

Output Tube Alternates: EL84/6BQ5

## Sequence of Operation

### ON

- 1) Turn the volume control on the amplifier all the way down.
- 2) Turn on the upstream components first, such as your source and preamp if you're using one.
- 3) Turn on the power amplifier and wait 60 seconds for it to warm up and then slowly raise the volume control.

### OFF

- 1) Turn the volume control on the amplifier all the way down.
- 2) Turn off the power switch.

## MAINTENANCE

### Cleaning

This product has no user serviceable parts inside, nor are there any internal parts that are prone to failure. The only maintenance this amplifier requires is occasional cleaning and regular tube changes.

To Clean the amp a cloth or paper towel can be used dampened with water or window cleaner such as "Windex".

To keep the amplifier clean we recommend purchasing a natural bristle paint brush and using it to keep the amplifier dusted. A 2 or 3 inch brush is ideal.

### Tubes

Tubes should be replaced BEFORE they fail. A tube loses its performance relative to the hours of use, and frequency of clipping. The best way to tell if your tubes need replaced when you don't know how many hours are on them, is to install a fresh set and see if the amplifier sounds any better, or stronger.

For example, the two 6P15P-EB output tubes can be replaced with a new set and then the amplifier can be listened to. If no substantial improvements are heard, the new tubes can be returned to their boxes and the test can be repeated again in 6 months or whenever there is doubt. The same can be done for the INPUT tube and the RECTIFIER tube.

Always have a fresh set tubes on hand at all times because you can never predict when a tube is going fail, become noisy, or simply stop sounding good. It is the nature of modern day tubes made in third world countries.

The only maintenance on the tubes themselves is to keep the pins straight and clean. A pencil eraser works well to clean the tube pins.

### Jacks

The visible parts of the Gold Input jacks should be cleaned with alcohol using a cotton swab as well as your interconnect cables, as connections full of finger oil and dirt do not sound good.

## SERVICE

Your amplifier comes with a lifetime warranty to the original owner which means for the lifetime of the company, or the owner whichever ends first. In the event that the company ends first, which is unlikely, you can have the peace of mind in knowing that these over-built products use 1950's technology with the simplest of circuits that any competent technician can easily fix. There are no solid state parts, large circuit boards, software, or anything like that inside to go bad, in fact the only replaceable parts are capacitors and resistors which are all too easy to replace.

In the event that your amplifier does need service please contact Decware so we can help you troubleshoot the amp by phone or make arrangements for the products return to Decware for inspection and repair.

## Warranty

The lifetime warranty covers defects in materials and workmanship under normal use and operating conditions.

Tubes have a separate 90 day replacement warranty.

SEND TO:           DECWARE / HIGH FIDELITY ENGINEERING  
75 S. Riverview Drive,  
East Peoria IL 61611 USA (309) 822 5255

You can also contact us through the web site: [www.decware.com](http://www.decware.com)

NOTE: Please include a current RA form with and returns, be it warranty or upgrades. The form is located in the SERVICE tab on the web site.

## Specifications

Power Output	2.3 Watts RMS @ 8 ohms
Frequency Response	20Hz ~ 80kHz
Speaker Range	2 ohms to 16 ohm nominal impedance
Input Impedance	100 kHz
Input Sensitivity	1.8 Volts
Power Consumption	65 Watts
Circuit Design	Single Ended Triode
Negative Feedback	None
THD	2.24% @ 1 watt 20-20kHz. / 0.14% 2nd H.
SNR	-79dB
HUM	-64dB
Tube Rectifier	(1) 5U4
Output Tubes	(2) EL84 or 6P15P-EV
Input Tube	(1) 6922 or 6N1P or 6DJ8 or 7DJ8 or 6H1N
Size Dimensions	8.0"H x 6.125" W x 12.0" D
Weight	17 lbs
Fused	5 x 20 mm 3 AMP/120V or 1.6 AMP/240V
Norm Temperature	Transformer < 139°F @ 80°F ambient room

## Troubleshooting

SYMPTOM	CAUSES	REMEDIES
Hum through speakers	Ground Loop	Plug power cord into a different outlet.  Install 2-pin adapter on power cord plug to float the ground.
	Intermittent ground or shield wire in interconnect cable	Replace interconnect cable.
	Noisy Input Tube	Replace Input Tube.
	Bad Rectifier Tube	Replace Rectifier Tube.
	Unshielded Interconnect used	Re-route cable away from power supplies and power cords or replace with shielded cable.
	Digital Light Dimmer's on same circuit	Turn off digital dimmers.
	WIFI bridge or router nearby	Locate farther away from audio components
Hum from amp itself	Chattering rectifier tube	Tap on tube to see if chattering stops and if so replace rectifier tube.
	Power transformer	Poor voltage or over voltage at the wall outlet can cause an increase in power transformer vibration, correct voltage.
		Relocate amp to middle of room to see if transformer hum reduces. If so, the shelf or rack the amp was in can be changed.

## Troubleshooting

SYMPTOM	CAUSES	REMEDIES
Popping or Spitting noise	Noisy tube	Replace noisy tube
	Wifi router or bridge nearby	Locate away from audio components
AC fuse blows	Line voltage surge	Replace fuse
	Rectifier Tube Arced on initial startup	If it continues, replace rectifier tube and fuse.
	Fuse is too small	Install correct amperage fuse. If amperage IS correct and fuse blows, use a SLOW BLO fuse of the same amperage.
One Channel stops working	No signal to that channel	Take the cable from the channel that works and put it into the channel that stopped working. If it starts working, the amp is fine, but you have either a bad cable or problem with your preamp or source component.
	Speaker cable came unhooked	Reinstall speaker cable.
	Output tube failed	Replace output tube.
Channel imbalance	Output tubes no longer match	Replace output tubes with a matched pair.
	Input tube sections no longer match	Replace input tube with a new input tube that has matched sections.
	Speaker HI/LO impedance switches are not set the same.	Adjust the HI/LO switches the same for each channel.

## Troubleshooting

SYMPTOM	CAUSES	REMEDIES
Amp won't turn on	Blown Fuse	Replace fuse
	Power cord is not pushed in all the way or intermittent	Check power cord, replace if necessary.
Tubes light up but no sound	Rectifier tube is bad even though it still lights up	Replace rectifier tube.
	Volume control is all the way down.	Increase volume control level
	The source switch is set to the wrong source	Adjust the switch to the other position.
	Your source is not playing	Start source
	Interconnect cables are unhooked	Reinstall interconnect cables.
	Incorrect tubes are installed	Install correct tube types
	tubes are installed in the wrong locations	Reinstall tube in the correct locations.
Sound is real weak	Source switch set to wrong source	Reduce volume and Adjust source switch.
Sound is getting weak	Tubes are past rated life of 3000 hours	Replace tubes.
Sound drops out on both channels and comes back on	Power cord is loose	Check power cord, replace if necessary.

## Design Notes

The Zen Triode Amplifier, model SE84UFO is the current incarnation of the 2 watt amplifier that started Decware in 1996. It set the benchmark extremely high and with 20 years of improvements it continues to haunt even the best sounding high dollar amplifiers made today.

The design is based on getting an audio circuit as simple as possible with respect to parts count and lay it out in such a way that eliminates circuit boards and as much connecting wire as possible. In this spirit an amplifier circuit consisting of only 1 capacitor and 2 resistors in the signal path was laid out in such a way that primarily only parts leads are used to connect to each other reducing the solder nodes dramatically. The entire tube amp is actually far simpler than even a single op-amp.

To maximize the potential transparency of this approach, proprietary wide bandwidth interleaved air-gapped single ended transformers are used to ensure no transparency is lost in the output transformer itself. Additionally, a triode circuit is used which is linear under a wide range of speaker loads so that it requires no fidelity robbing negative feedback.

To ensure 2 watts can drive difficult speaker loads the primary impedance ratio for the output stage is much higher than normal so that when a speaker's impedance starts to dip down, the point where many tube amps loose ground, the reflected impedance to the output tube plates also drop putting it more into the tubes happy zone creating a condition where the amp puts out more power instead of less.

The result of this thinking is that the amp can drive virtually any loudspeaker load with a good frequency balance and tight bass response. This even includes magnetic panel speakers and electrostatic loudspeakers. The only consideration with the amplifier is how loud it will play with the given efficiency of your loudspeakers.

Ideal loudspeakers for this amp are speakers rated in the mid to high 90's. Example, 94dB 1w/1m works well in even larger spaces.

(continued on next page)

## Design Notes Continued

It's important to understand that the resolution of this amplifier design is only possible with the quality of the build and skilled hand soldering needed to make one. It should also be understood that the resolution of this amplifier is greater to far greater than 98% of everything sold in the retail marketplace. The result is that the amplifier becomes a tool to evaluate your other components and the real magic or lack thereof in the recordings you listen to.

The amplifier will never be the weak link in your audio chain allowing a lifetime of upgrades elsewhere in your system and room.

Due to the unlimited holographic imaging and sound stage depth it is well worth exploring what can happen when the speakers are pulled away from walls and the walls are treated with acoustic treatments. The reason it is so hard to imagine going to so much trouble with the room is because the vast majority of us are unaware of true potential of holographic imaging. Even those of us lucky enough to witness really perfect rooms didn't hear it for the handicap of the mass produced retailed audio gear used for the demos.

Please invest some time in hunting down the weak links in your audio chain as you enjoy the wonderful sound of this amp. As you do, you'll hear your amp again for the first time and then all your music will become new as well. The more serious you get about the room acoustics, speaker matching, and source components the more you will understand what makes this amplifier so far above the norm.

To maintain some perspective it is also helpful to understand that if Decware used a conventional business model to manufacture retail audio gear, what you paid for the amp would have been exactly three times higher. It would be a waste of time to compare it with anything less than three times it's price, and the longer you own one the more you begin to understand that after a certain point of diminishing returns, price becomes placebo fueling the "Ultra" high end industry.



Steve Deckert / DECWARE

## Bridging into Mono

The SE84UFO can be connected as a mono amplifier and a single amp used to drive each loudspeaker. This is desirable when you want more power or you want to use shorter speaker cables.

When you bridge this amplifier the output typically more than doubles and gets closer to 6 watts rather than 4 watts due to it's nature of putting out more power as the speaker ohms drop.

You can hook up a 4 ohm speaker or 8 or even 16 ohm speakers to a bridged amp.

To wire the amplifier for mono two things have to happen.

- 1) A signal must be fed into both input jacks, usually accomplished with a Y-Cable.
- 2) The speaker jacks must be connected in series with a single piece of wire 10 to 12 inches long. It connects between the left positive and the right negative speaker jack on the amplifier. The two remaining speaker jacks, one on each side, are used to power the loudspeaker.

## Balanced Operation

Balanced operation can be achieved if the inputs are wired as shown with custom XLR to RCA jacks.

