



®



ODS-II Instrument Amplifier

V 1.0

Operations Manual

For ODS-II Models (heads and combo)

ODS-II 50, Custom-50 and 100-W

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®

A Note from Andy and Annette Fuchs,

First of all, *thank you* for purchasing the Fuchs ODS-II® amplifier!

The ODS-II I was designed to vastly expand on the sonic origins of the original ODS. Its design goals embody over 15 years of player feedback and was designed to be one of the most flexible amps of its kind. Each Fuchs product is precision handmade by the staff at Fuchs Audio, built to extremely high standards of excellence using the highest quality components. We at Fuchs Audio are extremely proud of the quality and tremendous musicality of all our products and the fine professionals who play them. We know you'll feel the same way.

Please read this manual carefully. Doing so will allow you fullest understanding of your amplifier and operation, thus quickly providing you the tones & performance you want. Your Clean Machine can only perform to its fullest glory by your full understanding of all its features.

Feel free to call or e-mail us (we prefer emails!) with comments & questions about your amp, or just to find out what's new here at Fuchs Audio.

Lastly, I recommend checking out our web site:
www.fuchsaudiotechnology.com, for product/user updates, cool links and other info benefiting our customers.

Sincerely,

Andy

Andy Fuchs
President

Fuchs Audio Technology®

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ODS-II© Instrument Amplifiers

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(Please note: Many of our amplifiers are custom-made, so not all features appear on all models. This operation manual will indicate features your particular model may or may not have. (Such as: 50/100 power switch, Artist footswitch or other options.)

1 Introduction to Fuchs Audio Technology Amplifiers

What makes our products unique?

The recent proliferation of "Boutique" amplifiers, allow guitarists to recognize what audiophiles have known for years, properly designed tube circuits can offer the finest musicality, detail, and sensitivity to playing subtleties of any type amplifier. Anyone who's enjoyed the sweet, responsive character of a well-built tube amplifier realizes you can't model or computer simulate the "organic" qualities, no matter how hard you try. It's like enjoying fresh food or food that's been frozen. Something gets lost in the translation.

We feel our designs go a few steps beyond those of other manufacturers!

In addition to refining our circuit designs and operating points with computer "Spice" modeling, we also spend countless hours tuning our circuits through careful parts selection and refining the internal layout of our products. Details like single-point star grounding of all internal circuits, premium audiophile grade power and output transformers, high speed switching diode power supplies, regulated and buffered DC power supplies for both filaments and high voltage sources, are key elements to producing an amp that has truly unique sonic advantages. All completed amps are compared to reference samples on both test equipment by live players before they may be shipped.

Our attention to the power supply and grounding result in an amp with extremely high gain capability, but with a super low noise floor. This reduction in noise and increases in overall circuit clarity makes the selection of components an even more critical element to achieving good tone. While we use many time honored component brands and features like "Orange Drop" Capacitors and/or carbon/metal film resistors, we also use Audiophile grade "Wonder Caps" and unique circuit refinements in many parts of our amplifiers as well.

It's a well-known fact that chassis materials can change the tone of the circuits built into them. We use an aircraft grade T-6 aluminum chassis, which is 1/6" thick, bent at its edges for strength, and when the front and rear panels are attached, forms a strong yet lightweight chassis. Aluminum also provides an excellent heat sink for excess tube, transformer, or regulator heat. Although we install fans in all models, our amps would dissipate plenty of heat even without a fan. The front and rear panels are attached to the chassis pan with pem-nuts, a 1/8 thick assembly formed at both the front and rear of the chassis for rigidity.

A combination of modern and traditional wiring methods

Internal construction in all models is based around a central circuit board, which supports most of the power supply and the amplifiers FX loop, driver and bias circuitry. The balance of the amp is hand wired, with particular attention paid to the preamp section and low-level circuits. All tube sockets are chassis mounted for strength and ease of replacement, in the unlikely event a socket fails. This also keeps tube heat away from the other internal components in the amps.

Our amplifier power supply starts with a high voltage supply, which is rectified using high-speed switching diodes, combining the sonic attributes of a tube rectifier, with the efficiency of solid-state diodes. These produce greater voltages, a more rigid supply that doesn't 'bend' under the stress of loud playing, and they also produce zero heat. This DC supply is highly filtered, using over 200 ufd of power supply filtering, contributing to an amplifier that has a strong voice yet remains loud & clear up to its limits.

Our output stage(s) feature separate bias for each power tube. Although we use premium "matched set" tubes as standard equipment, by individually setting bias, we can obtain maximum power before clipping, extending tube life with better tone. Our power amp driver circuit uses an AC balance trim control, which adjusts the signal balance to the power stage, keeping it linear, producing a clean, strong tone.

When driven to clipping, overloading is ultra- smooth, compressing in a sweet way, not at all aggressive or harsh.

Premium Transformers

Our power transformers are designed for highest self-regulation as well as conservative operation, assuring lowest heat and highest reliability. Our output transformers (depending on the model) are premium grade audiophile quality. We use custom built power and output transformers, as well as custom wound chokes by Mercury Magnetics. All amplifiers feature 4 and 8 ohm outputs, grain oriented steel cores, with heavy-duty mounting bells and hardware for maximum roadworthiness.

Buffered FX Loop

Our buffered FX loop features both series and parallel operation. It uses a conventional high-current biased cathode follower, which provides a low-impedance signal source, which is level adjustable and can drive from a pedal level to a rack mount unit cleanly. Two simple switches set series/parallel operation, signal levels from 0db to -20db, easily matching any and all effects, tube or solid state.

Studio Grade Reverb

The reverb section features a highly musical 16-Bit high resolution digital reverb based on the Spin Semiconductor FV-1 platform designed by Keith Barr of Alesis fame. It's interfaced via the FX loop tube. Because of the inconsistency of modern reverb pans we opted for a state of the art studio grade digital reverb. It's a quiet, dynamic reverb that sounds as warm and detailed as any tube or pan unit, plus the reliability of solid-state circuitry. This saves on both space, and heat generation within the amp. Our reverb is interfaced through the FX loop, adding warmth to the overall sound. Additional signal clarity is achieved by eliminating the common reverb mixer network used by most other manufacturers.

Our Preamp Circuits

Our preamp circuits form the heart-and-soul of our amplifier tone. Any subtleties lost or masked by preamp stages are truly lost forever. By operating our low-level circuits on a regulated and passively buffered high voltage supply, using a regulated DC supply, we completely eliminate the effects of conventional power supply filtering and decoupling. Audio signals can (and do) appear on power supply sources. Despite large filter capacitors these audio signals do not belong on the pure DC that a tube circuit needs to perform properly. This subtle coupling of signals from adjacent stages can produce a masking of inner detail and potential instability in other high gain circuits. A careful selection of passive parts (resistors and capacitors), as well as the active parts (tubes and/or solid state parts), results in the unique sonic signature our amps are becoming known for. We also use regulated DC filament power supplies, for lowest practical noise floor.

Internal Construction

We proudly can say our products are built better than ever. Our circuit boards are now two-sided extra thick boards, with heavy copper plating and a full solder mask. Our internal layout has been refined to minimize wire runs, lowering the noise floor to the circuit's practical limits. We still chassis mount our tube sockets for maximum strength, durability and serviceability. We hand select our tubes for lowest noise and optimal tone. Most models include a DC fan for low chassis temperatures and extended tube life. All passive parts are carefully chosen for both reliability and sonic attributes. Each and every Fuchs amplifier undergoes a week of cycled "burn-in" where it is on for 4 hours and off for 4 hours for a full week before leaving our shop. This ensures every Fuchs amp is built for the long haul. We also use pretested, matched and graded tubes.

2**Please read before powering up your ODS-II****Please see Panel Diagrams in next section **3** for assistance.**

- 1) Inspect to make sure power & pre-amp tubes are intact & snugly seated in their sockets.
- 2) Make certain a speaker (load) is plugged into the correct speaker input jacks on the back of the amplifier (4, 8, or 16 ohm). Failure to have a speaker connected to the amp will result in damage to the output tubes! Your ODS-II is supplied with multiple speaker inputs for various impedances, select the one closest to your speaker(s) impedance.
- 3) Reduce all Front PANEL controls moderate levels (approx at 7-9 o'clock positions).
- 4) (optional) Install cable into footswitch (either standard or Artist) and then connect into rear panel input marked FOOTSWITCH, using the supplied CAT 5 connecting cable.
- 5) Install instrument cable from guitar into front panel INPUT
- 6) Be sure both POWER is in fully DOWN position.
- 7) Install power cord to amplifier (AC POWER IN) and to proper AC power source.
- 8) POWER UP amplifier by: 1) flipping POWER switch UP to middle (standby position). WAIT at least 1 minute for tubes to heat up. 2) Flip switch up to operate mode, amplifier will now operate.
- 9) The Amplifier is now fully on and ready to use. Feel free to adjust all controls as you see fit.
- 10) Provide adequate and unimpeded ventilation.
- 11) Do not expose the unit to drips or splashes.
- 12) Do not place liquids on the unit.
- 13) Properly ground the unit (i.e. make sure the outlet used is grounded, and ground is not defeated between the outlet and unit).

TO PUT AMP IN STANDBY MODE- Simply flip the power switch to middle position.

TO PUT AMP IN PLAY MODE- Simply flip the STANDBY switch UP.

TO TURN AMP OFF Flip the power switch to standby mode. We then recommend (as a kindness to the output tubes) waiting at least 1 minute before flipping POWER switch DOWN hence fully shutting the amp down.

3 Diagrams of FRONT & REAR Panels and FOOTSWITCHES

Front Panel



Rear Panel



Effects Loops



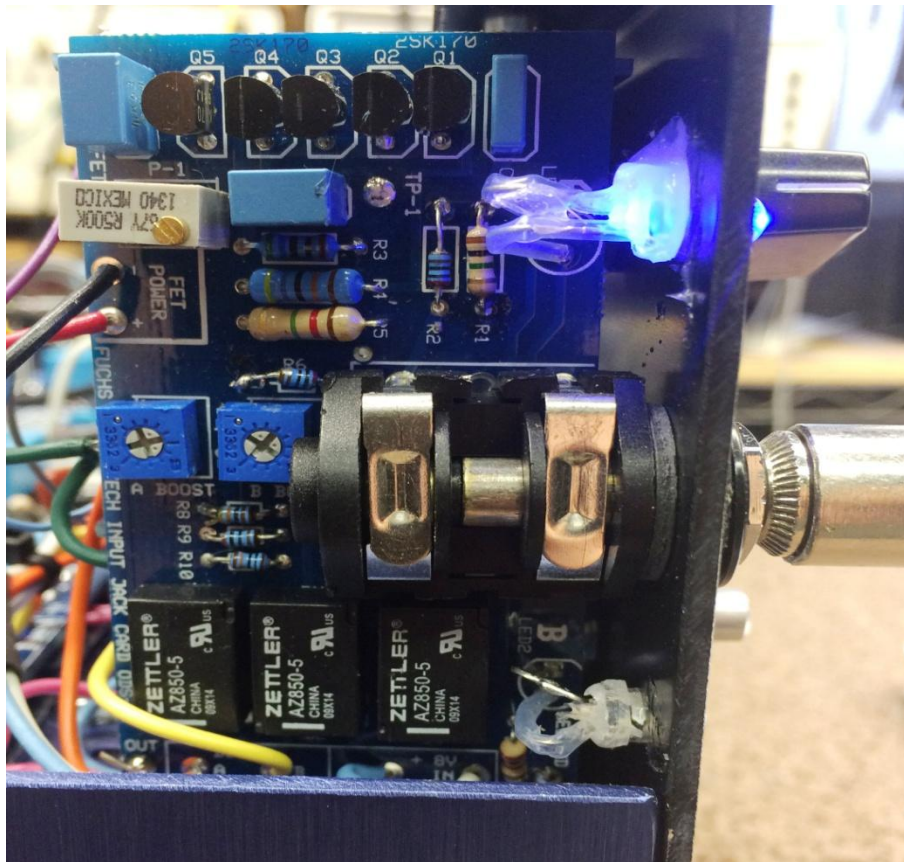
4 Front Panel Controls and Their Functions

Input Jack:

The input jack is a standard 1/4" phone plug, designed for a high impedance, guitar-level signal. This input will readily accept pedals/effects without any loss in performance. The design of the ODS-II amplifier is quite flexible, so may we first suggest exploring its performance without any effects or pedals initially ?

Gain Control:

Each channel's gain control sets the overall gain for that channel. Channel one has it's own master volume. For maximum cleans this must be above 12.00. With the gain boost and tone stack bypasses, and the master, Channel-1 can produce overdrive. There are two types of boost on each channel: Pulling the input gain pot of either channel produces a gain boost. It is preset from the factory and each channel has its own adjustment for that boost level located on the input jack PC board shown below. Do not adjust P-1 as it is factory preset preamp bias and requires proper test equipment to set.



Brite Switches:

Each channels Brite switch operates in conjunction with the gain control/and is active over about 1/2 of the input gain control range. From '0' to about midway, it provides a boost to highs, and the effect of the switch decreases beyond the halfway point on the gain control rotation. There are three positions: Center is off. Up is a more full range boost and down is a boost with a higher operating point in the frequency spectrum. Each boost has it's own application depending on the guitar, the pickups, speakers and player preferences.

Deep Switches:

The deep switches shift the overall tonality of the amplifier, increasing the low Frequencies. This is often useful for single-coil guitars, which sometimes need A low-frequency boost, or for jazz players who prefer the added warmth. Both channels have this switch and it's operation is identical on both channels.

EQ Switches:

The EQ switch alters the operation of the tone controls as well as providing a bypass to the tone controls. The gain boost on the gain control is our own design and the tone controls remain operational. The EQ switches are three positions. The middle is tone stack bypass and two different styles of tone control cooperation and eq are provided. Up is a higher gain rock and pop mode, while down is a more lean audiophile/studio style or Jazz type EQ. The upper position is the highest gain, and a brighter equalization. In the downward setting, the tone is a more neutral/linear tone. All tone controls work in both modes, however their range and depth of operation is changed.

High Controls:

The High control serves 2 functions: (IN)-it adjusts high frequency spectrum. (OUT) the High control also engages the mid-boost. This shifts the range of the high control downward, to include more midrange. All tone controls still operate, however the tone will be fatter. This mid boost works in conjunction with the mid control pull pot which changes the mid boost operating point.

Mid Control:

The Mid control serves 2 functions: In and out it acts to adjust mid boost or cut. Pulling it out changes the frequency of the mid boost when engaged from the high control. This warms the overall midrange tone and this can also fatten sound for single coil pickups.

Low Control:

This control adjusts the low spectrum of the amp.

Overdrive controls: Channel 2 (only) has a separate overdrive section which follows the main preamp section. Drive sets the amount of signal INTO the overdrive stage. Output master pulls to engage the overdrive (which overrides the footswitch), and overdrive tone, allows you to tune the overall overdrive tone.

The Reverb Controls: (Decay and Level)

The reverb controls allow the widest range of reverb adjustment on any amp made today. The level control sets the mix level of the reverb. The dwell control adjusts the audible "size" of the reverb space and decay time. Low is the shortest (small room sound) while up is the deepest. In the midrange portion of rotation you will find the closest decay structure to a traditional pan reverb.

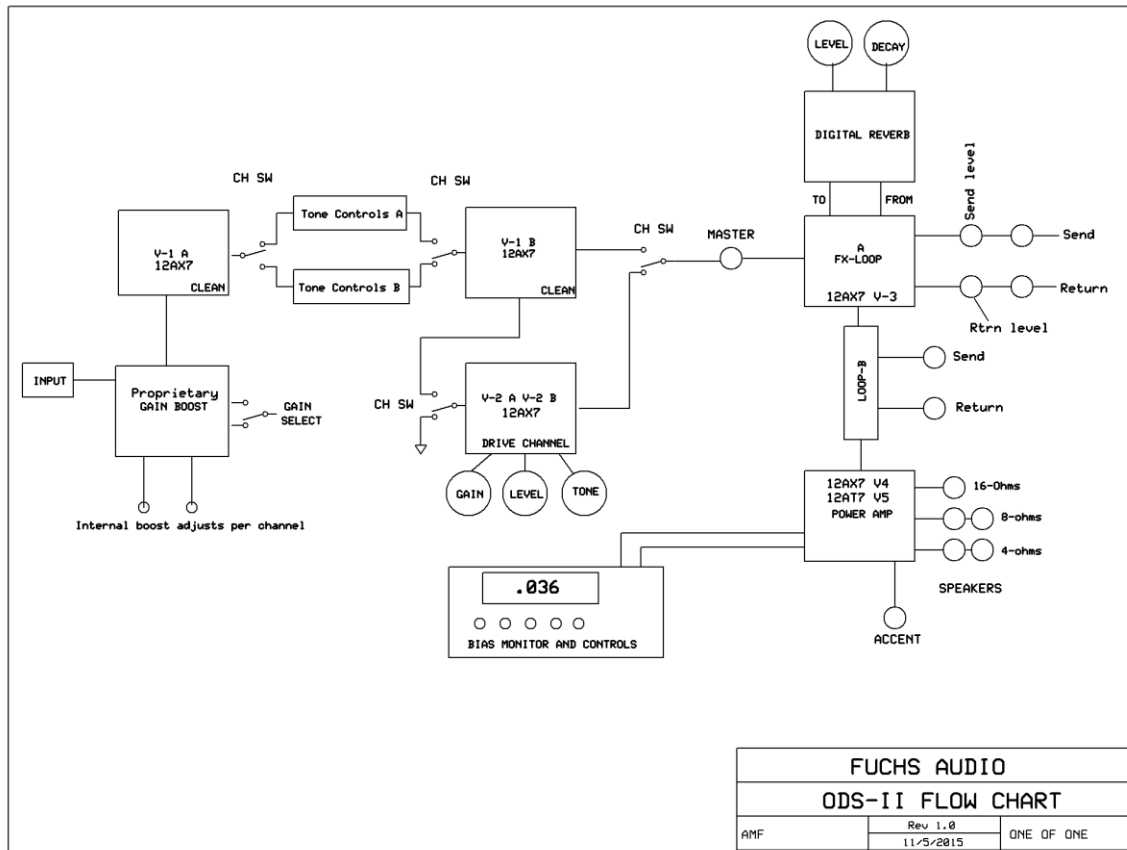
There are no "correct" Reverb settings, finding the desired tone setting depends on the guitars/pickups used, as well as your own personal tastes.

Accent Control:

The accent control works within the power amp section, reducing negative feedback at higher frequencies. It adds an edge to the overall amplifier tone. It's excellent for cutting through in a band or a recording mix. It can also allow greater ability to selectively make notes feed back and "sing".

Master volume: The global master volume controls the overall level of the entire amp. After channel volumes (or ratio) is set the overall mix can be retained and the entire amp level moved up and down.

Internal trimmers: There are two user adjustable internal trimmer pots: HFOD adjusts the amount of highs into the overdrive and the OD-trim which adjusts the drive into the overdrive from the preceding preamp stage. Both are set to the most popular settings we've used over the years on the ODS and TDS amps. There is an AC balance control (for the power amp phase inverter) which requires test gear to properly set. are no internal tone altering controls in a Clean Machine. These controls are best left to professional technicians, who have the proper measuring equipment to set them properly. There are hazardous voltages present in any tube amplifier, even after it has been shut off for some period of time. Please exercise extreme caution when the chassis is exposed out of the cabinet !



5 REAR Panel Controls, inputs/outputs and Effects Loops



AC power cord input:

Using the supplied power cord. Connect AC POWER IN on amplifier and to AC power source. Please confirm your line voltage matches that of the amplifier!!!

AC power Fuse:

This fuse protects the amplifier if any malfunction occurs. Use ONLY stock fuse rating as supplied by factory. 50-W amps use 4-A slow blow and 100-W models use 5-A slow blow for 120 volt use. For 240 volt use use half the listed values.

DC power fuse:

The DC fuse is for the B+ supply feeding the power tubes and preamp. On a 50-W it's 1 amp fast blo, and on 100-W it's 1.25A fast blow. This fuse failing indicates a potential output tube fault or incorrect biasing. Consult the factory if this fuse blows.

Fan Speed:

We recommend the fan be operated at all times. The fans are fairly quiet so hi speed is acceptable. In a home environment or studio the low setting may be used. While you can shut the fan of completely, it does increase the operating temperature of the chassis and internal box will be higher.

Full/Half power: On the Custom-50 and 100-W models, this switch disables two of the four power tubes for half power operation. When in half power mode, the speaker impedance changes: You must put 16 ohm speakers in the 8 ohm jack, and 8 ohm speakers in the 4 ohm jacks to compensate for the change in impedance from cutting off two power tubes. While you can run the speakers wired normally you will lose more than the expected 50% power drop by doing so.

Speaker Outputs:

(You should have a speaker load inputted to the ODS-II before powering on).

Connect using a 1/4" phone plug to an outboard speaker cabinet. Use a speaker cable, NOT a guitar cable !! Multiple speaker inputs are provided on your ODS-II (4, 8, 16 ohm). Connect speaker(s) to jack(s) that most closely matches your speaker(s) impedance. When using an external speaker with a combo, it will be necessary to move the speaker connection to the proper output for the value of the speakers in

use. Two 8 ohm speakers would be a 4-ohm load. 2-16 Ohm speakers present an 8 ohm load. Do not use more than one proper output. Using multiple outputs can cause output transformer overload and/or power tube failure. This is true of any tube amp, not just ours.

Effects loops:

Loop-1 (main loop)

The primary loop is the standard Fuchs ODS loop, which allows for series or parallel operation as well as line or pedal level operation. It follows the master volume on the front panel and precedes the secondary series only "patch loop".

Series/Parallel Pull Switch:

When in Series Mode-the amplifier must have effects connected to the loop, or amp will not produce sound. When in Parallel-Mode amplifier will always produce sound. Parallel mixes effect signal with drive signal, which then remains in amplifier. Normal position (when not using loop) is control IN.

Return Trim Pull Switch:

Sets sensitivity & adjusts sensitivity of return input of the effects loop. This allows tailoring of signal of effect or rack device. If using an effect which requires more return sensitivity, pull this control out. Normal position is IN.

Return adjustment control:

This allows overall volume adjustment of amp (to set unity gain), thus retaining same volume with or without effect). This control sets the level coming back from your effects, also a secondary means of adjusting return of effect signal. The series parallel switch controls whether the loop is "open" (series) or "closed" (parallel).

Return Input jack:

Connects to OUTPUT FROM your EFFECTS

Send Input jack:

Connects to INPUT TO your EFFECTS.

Send adjustment control:

Adjusts signal level going to effect. Adjust send control so that effect receives maximum amount of signal before distorting.

Using the secondary patch Loop:

This loop is best used for inserting devices like an equalizer, or perhaps a Sonic Maximizer (or similar processor). It can also be used for a volume pedal controlling the entire amp including the reverb. This is a line level loop which follows the primary loop and precedes the power amp section. It runs at approximately 10-K output impedance and 1-meg input (return) impedance. Signal levels average .500 to 1.5 volts.

Side-Chaining Effects:

For maximum signal purity and sound quality, when using effects like an echo or tape delay, the loop can be used in parallel mode. In this case, the effects should be run fully "wet" (no non-processed signals sent through the effect). The send and returns of the loop are set for proper balance of clean/effect and the controls on the effect can be used to trim the tone.

This method assures the clean (dry) non processed signal will remain in the amplifier, and not be degraded by the outboard effect. In some cases, phase cancellation may result. In this case, the effect should be adjusted for correcting the output phase (if possible) or the effect must be used in series mode only. Phase

cancellation is marked by losses in bass or a thin “sucked out” quality, when effects are engaged.

6 FOOTSWITCH:

Standard 6-Way footswitch:

Connects via 5-pin “CAT-5” cable (supplied) to rear panel input. This footswitch allows remote control of 6 functions: mid-boost and gain-boost for both channels, reverb mute and channel switch. Additional options are available on the auxiliary footswitch by custom order. These include: Global Mute, bypass for each loop, as well as the tone stack bypass on the front panel. These options can be run on an additional footswitch or via various switching systems like the RJM Amp Gizmo, TC Ground control etc. Patch boxes are available to use the CAT-5 output connectors as ¼” jacks.

7 Biasing power tubes and other technical info

Biasing:

The ODS-II is one of the first commercial musical instrument amps to allow complete control and monitoring of power tube currents externally, without the need for meters, test sets, probes or taking the amp apart. The bias meter and controls are shown below. There is one control per power tube and a rotary switch selects the tube being monitored and it’s rotation corresponds to the respective control. For example, start with it fully rotated to the left. The first control on the left side should now be adjusted. Moving to the next position moves to the next tube and so forth. A 4 tube amp has four active positions. A two tube amp has only two. The switch has 6 positions, but the remaining positions may show zero volts or a small residual voltage when in a non-used position. Once bias is set, the meter switch should be set to an unused position. The following are the current ranges for the respective tubes in a 50, a custom-50 and a 100-W ODS-II:

6V6: (4 are supplied in an ODS-II Custom-50) should be set to 22 ma per tube. They can be run lower or higher (10 to 30), but optimal is 22-ma, as shown on the meter.

6L6: 2 are supplied in an ODS-II-50 and 4 in and ODS-II 100. They should be set optimally to 36 ma each. They can be run from 20 to 45 ma, optimal balance of tone and tube life is 36 ma.

EL-34: Any ODS-II may be run with EL-34’s. IN this case optimal bias should be 40 ma per tube.

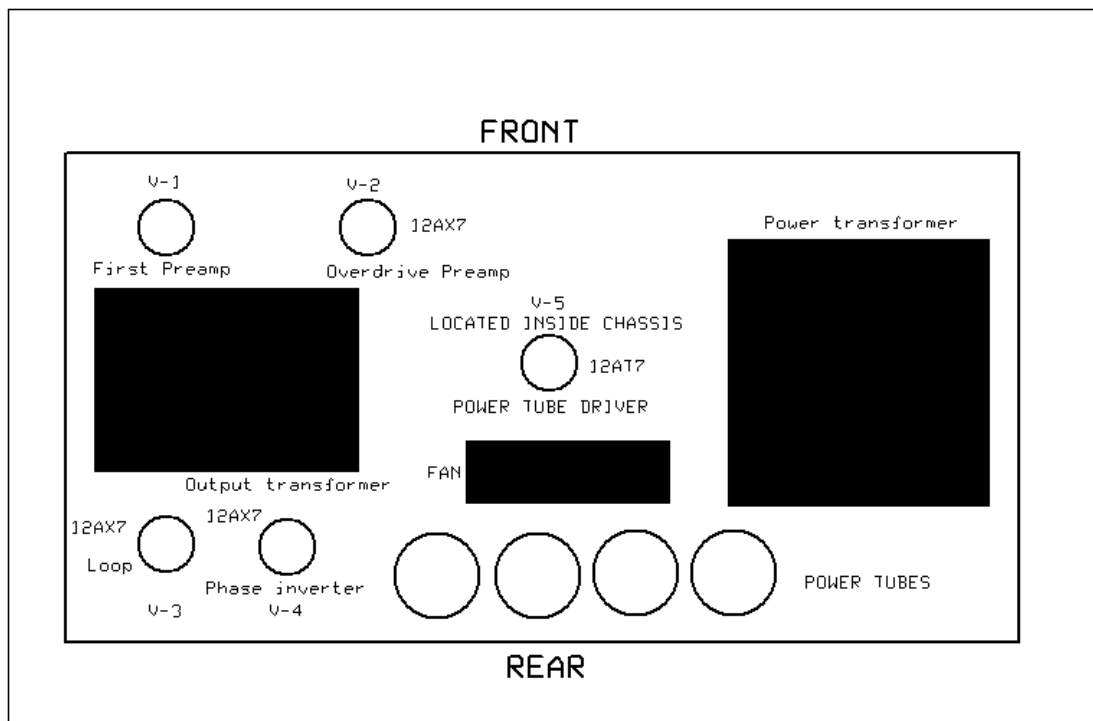
While other tube types are available, we have no experience with them and cannot advocate nor make recommendations for anything other than what’s listed here. Any damage to the amp, bias metering or circuitry is not covered by warranty.



High Internal voltages inside this amplifier can cause harm or Death!

AC Balance:

This is factory set for linear clipping at maximum power output, and is set with an oscilloscope for proper adjustment.



ODS-II tube placement and function diagram.

DISCLAIMER: There are exposed Internal high-voltages in this amplifier. Do not attempt to service, repair or conduct tube biasing unless you are qualified to do so. Please contact Fuchs Audio beforehand with questions in this regard. Fuchs Audio takes no responsibility or shall be held liable for any personal harm caused or damage to this amplifier as a result of unauthorized service, repair or internal adjustments made to this amplifier.



8 Warranty Information

The Fuchs Audio Technology-ODS Warranty

Fuchs Audio Technology® guarantees our products to be free from defective workmanship or material failure for a period of five years from date of new purchase to the original purchaser. This does not apply to Fuchs amplifiers that have been tampered with, damaged by shipping carriers, reverse engineered, or modified. This warranty is void if the amplifier is used with power attenuator type devices (Power Soaks, Air Brakes, Hot Plates etc.). Your warranty form/information must be returned to Fuchs Audio Technology® within 30 days of purchase, or your warranty will not be in effect.

Fuchs Audio Technology® reserves the right to suspend or terminate the above warranty at our sole discretion, should damage from any of the above limitations and or exclusions be detected upon examination.

Keep the information on this page for your records.
Please mail-in warranty form on next page

FUCHS MODEL _____

SERIAL NUMBER _____

Date of purchase and dealer name _____

Fuchs Audio Technology ®
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®

WARRANTY REGISTRATION FORM

This completed form must be returned to Fuchs Audio Technology within 30 days of purchase along with a copy of your receipt from your authorized dealer.

Please fill in all requested information on this form so we may register you for future warranty repairs or future upgrades, should they become available.

Purchasers Name _____

Address _____

City _____ State _____ Zip _____ Country _____

Phone Number _____

E-Mail address _____

Model _____

Serial Number _____

Date of Purchase _____

Dealer Name _____

Comments: _____

Please return this form to:

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