

# CERIATONE

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AMPLIFICATION

# CHUPACABRA

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*Hot Rodded Plexi Series*

**100W AMPLIFIER**

## **Table of Contents**

1) About the Chupacabra.....	page 2
2) Quick setup.....	page 3
3) Front Panel controls.....	page 4
4) Rear Panel controls.....	page 8
5) Tube compliment and external bias jacks and adjustment.....	page 10
6) Frequently Asked Questions.....	page 14

### **1) About the Chupacabra 100W amplifier**

Our British series of amplifiers has been overwhelmingly popular, and is still the backbone of our amplifier line. We have been pleased to provide many players access to our unique take on these legendary amplifiers. With excitement, we are branching out into another series – the HRP series (“hot-rodded Plexi”).

If you don’t already know, the chupacabra is a mythical creature known for its violent attacks on animals and penchant for drinking the blood of its victims. Sounds evil, right? Well, so does the amplifier at hand. Don’t let the name fool you, though, because it is capable of much more. This amplifier particularly draws upon the lineage of famous 1980s amp technician Jose Arredondo, but with modern twists and refinements. We’ve voiced the power section to be larger and more dynamic, and the preamp to be more versatile. We’ve added unique features like a passive FX loop *in between* the preamp and power amp, individual power tube bias control, and DC regulated preamp tube filaments for lowest noise floor possible.

While our work could not have been possible without the gracious information shared over the last decade in the public domain, we hope you appreciate our modifications, component selection, and construction techniques. Most of all, we hope the “Chupa” becomes an integral part of your tone equation to exhilarate your playing and music.

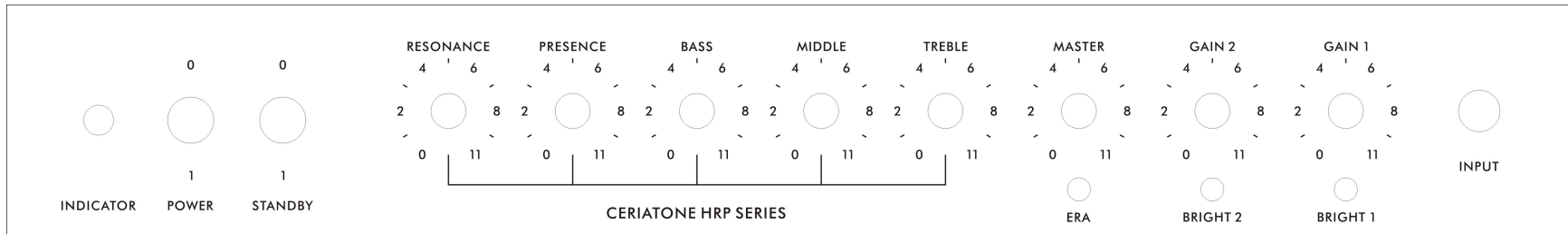
Rock on!

- Nik Azam

## **2) QUICK SETUP** *(for instant gratification)*

- 1) Plug your guitar using a 1/4" instrument cable into the INPUT on the right of the front panel
- 2) Plug a suitable power cable from the Chupa's rear panel MAINS cable inlet to your wall power receptacle
- 3) Plug the Chupa into your speaker cabinet using 1/4" speaker cable
- 4) Set the OUTPUT SELECTOR to match the impedance of your speaker cabinet
- 5) Set all rotary controls on the front panel to 12:00 (clock face)
- 6) Set ERA control to the far right position
- 7) Set BRIGHT 1 and 2 to the far left positions
- 8) Set front panel POWER switch in the "1" position (down position, with adjacent STANDBY switch in the "0"/up position) for 30 seconds to allow tube filaments to warm up
- 9) Set front panel STANDBY switch to "1" mode (down position)
- 10) **ROCK!!!!!!**

### 3) FRONT PANEL CONTROLS



From left to right:

- 1) **INDICATOR LED**
- 2) **POWER** 2-way toggle switch
- 3) **STANDBY** 2-way toggle switch
- 4) **RESONANCE** control
- 5) **PRESENCE** control
- 6) **BASS** control
- 7) **MIDDLE** control
- 8) **TREBLE** control
- 9) **MASTER** control
- 10) **ERA** 3-way toggle switch
- 11) **GAIN 2** control
- 12) **BRIGHT 2** 3-way toggle switch
- 13) **GAIN 1** control
- 14) **FOCUS** push/pull control (located on GAIN 1)
- 15) **BRIGHT 1** 3-way toggle switch
- 16) **INPUT** 1/4" instrument jack

**INDICATOR** will illuminate when the Chupacabra is powered by turning the front panel **POWER** toggle switch to the ON position. If **INDICATOR** does not turn on, check your power cable connections, and then the fuse on the rear of the unit.

**POWER** two-way toggle switch powers the Chupacabra on and off. With the toggle switch in the UP (“0”) position, the Chupacabra is OFF. In the DOWN (“1”) position, the Chupacabra is ON.

**STANDBY** applies high voltage to the vacuum tube anodes (and screen grids) during use of the Chupacabra. To ensure long tube life, first power the unit on with the toggle switch in UP (“0”) position for approximately 30 seconds. Then switch to DOWN (“1”) to use the Chupa. With the toggle switch in the UP position, the Chupacabra is in STANDBY mode. In the DOWN position, the Chupacabra is in OPERATE mode

**RESONANCE** adjusts the low frequency response of the power amplifier using negative feedback. Use this control to add depth, punch, and “thump” to your tone.

**PRESENCE** adjusts the high frequency response of the power amplifier using negative feedback. Use this control to add sparkle and clarity to your tone.

**BASS** adjusts low frequencies in your amplifier.

**MIDRANGE** adjusts the mid frequency response.

**TREBLE** adjusts the high frequency response.

**MASTER** sets the overall volume of your amplifier.

**ERA** provides 3 tonal options. You can think of this covering 3 different decades of tone. In the middle position, the amplifier will be cleaner, less compressed, and very woody. We consider this our late ‘60s mode, as it very accurately captures the sound of original Plexis. The right position is our ‘80s voicing. This adds saturation and compression, and is reminiscent of ‘80s modded Plexis coming out of LA. This voicing is great for hard rock, thrash metal, etc. The left position is our modern voicing. This adds even more saturation and compression, and also smoothes the top end response thus preventing any harsh overtones with this amount of gain. We love this mode for all things metal.

*NOTE* - Just like the original “Jose mods”, these different modes will impact the taper response of the MASTER control. In other words, some settings might seem louder than others. In reality, equal volumes are happening sooner or later on the control. The ‘60s mod hits stage volume soonest, and the Modern voicing hits stage volumes latest. Don’t be afraid to turn up the MASTER control in the ‘80s and Modern modes!

**GAIN 2** adjusts the signal strength coming out of the second gain stage, and going into the third tube stage. Think of this as a “saturation” control that will impact pick attack, compression, and feel. Depending on the BRIGHT 2 setting, you can also use this to shape the high and low frequency response of your Chupacabra.

**BRIGHT 2** is a high-frequency boost that can be used to add sparkle *and gain* to your tone. In the middle position, BRIGHT 2 is defeated. In the left position, it boosts upper mid and high frequencies, and adds noticeable gain. With the toggle switch in the right position, it boosts extreme high frequencies, and adds less gain boost than the right position. In conjunction with an active Bright 2, lower GAIN 2 settings will also trim the bottom end. This high frequency boost / low frequency cut is more prominent as GAIN 2 is turned down.

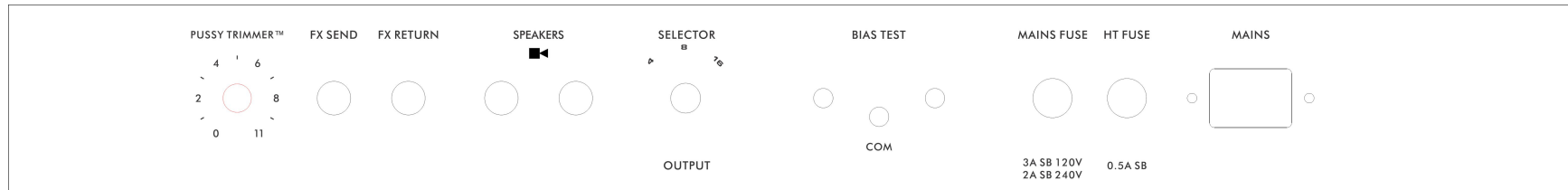
**GAIN 1** adjusts the signal strength coming out of the first gain stage, and going into the second tube stage. Think of this as a global “gain” control. Depending on the BRIGHT 1 setting, you can also use this to shape the high and low frequency response of your Chupacabra.

**BRIGHT 1** is a high-frequency boost that can be used to add sparkle *and gain* to your tone. In the middle position, BRIGHT 1 is defeated. In the left position, it boosts upper mid and high frequencies, and adds noticeable gain. With the toggle switch in the right position, it boosts extreme high frequencies, and adds less gain boost than the right position. In conjunction with an active Bright 1, lower GAIN 1 settings will also trim the bottom end. This high frequency boost / low frequency cut is more prominent as GAIN 2 is turned down.

**FOCUS** control is a push/pull switch located on GAIN 1. With the control pushed in, it is defeated. Pulling out the GAIN 1 control engages FOCUS. FOCUS will reduce bottom end, reduce saturation, increase midrange, and accentuate pick attack.

**INPUT** is a ¼” jack for instrument cables. Plug your guitar in here.

## 4) REAR PANEL CONTROLS



- 1) **PUSSY TRIMMER™** control
- 2) **FX SEND** 1/4" instrument jack
- 3) **FX RETURN** 1/4" instrument jack
- 4) **SPEAKERS** 1/4" speaker jacks (x2)
- 5) **OUTPUT SELECTOR** three-way rotary selector
- 6) **BIAS TEST** probe jacks (x3)
- 7) **MAINS FUSE** T2A slow blow fuse
- 8) **HT FUSE** T500mA fuse
- 9) **MAINS** IEC cable inlet

**PUSSY TRIMMER™** allows you to further fine tune the gain and saturation the Chupa. Turning this control down can reduce the possible saturation and gain. We recommend turning this up to about 2:00 for the standard gain and response. If it's too much and too hard to control, you can reign things in by turning the PUSSY TRIMMER down. If you take steroids, jump out of planes, and wrestle bears you can just go ahead and crank the PUSSY TRIMMER all the way to the max (clockwise).

**FX SEND** 1/4" instrument jack can be used to directly interface the preamp of the Chupacabra, thereby bypassing the power amplifier. Conversely, this is usually used as the SEND of the effects loop. Plug the input of your effects unit, or interface device (ex – C-lator, Klein-ulator) into this jack using 1/4" instrument cable.

**FX RETURN** ¼" instrument jack can be used to directly interface the power amp of the Chupacabra, thereby bypassing the preamp and using the amplifier as a power amplifier. Conversely, this is usually used as the RETURN of the effects loop. Plug the output of your effects unit, or interface device (ex – C-lator, Klein-ulator) into this jack using ¼" instrument cable.

**SPEAKERS** ¼" speaker cable jacks. Use a ¼" speaker cable to connect your speaker cabinet to the amplifier using these jacks. If you use one speaker cabinet, either jack is acceptable.

**NOTE** – *never turn your amplifier to OPERATE mode ("1" / DOWN position on STANDBY) without connecting the amplifier to a speaker cabinet or suitable dummy load! Failing to do so may damage your amplifier!*

**OUTPUT SELECTOR** three-way rotary selector. Set to the position that matches the impedance of your speaker cabinet.

**NOTE** – *if you are using two speaker cabinets in parallel (ex – two 16 Ohm cabinets), set the impedance selector to half that of a single cabinet (in this case, 8 Ohms).*

**BIAS TEST** multimeter probe jacks – use this for external bias current measurements (see Section 5, Page 10)

**MAINS FUSE** slow-blow fuse – used to protect your amplifier from voltage spikes or excessive current draw. Replace only when necessary. 3A is used for amplifiers used with a 120VAC country supply, and 2A is used with 240VAC.

**HT FUSE** T500mA fuse – used to protect your amplifier from voltage spikes or excessive current draw. Replace only when necessary.

**MAINS** IEC cable inlet – plug a suitable IEC power cable into this inlet to power your amplifier

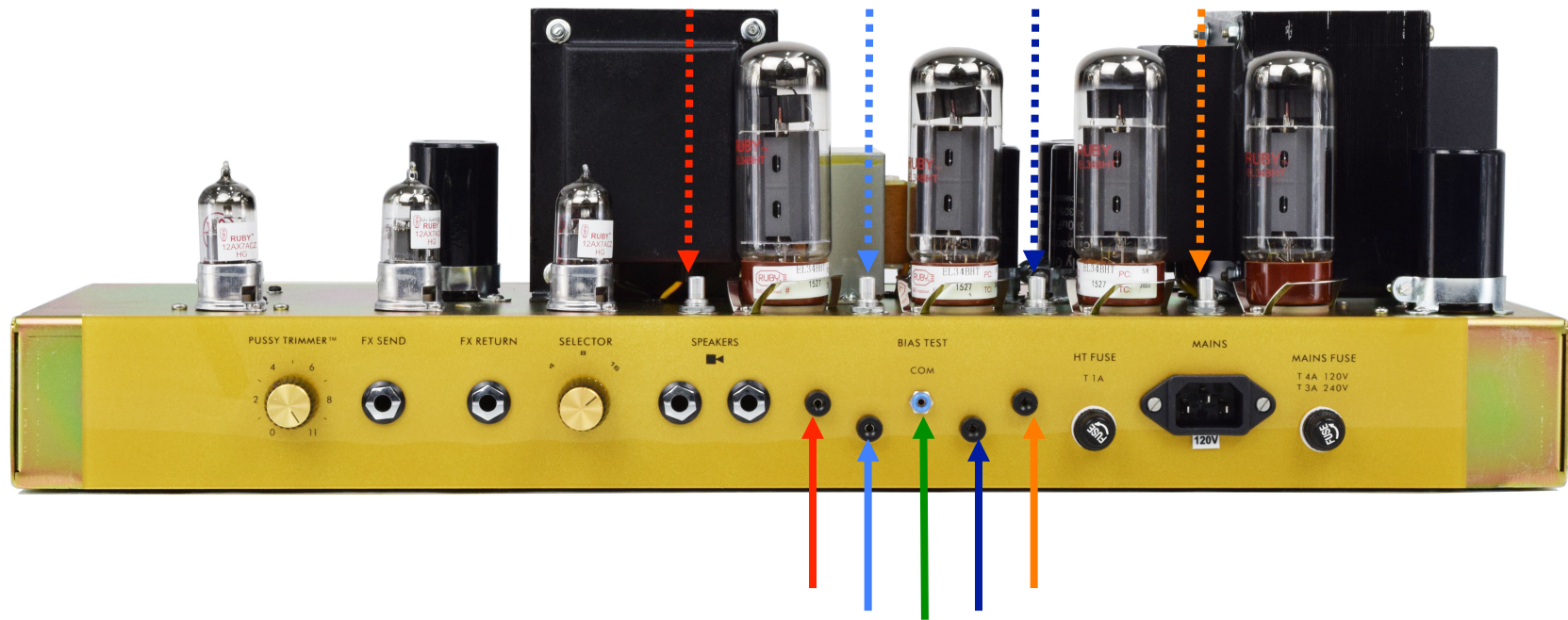


## 5) TUBE COMPLIMENT AND EXTERNAL BIAS JACKS AND ADJUSTMENT



From left to right:

- V1 – 12AX7/ECC83 (input stage 1 and gain stage 2)
- V2 – 12AX7/ECC83 (gain stage 3 and tonestack driver)
- V3 – 12AX7/ECC83 (phase inverter for power amplifier)
- V4 – EL34
- V5 – EL34
- V6 – EL34
- V7 – EL34



In this diagram, we have color coded five features for simplicity

- 1) Red (solid) arrow = probe jack, V4
- 2) Blue (solid) arrow = probe jack, V5
- 3) Green arrow = probe jack, GROUND
- 4) Purple (solid) arrow = probe jack, V6
- 5) Orange (solid) arrow = probe jack, V7
- 6) Red (dashed) arrow = bias adjustment potentiometer shaft, V4
- 7) Blue (dashed) arrow = bias adjustment potentiometer shaft, V5
- 8) Purple (dashed) arrow = bias adjustment potentiometer shaft, V6
- 9) Orange (dashed) arrow = bias adjustment potentiometer shaft, V7

To measure your power tube bias, carefully follow these steps **with the amplifier in OPERATE and connected to a speaker load (not doing so may damage your amplifier!)**:

- 1) Turn on a digital multimeter (DMM), and set it to read millivolts (mV) in the 100mV range (this will vary from DMM to DMM)
- 2) Plug a black probe into the color-coded jack on your DMM, and do the same for a red probe
- 3) Insert the black probe tip into the GROUND probe jack (green arrow). This is GROUND in the amplifier.
- 4) Insert the red probe tip into the V4 probe jack (red solid arrow) on the far left. This measures bias for V4.
- 5) Adjust V4 bias adjustment (red dashed arrow) SLOWLY until your DMM reads approximately 36mV (see calculations, following page)
- 6) Remove the red DMM probe tip from the V4 probe jack (red solid arrow), and insert into V5 probe jack (blue solid arrow). This measures bias for V5.
- 7) Adjust V5 bias adjustment (blue dashed arrow) SLOWLY until your DMM reads approximately 36mV (see calculations below).
- 8) Remove the red DMM probe tip from the V5 probe jack (blue solid arrow), and insert into V6 probe jack (purple solid arrow). This measures bias for V6.
- 9) Adjust V6 bias adjustment (purple dashed arrow) SLOWLY until your DMM reads approximately 36mV (see calculations below).
- 10) Remove the red DMM probe tip from the V6 probe jack (purple solid arrow), and insert into V7 probe jack (orange solid arrow). This measures bias for V7.
- 11) Adjust V7 bias adjustment (orange dashed arrow) SLOWLY until your DMM reads approximately 36mV (see calculations below).

To calculate bias, there are two pieces of information you need to know: your amplifier's power tube plate voltage, and the published value for maximum plate dissipation for the power tubes used in your amplifier. To save you some time and energy, here are those two values:

- Approximate V4-5 plate voltage for Chupacabra 100W series amplifiers = 420-435VDC
- Maximum plate dissipation for EL34s = 25W

...and now some math. The formula for calculating bias is as follows:

$$\frac{\textit{maximum plate dissipation}}{\textit{amplifier plate voltage}} \times \textit{percent of maximum dissipation} \times 1000 = \textit{bias current (mA)}$$

In most cases, amplifiers are biased between 50% and 75% dissipation. We bias the Chupacabra to approximately 35-37mV on a DMM, which is 65% dissipation.

An example is as follows:

$$\frac{25W}{430VDC} \times 65\% \times 1000 = \textit{about 35 - 37mA}$$

You might wonder why your DMM is set to millivolts and not milliamps – simply, we have a 1 Ohm resistor placed between your probe jacks and ground to convert a current reading to a voltage reading. That way, a bias current of 36mA measures as 36mV on your DMM.

**NOTE – Only set your DMM to mV for measuring bias on the Chupacabra amplifiers. Not doing so may damage your DMM.**

One of our favorite features of the Chupacabra 100W is our use of a dual-bias adjustment. While it might seem like twice the work to bias your amp, what it does allow is use of unmatched power tubes. In fact, you can use different brands of EL34s. Moreover, with the exponentially increasing price of NOS matched power tubes, this is an effective way at saving some money – just purchase individual tubes and “match” them to your amplifier yourself!

## *A FEW COMMENTS ON BIASING*

Due to the nature of vacuum tube amplification, there are inherent risks when biasing your amplifier. Extremely high-voltages are present, and vacuum tubes reach high temperatures during use.

The risk of electrical shock and/or skin burns should ALWAYS be kept in mind. Therefore, bias at your own risk, and only while paying attention and taking all precautionary measures.

Biasing should only be done on a clean workbench with no distractions. Do not wear loose clothing or any jewelry. Take your time, and think carefully before each step.

Even though the bias test points and adjustment is external to reduce risk of electrical shock, all precautions must be taken while biasing.

Again, bias at your own risk. Ceriatone Amplification is not responsible for any damages or injuries resulting from user biasing.

## 12) FREQUENTLY ASKED QUESTIONS

*How do I hook up this thing?*

- See Section 2, beginning on page 3.

*Is the FX loop series or parallel? Active or parallel?*

- The FX loop is series, and is currently parallel. However, we have plans to release an option for a tonally transparent solid-state FX loop. Stay tuned!

*When I plug effects into the effects loop, my tone noticeably changes. Sometimes the effects don't sound quite right. What's the deal?*

- Generally, what you're hearing is a significant mismatching of impedances, and/or an overloading of the effect unit itself. Most rack-mount units have different input impedance than pedals, and thus can *sometimes* function fine without a buffer before them. In addition, *some* of these rack-mounted effects can pad the volume they receive, preventing it from overloading. Pedals do not have proper input impedance or padding ability, and therefore do not play nicely.
- For best results, an effects loop interface like the C-lator or Klein-ulator should be used with the Chupa amplifiers. These units prevent impedance mismatching, as well as provide the ability to pad down the volume sent to the effects units hence preventing any overloading.

*Sometimes when I play with both BRIGHT switches engaged, the amp wants to feedback/squeal. Is this normal?*

- For an amp with this much gain and lack of treble roll off, yes. We've carefully tuned the resonant frequency of the amp to exemplify the sound of the hot-rodded Plexis of yore. A byproduct of this voicing is the tendency to feedback if both BRIGHT controls are engaged, which dramatically boosts the upper-mid and high frequency content.
- If this is an issue, you can simply turn off BRIGHT 2, or decrease gain settings, or turn down your guitar volume during breaks. If you need all of that gain, and then some, we recommend a noise gate (standard procedure on any modern high-gain amplifier).
- However, if you are a straight-to-amp player, we have installed a trimmer aptly named "PUSSY TRIMMER". The amp is sent from our test bench with it at its maximum setting (out of circuit). If this background gain wash and tendency to feedback bothers you, you can turn down this control to reign in the amplifier's "gainiac" nature. The PUSSY TRIMMER is currently offered on the rear panel.

*Can I substitute different tube types for the 12AX7/ECC83s or 6L6GCs?*

- Although you can try 12AT7s, 12AU7s, 5751s without any harm, the design is optimized for 12AX7s, and are therefore the only recommended tube in the preamp positions. Usage of other power tubes (ex – 6550s, 6L6GCs, modern 6V6s like Electro-Harmonix, JJ) may be possible, but please first consult Ceriatone Amplification or your local competent amplifier technician.

*What settings do you recommend?*

- See Section 2, Page 3.

*Yeah, I read that already. I love '80s hair metal. Can this amp do that?*

- Hell yeah! Put the GAIN controls at 12:00, both BRIGHT switches to the left. Select ERA in the right ('80s) position. Turn the MASTER up to about 1:00. Turn MIDRANGE all the way up, start with BASS around 11:00, TREBLE around 2:00. PRESENCE and RESONANCE around 10:00. Make sure you have your spandex handy.

*Wait, I actually love metal. Can this amp do that?*

- Hell yeah! Put Gain 1 at 1:30, Gain 2 at 11:00. Both BRIGHT switches to the left. Select ERA in the left (modern) position. Turn the MASTER up to about 3:00. Start with BASS around 9:30, MIDRANGE around 11:00, TREBLE around 2:00. PRESENCE around 11:00 and RESONANCE around 1:00. Make sure your neck is properly stretched beforehand.

*Sorry, I just want to rock. Classic-like. Can this amp do that?*

- Hell yeah! To get the sound of a classic Plexi, try the following: Set GAIN 2 around 9:30. Set BRIGHT 2 to middle position. Turn RESONANCE all the way counter clockwise. Set TREBLE, MIDDLE, BASS, and PRESENCE to taste. Turn BRIGHT 1 to far right position. Turn up the MASTER all the way, and use GAIN 1 as a traditional channel volume on a non-master volume Plexi. Make sure your school boy uniform is clean.

*Do I need to use a matched and balanced phase inverter?*

- It is not necessary. Feel free to experiment with different tubes (of the same type) in your Chupacabra, though!



*I've read that the components used in this type of amplifier are really important. What is inside my Chupacabra?*

- We use a combination of parts custom-made for us to our specifications (power transformer, output transformer, choke, high-temperature / low-ESR electrolytic capacitors) and those used in our British series (1/2W carbon composition resistors, 1W carbon film resistors, Mallory 150M polyester film capacitors, high-voltage silver mica capacitors, Belton tube sockets, and Alpha potentiometers, Cliff jacks). Finally, we occasionally use NOS components from our vast surplus parts collection in locations they work well and complement the voicing or enhance the performance of the amplifier.

*I like to use rack-mounted multieffects units. What is the output level straight from the EFFECTS LOOP SEND jack, -10dB or +4dB?*

- While not exact, -10dB is a better approximation than +4dB. The actual output level will depend on your settings, particularly the volume controls. +4dB is usually reserved for recording/P.A. equipment with balanced connections.