

**THERMIONIC**

**CULTURE**

**THE ULTRA VULTURE**



**OPERATING MANUAL**



# WARNING

For your personal safety, please read this operating manual and this warning thoroughly before using the equipment.

This unit must be installed in such a manner that operator access to the mains plug is maintained. Where the product is to be rack mounted, this may be achieved by having access to the disconnection device for the whole rack.

To reduce the risk of electric shock, it is essential that the unit is disconnected from the mains supply before removing the cover.

Please also note that the power supply capacitors within this unit can remain charged even after the mains supply has been disconnected. It is essential that these capacitors are discharged after the mains supply has been disconnected and the covers have been removed.

In the event that this unit has been dropped or has suffered an impact, an electrical safety test must be carried out before reconnection to the mains supply.

This equipment is not intended for use in explosion hazard environments. It must be used and stored in studio conditions, such that the ambient relative humidity does not exceed 80%, nor is the temperature to be allowed to drop to a level, which would cause dew point to be reached.

The Ultra Vulture, though valve based, does not run exceptionally hot. Other equipment can be mounted in the rack directly above and below it, as long as the rack is well ventilated and the ventilation slots are not obstructed.

It is not advisable to operate this equipment unless all valves, especially the Output valve in the centre, are in place.

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## 1 Introduction

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The Culture Vulture is universally renowned as the first and only all valve unit, dedicated to producing the best harmonic distortion money can buy.

THE ULTRA VULTURE takes the Culture Vulture to a new level making it more suitable for accurate stereo uses, including mastering, where extended frequency response, low noise and re-callability are of prime importance. Transformer balanced line ins and outs are standard, on XLR connectors.

Although the unit can be "clean" (less than 0.2% THD), added valve saturation may be quite desirable, improving naturality and smoothing off unwanted digital spikes. But The Culture Vulture can be used for distortion effects! Push it and try it!

The user has total control over the type and amount of distortion, which can be changed from even to odd harmonics or a combination of both. Starved, the sound from The Vulture becomes thin and loses its body, overfed, it becomes fatter.

The Function switch now has 2 "effects" positions, 'P2' & 'P3'.

The extra '+10dB' drive position gives some of the bite of 'Overdrive' but with far less noise. When '+10dB' is selected (only) the 'Presence' switch is available. The '-10db' output switch allows the unit to be driven into extreme distortion but still have an easily achieved stereo balance. However, the 'P2' and 'P3' positions will become so extreme that true stereo won't always be applicable.

All pots, except 'Bias', are indented for easy recall. Use meter readings to accurately recall 'Bias' settings.

A test report comes with each unit indicating best settings for mastering.

## **2 Controls & Meters**

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### **2.1 Drive**

This control is really in 2 parts, a switch and a rotary pot. The switch gives a coarse control and the pot a fine control of the signal input level. At the first position 'Normal' (for line level signals) the frequency response is flat. The '+10' position increases the gain by 10dB and adds some top end for extra bite. 'Overdrive' is 30dB above 'Normal' and can be used for extreme distortion effects at line level, also guitars and other low-level sources.

The 'Drive' pot controls the amount of signal you are feeding to the 2<sup>nd</sup> valve, so the higher it's set the more effect. It should be used in conjunction with the 'Output Level' control to keep overall levels where they are desired.

### **2.2 Output Level**

Again, this control is in 2 parts, a switch (-10dB) and a rotary control. This controls the signal going to the output valve. Usually, it's advisable to set the rotary control at 8-12 (check test report) with the '-10dB' switch down for low distortion at line level. Set the switch to '-10dB' and reduce the rotary control when pushing the distortion valve at other than P3, which always requires maximum 'Output level'.

### **2.3 Bias (and meter use)**

This control varies the current through V2 by changing the positive voltage on its cathode. The actual current is shown on the milliammeter. When the Vulture is starved of current the sound is thinner and when over-fed it becomes fatter, but current above 0.6 mA will shorten valve life. The best setting for low distortion is usually 0.25 - 0.3 mA (see test report for exact figures with valves supplied).

When the Vulture is being pushed into heavy distortion the meters will twitch.

**N.B.** The 'Bias' pot is naturally noisy in operation as all of the valve's current is flowing through it, but it should be silent when set

## **2.4 Function Switch**

'T' and 'P1' positions mean that V2 is configured as a triode (even harmonics) or a pentode (odd harmonics).

'P2' is an exciting new discovery. It will sound quite clean until overload is close when lots of harmonics are suddenly added, and at higher levels over-compression will occur and dynamics are inverted

'P3' is a very distorted sort of pentode. Rectifying effects can be obtained when lowering the 'Bias' and this can result in what sounds like the pitch changing up an octave to the ear.

## **2.5 Filter**

This is a low pass filter cutting frequencies above 5 kHz by up to 6 dB, reducing "harshness".

## **2.6 Presence**

This switch operates only on '+10dB' gain. It broadly boosts mid to high frequencies by up to 4 dB.

## **2.7 Bypass**

This switch links the Line input to Line output directly, cutting out the electronics of the ULTRA Vulture. It does not function when using DI input or Output Lo jacks.

### 3 General Operational Hints

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When just "warming" the sound use 'T' or 'P1' settings with output level control at 8-10. Turn down the control as you increase input level and/or increase V2 current settings. Turn to max for 'P3' applications.

The "cleanest" setting for the "Bias is usually 0.22 to 0.32mA and 'T' function, this should be used to give sounds just a bit more 'naturalty'. Check test report.

A good setting to simulate analogue tape distortion is 'T', normal drive, meter set to 0.3-0.4 mA.

A generally popular setting is 'P' 0.4mA with 'Output' level reduced accordingly.

When used with low amounts of drive these settings can appear to enhance the warmth and size of the audio and can be used to reduce unwanted transient peaks, much like a limiter, resulting in a louder sounding output.

On the 'P2' & 'P3' settings, a characteristic of the type of valve used is that a frequency doubling effect can occur when distortion sets in, due to waveform rectification. This can be quite interesting and is most likely to occur with high 'Bias' (around 0.1-0.2 mA current).

Use the '+10' setting of the 'Drive' switch if you want a little more 'bite' or brightness. There may be sufficient gain to use this setting for some electric guitars when DI'd, if a low 'Bias' (high current thru V2) is used. Otherwise, use the 'Overdrive' setting when DI-ing guitars. Of course, you can chain the 2 channels together, using 'Overdrive' on the first for extreme effects.

Use the 'Filter' switch to reduce unpleasant upper harmonics, especially useful when using 'P2' & 'P3' effects.

If using the unit across a stereo mix or group, then ensure that you set it up with both meters reading the same rather than relying on knob positions. You can only expect an unchanged stereo picture when the 'Function' switch is set to 'T' or 'P1' positions. Little chance on 'P2' & 'P3' position but that may not necessarily be undesirable.

**N.B.**, You may find that to obtain a perfect stereo balance in both T and P1 settings, you may need to set Drive levels so that the 2 sides read slightly differently. This is quite normal and is due to component tolerances.



## 4 Inputs & Outputs

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Inputs and outputs are connected as follows:

Line ins and outs are on XLRs with signal pins 2 & 3. Pin 1 ground.

Low level outs are also TRS jacks with Tip as output. Ring and Sleeve are grounded so can be used with “balanced” cables.

The DI inputs on the front are mono (TS jacks). **NB.** The DI input overrides the Line input.

All jacks are gold plated for best connectivity.

Always use twin screened “balanced” cable when connecting line inputs and outputs. There should be no problem whatsoever when connecting line inputs and outputs into balanced or unbalanced systems.

The ULTRA Vulture is designed to work into equipment with an input impedance of at least 4kΩ. Nearly all equipment currently sold meets this requirement, though certain units still have 600 Ohm line inputs. If you plug into one of these there will be a loss of both level and low bass frequencies.

## 5 Servicing & Maintenance

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### 5.1 Valves

The unit comes with a 12 month warranty covering all parts, including valves, and it is essential that it is returned to our factory or to the dealer from which it was purchased for repairs to be carried out otherwise the warranty is invalidated. There is, however, one important exception to this rule:

Valves are quite delicate items and the most common cause of failure, despite our choice of highest quality ones. If a fault occurs on one channel, a valve is quite likely to be the cause, so if you feel confident and willing to do the following, here's the procedure:

Unplug the power and remove the top by undoing screws which attach it. Note: 1 screw is silver and must be replaced in the same place. The unit can be powered up safely without the top on provided that the screening plate above the circuit board is not removed and reasonable care is taken not to touch exposed connections, but don't change valves with the power on! Change over the 2 input valves. These are the ones with metal screening cans nearest the left & right sides. If you press down a little and twist the can anti-clockwise it will come off, then gently pull out the valve. Be careful when replacing valves that the pins line up. Do not bend them! Plug back in and see if the fault has changed sides, if not try changing the next pair inwards (the "distortion" valve). Be sure not to mix up the valves as they are different types and have different pin connections!

The valve in the centre is the output valve and is a double triode common to both channels. This is very robust – the type 5963 has top marks for reliability. If you want to be sure, you can replace it with the common ECC82 (12AU7)

with very slightly degraded results. Spares can be obtained from Thermionic Culture Ltd.

Input valves can be replaced individually but “distortion” valves should be replaced in matched pairs if you use the unit for stereo. (otherwise it can be quite fun to have different sounds from each side – some of our old customers prefer it!)

Valve complement: (equivalents in brackets, nearest 1<sup>st</sup>)

Input            2 x 5654 (M8100, CV 4010, EF95)  
Distortion      2 x 5725 (6AS6W, CV 4011, 6AS6)  
Output -        1 x 5963 (ECC802S, 6189, ECC82, 12AU7)

## **5.2 Operating voltage / Fuse**

The ULTRA Vulture is switch selectable to operate from either 230V or 115V 50/60Hz AC mains supply.

NOTE: Mains fuses may be replaced in accordance with the following table:

Operating Voltage	Fuse Rating
115V	T500mA 20mm type
230V	T250mA 20mm type

## 6 Specification

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A) Figures obtained with 1kHz signal, 0.25mA 'Bias' current, Function at T, feeding a 10k $\Omega$  load.

Distortion (THD): 0.2%  
Frequency response: 20 Hz to 25 kHz, +/-1dB

Max Output Level (MOL) +19 dBm, 2% distortion

Gain available: 46dB line, 52dB DI input  
Noise: 90 dB below MOL (2%)

B) Maximum Figures

Distortion (THD): 98%  
MOL: +24 dBm, 20%+ distortion  
Gain: 70dB (approx), P1, min. 'Bias'.

C) Impedances:

Line Input: 20k $\Omega$   
DI Input: 50k $\Omega$   
Line Output 1k $\Omega$   
Lo Output 4k $\Omega$

D) Power Consumption: 20W

E) Net Weight: 6 kg

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