THERMIONIC CULTURE

THE LITTLE BUSTARD

valve mixer

OPERATING MANUAL

WARNING

For your personal safety, please read this operating manual and 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.

It is not advisable to operate this equipment if all valves are not in place and working, as voltages will rise and components may overheat and fail.

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1 Introduction

The Little Bustard is Thermionic Culture's second passive summing product. It was initially intended as an extension unit to the Fat Bustard but it functions equally well as a stand-alone summing mixer.

The front panel is less complex than the Fat Bustard and it is intentional that the unit is simpler to operate and also that the unit offers less colouration to the summed signals. The valve warmth and detail of analogue summing in this unit is very much there but the distortion and phase shift are kept to an absolute minimum. This is partly down to the choice of E86C valves in the output stage, giving a very clean result at normal output levels. We feel that as an extension to the Fat Bustard this is essential plus the unit can offer a quite different flavour as a summing unit in its own right.

The Little Bustard can sum 16 individual channels together. 12 channels are in stereo pair format and 4 channels are either mono or can be panned around the stereo mix as desired.
We have also provided some simple but unique indication of level at the stereo output by using multicoloured LEDs in the eyes of the Little Bustard icon. We hope this allows the user to get an idea of the stereo signal output level and amount of saturation at a glance.

When used as an extension to the Fat Bustard the Little Bustard's stereo outputs should be connected to the Auxiliary inputs of the Fat Bustard.

2 Controls

2.1 Channels 1 to 12

These channels come as fixed gain stereo pairs. Each pair of channels has an ***on/off*** switch. The switch cuts the signal from the mix bus when off and the signal is present at unity gain when the switch is on.

2.2 Channels 13 to 16

These channels have 4 controls each:-

On : This switch cuts the signal from the mix bus in the up 'off' position and passes the channel signal to the mix bus in the 'on' position.

Gain: The rotary gain control is located above the 'on' switch for each channel. It allows the channel signal to be attenuated continuously between an infinite amount '∞' or not attenuated at all '0'.

Mono/Pan in: This switch passes the channel signal equally to both sides of the mix bus in the up 'mono' position. In the down 'pan in' position it engages the pan pot, in this position the signal loses 6dB of gain to the mix bus when pan pot is set to centre. This is the same amount of gain loss found in nearly all mixers that have a pan on/off facility.

Pan: The pan pot offers continuous panning of the channel signal between hard left and hard right.

2.3 Master Level

These two matched 31 position indented pots provide the final master level control for the Little Bustard's mix bus. The pots can provide a gain range from -17dB below to +2dB above the nominal 0dB position.

3 The Eyes

The multicoloured LEDs situated in the Little Bustard icon's eyes provide a simple indication of level at the stereo output before the output level pots. The ranges shown are :

Yellow for signal present

Green for optimal signal level (-5 dBu to +7 dBu)

Red for high signal level (+8 dBu upwards)

Obviously, the higher the signal level goes, the more likely it is that there will be distortion and the associated second harmonics found in triode valve output stages at high levels. However, we have chosen not to make this a serious feature of the Little Bustard due to our choice of output valves. The Little Bustard stays remarkably distortion free provided that the input stages are not overloaded.

For cleanest results, keep the Master Level control fairly high and control your input levels (unless of course you want to add extra colouration and transient reduction to the signal).

4 Inputs & Outputs

All audio connectors are standard XLR type.

The Little Bustard, as the Fat Bustard, works on an unbalanced system.

The 16 input connectors are wired Pin 1 Earth, Pin 2 Signal ('hot') and Pin 3 Signal negative ('cold'). Pins 1 & 3 are connected by a small resistor, which means that the Little Bustard will accept outputs from electronically balanced sources (certain DAWs) without quality deterioration, as well as unbalanced and transformer balanced sources.

The output XLRs are wired Pin 2 Signal, pins 1 & 3 shorted to Earth.

5 Servicing & Maintenance

The unit comes with a 12 month warranty covering all parts, including valves. 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:

5.1 Valves

It is quite safe for the user to change the valves, but **the unit must not be operated without all valves plugged in**. If a fault occurs, it may be a valve, so **unplug the mains** and remove the top cover.

The two input valves are nearest the front panel and there is one for each channel. Similarly, the two output valves are at the rear.

You can swap the valves from side to side to isolate a fault. For optimum results, if valves are replaced, replace them in pairs or at least with valves from the same batch.

Valve complement:
Input - 2 x 7025/ECC83/12AX7LPS;
Output - 2 x E86C/EC86

5.2 Operating voltage / Fuse

The Little Bustard 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	T630mA 20mm type
230V	T315mA 20mm type

6 Specification

Input impedance:	10kΩ
Output impedance:	100Ω. Load impedance should be 10kΩ or greater.

Distortion and MOL specs are for a load of 10kΩ

Distortion: (THD, unweighted, 30kHz filter)	<0.015% @ +4dBu
Maximum o/p level: (MOL @ 1% distortion)	+18dBU
Noise (30kHz filter):	94dB below MOL
Frequency response	
+0/-0.5dB:	12Hz to 45kHz
+0/-1dB:	9Hz 65kHz
Phase shift @10kHz:	2.7% (9.7°)
Crosstalk:	Zero, provided unused inputs are muted.

Thermionic Culture Ltd., Harlow, Essex, UK
Tel: +44 (0)1279 414770 Fax: +44 (0)1279 412233