THERMIONIC CULTURE

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 covers.

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 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.

Please ensure that adequate ventilation is provided and that the ventilation slots are not obstructed. When rack mounting this equipment a space of 1U should be left above it for air flow, and/or a fan may be required to provide sufficient airflow to dissipate the heat of the valves and not affect any equipment mounted above it .

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 Nightingale 2 is an improved version of the original Nightingale.
It now incorporates a useful eq bypass switch for comparison purposes in Input channels A & B. There is also a Standby switch which when activated reduces the high tension voltage to all of the valves. Use of this will prolong valve life and should be used when first switching on and at any time that the unit is standing idle with mains supply on.

The Nightingale 2 comes in exactly the same 4U ½ rack format with detachable power supply and can be used either stand-alone due to its robust construction, or mounted in a standard 19 inch rack using our rack mount kit. It can be on its own or share the space with another unit in this range.

The Nightingale uniquely comprises 3 different components. There are 2 (A and B) mic. / line preamps which also have EQ, filters, phase adjustment, 48V phantom power and a front panel DI input.

There is one mono compressor that is a modified version of the Phoenix, one of Thermionic Culture's oldest and most popular designs.

We have provided front panel switching to allow the user to configure the Nightingale 2 in different modes. The components can all be used separately or they can be linked and summed together internally via the front panel control.

Each preamp has a transformer balanced input, transformer-less unbalanced output and uses 1 valve per channel. The valve is an ECC832. The valves are run in a single ended configuration, which we feel gives a good balance between smoothness, clarity and harmonic distortion.

The EQ circuit is an active design, which is similar in operation to that found in the Earlybird 2 mic. preamps.

The mono compressor is a variation of the Phoenix design, which uses a different input transformer and valve complement. There is a different detector valve (5726), compression valve (6AQ8) and output valve (5965). This gives a harder type of compression curve, which starts at less than 2:1 and ends up as a 20:1 ratio at high compression levels. The combination of new valves and transformers also gives the unit more available gain. We find that these qualities suit what this unit as a whole is capable of.

We feel that The Nightingale 2 is a very versatile and unique unit. The ability to take 2 different signals from DI, mic. or line sources then be able to EQ, compress and internally sum them together whilst retaining the ability to use all 3 components individually, or any combination in between, is a very creative combination of features that can't be found in any other single unit of this size.

The quality of the circuit design means that the sound of the unit stays open and natural even when applying extreme amounts of processing. Full use of all the features can be made without fear of seriously damaging the signal quality.

It was originally made for Live use where 2 vocal mics may be combined, each with its own eq,, into 1 "soft knee"" compressor, with phase reversal on one mic to reduce band pick-up.

2 Installation / Starting up

The Nightingale 2 can be operated in almost any environment, for studio or live use.

We supply on request a special Rack, capable of holding 2 units.

If 2 units are rack-mounted with other equipment above them, we strongly advise that a gap of 1 U is left above so that heat can dissipate, and/or use a fan.

When used in a rack, the power supply can be detached, moved further back and re-connected using a special cable. This is certainly not essential, but can reduce the low frequency hum by up to 2 dB.
We are considering producing an external PSU capable of powering up to 6 units. Please contact us if this interests you.

All connectors, except DIs, are standard XLRs with pin 1 ground and pins 2 & 3 Line (pin 2 “hot”).
Connections to other equipment should be made using standard twin screened cables.
Cable length should not be an issue, within reason.

DI inputs are unbalanced jacks so cables must be shorter, and we recommend 3 m max unless the source impedance is low as with most synthesisers, but beware of “hum loops”.

Before switching on check that the mains selector is set for your local supply.230 for 220-240v, 115 for 110-120v. We factory set these for the ordered destination, but if it’s set incorrectly you may need to change the fuse. Your local dealer should carry spares. See table at end of manual.

Now check that the Standby switch is set in the Standby position. Use the Standby facility when switching on from cold and if the unit is powered up but not actually in use.

This will prolong valve life and keep heat and power consumption lower.

Switch on. The power switch is at the rear under the mains inlet. The compression meter will rise to about ½ way. Now switch out Standby and the meter will go to 0. If it ends up not quite vertical, use the adjustment tool provided to set to 0 using the zero adjust facility on the back. It will drift a little with mains supply variations. It's not critical that the meter reads exactly zero (with no signal) as it's just an indication of the compression.

Do not adjust the little screw on the front of the meter. This just changes the angle of the needle when the unit is cold, when it should be horizontal.

If you are using 1 or 2 microphones that require **Phantom Power**, switch on the 48v switch on the front panel. This is activated by pulling on it before switching down. It applies 48v to both mic channels but power is disabled when the input selector is in Line mode on the individual channel.

You are now ready to go, so **read the next sections!**

3 Controls and Operation - Preamp A and B

3.1 Input Level

This 3 way switch at the top of each preamp section allows the user to run the preamp as a Line input, Hi mic. level input or Lo mic. level input.

3.2 Gain

The rotary gain control is located at the top of each preamp section. It allows the channel signal to be attenuated at the input continuously. This gives a channel gain between:-

-∞ to + 5 dB gain for the Line amp
-∞ to + 21 dB gain for the Hi mic. setting
-∞ to + 34 dB gain for the Lo mic. setting

3.3 Top

The rotary control allows the amount of top lift EQ to be continuously adjusted between 0 and +12 dB. The EQ starts as a gentle type curve and it reaches it's peak at 9.5 kHz.

3.4 Pres

The rotary control allows the amount of mid lift EQ to be continuously adjusted from 0 to +11dB with a very broad curve peaking at 2.8kHz.

3.5 Bass

The rotary control allows the amount of bass lift EQ to be continuously adjusted between 0 and +11 dB. The EQ has a 'varislope' type curve which is initially very broad, reaching a small peak at 90Hz at a position of '5' and then reaches it's final peak at 40Hz when the control is turned on full.

3.6 Top Cut

The 3 position top cut switch gives 2 choices of filter at high frequencies:-

Position 1 gives a flat response with no filter in circuit.
Position 2 gives a low pass filter 6dB down at 8 kHz
Position 3 gives a shelving type cut flattening out 8dB down at 8 kHz

3.7 Phase

The phase switch is a 2 position switch and allows the user to change the phase of the channel signal by 180º

3.8 Bass Cut

The bass cut switch is a 3 position switch which gives 2 choices of shelving filter at low frequencies. The shelving filters are shallow types of bass cut and are designed to interact with the bass lift to make a simultaneous low mid cut and low bass lift possible.
Position 1 gives a flat response
Position 2 gives a shelving filter with a 3dB cut at 200Hz down to 7dB at 80 Hz
Position 3 gives a shelving fliter with a 3dB cut at 800Hz down to 6dB at 200Hz.

3.9 HPF

The high pass filter switch gives the user a filter which is 6dB down at either 30Hz or 80Hz and becomes more severe as the frequency drops.

These frequencies and filter slope work very well in conjunction with the Bass control. Effectively allowing the user to simply remove problem frequencies from a sound or to allow the bass frequencies to be dramatically enhanced without any danger of

producing sub bass frequencies that interfere with the action of loudspeakers.

3.10 EQ Bypass

This switch cuts out all eqs and enables the user to compare their effect.

4 Controls and Operation - I/P Select

The 4 position 'I/P select' switch controls the most unique feature of the Nightingale.

With 'I/P select' set to 'Line' the input to the compressor is taken from the 'comp in' XLR socket located on the back of the Nightingale.

With 'I/P select' set to 'A' the input to the compressor is taken internally within the unit from the output of preamp A. The preamp can be working at any setting and its signal will be sent to the compressor.

The preamp signal will also continue to be sent to the 'preamp A output' XLR plug found on the back of the Nightingale.

With 'I/P select' set to 'B' the input to the compressor is taken from preamp B. This works exactly as described for preamp A above.

With 'I/P select' set to 'A+B' the compressor takes its input from an internally summed combination of outputs from preamps A and B.

The mix between the 2 preamps can be adjusted by changing their input gain settings. The 2 preamps can be set in any configuration of mic, line or DI input. The signals from the 2 preamps will still be sent to their respective XLR output plugs. This makes it possible to use the unit for the following:

a) Individual use of 2 preamps and one compressor.;
b) One preamp plus compression and one preamp with no compression;.
c) Summing any combination of 2 mic. , DI & line signals;
d) Recording 'clean' un-summed or compressed versions of each preamp signal simultaneously to the processed signal.;
e) Parallel processing.;
f) Extra mic. / DI signal gain.

5 Controls and Operation - Compressor

5.1 Meter

This meter has the same function as the meters in a standard Phoenix compressor. It allows the user to read the amount of compression applied to the signal in dBs. The ballistics of the meter are slower in action than the actual compression in order for the user to more easily see what level of compression is being applied.

5.2 Threshold

This 4 way switch gives the user control over the signal level at which compression begins. The 4 positions go from 'off' (no compression applied), through 1,2 and 3. The position 3 is maximum threshold and would be the equivalent of a setting of '1' on the standard Phoenix. This gives maximum possible compression.

5.3 Release

This 3 way switch controls the speed of recovery from compression. The equivalent settings on a standard Phoenix would be:-

Position F – setting of '1' - 60ms
Position M – setting of '3' - 150ms
Position S – setting of '7' - 500ms

It’s worth noting in this section that this compressor has a fixed attack time.

This attack time is set at around the equivalent of a setting of '4' on a standard Phoenix which gives a time figure of 60ms.

5.4 Comp Gain

This rotary indented control provides the adjustment needed to the input gain of the compressor. This version of the Phoenix circuit gives slightly more gain (28 dB) than that found in the standard Phoenix (26dB). This comes in useful when more gain may be needed with a low mic. input signal level. The mic. pre-amp may be sent to the compressor with the I/P select switch and the compressor will add gain to the mic. preamp giving a total gain of almost 60dB (3dB less . in A+B mode).

5.5 O/P Level

This 5 way switch gives control over the final output level of the compressor.

It acts as an attenuator at the final output of the unit. So the cleanest signal possible can be obtained with the switch set to 'MAX'. This gives zero signal attenuation. The steps '3 , 2 , 1 and MIN' give progressively more attenuation (about 3.5 dB per step) to the output signal should it be required.

6 Operational Hints

You may find that the Nightingale can allow you to try any combination of preamp, EQ and compression very quickly. The following situations are some examples of where the Nightingale is well suited to the task.

1) Snare drums and toms are often recorded with top and bottom mics. This can result in many tracks getting recorded which can clutter up a multitrack recording, especially when working on tape or with limited numbers of A/D converters. The Nightingale can be used with preamp A&B summed to the compressor to present the user with a combined single track, which may be compressed if desired. Don't forget to use the phase switch on the preamp for the underneath mic. to reverse the phase!

2) A guitar amp, acoustic guitar or vocal is often mic'd with 2 mics for a combination of their sound qualities. This can be EQ'd, summed and compressed on the spot. The individual mics can still be recorded for safety.

3) It's possible to record an instrument direct to multitrack via one preamp and then combine the direct mic. with an ambient mic, compressed heavily onto another track. Panning these signals gives an unusual stereo effect where the ambience is never overpowering the direct sound.

4) During mixing the Nightingale may be used to take 2 line signals which may be EQ'd and compressed together. The output from the pre- amps and compressor can be used in parallel to make the most use out of the extreme compression available in the unit.

5) A dynamic. signal that also has some ambience may be fed into both preamps of the Nightingale. One preamp may be put out of phase with the other and then both can be summed into the compressor. Use of EQ can cause differences between the signals to cause less than 180º perfect cancellation, which can be compressed and this can bring out some new dimensions to the existing sound.

6) In a Live situation where there are 2 vocalists The Nightingale will blend the 2 together making them sound warmer yet clearer and more cohesive. It improves the PA sound. As soon as 1 vocalist starts singing the level of the other mic. falls as well giving better separation and therefore a cleaner band sound.

7 Servicing / Valves / Tubes

In the unlikely event of a fault contact your local Authorised Dealer or Thermionic Culture Ltd.

All Valves are guaranteed for 12 months but they tend to be the most likely cause of any problems.

The valves are:-

Pre Amp

1 x 12DW7 (ECC 832) per channel.

Compressor

1 x 6AQ8
1 x 5726 (6AL5)
1 x 5965

If the unit is under warranty, do not remove any covers without express permission from Thermionic Culture Ltd – otherwise the warranty will be invalidated

8 Specification

	Preamps A & B	Compressor
Input Impedance		
Mic Lo	600Ω	N/A
Mic Hi	1200Ω	N/A
Line	10kΩ	10kΩ
Output Impedance	<400Ω	<600
MOL (into 10kΩ)	+26dBu	+26dBu
Distortion (1kHz)	0.1%	0.02% *
Frequency Response +0/-1 dB	<10-35kHz	13-80kHz
Total Noise (unweighted 30kHz filter) below MOL	103dB	105dB
Max Gain	34dB	28dB
Phantom Power	+48V	N/A

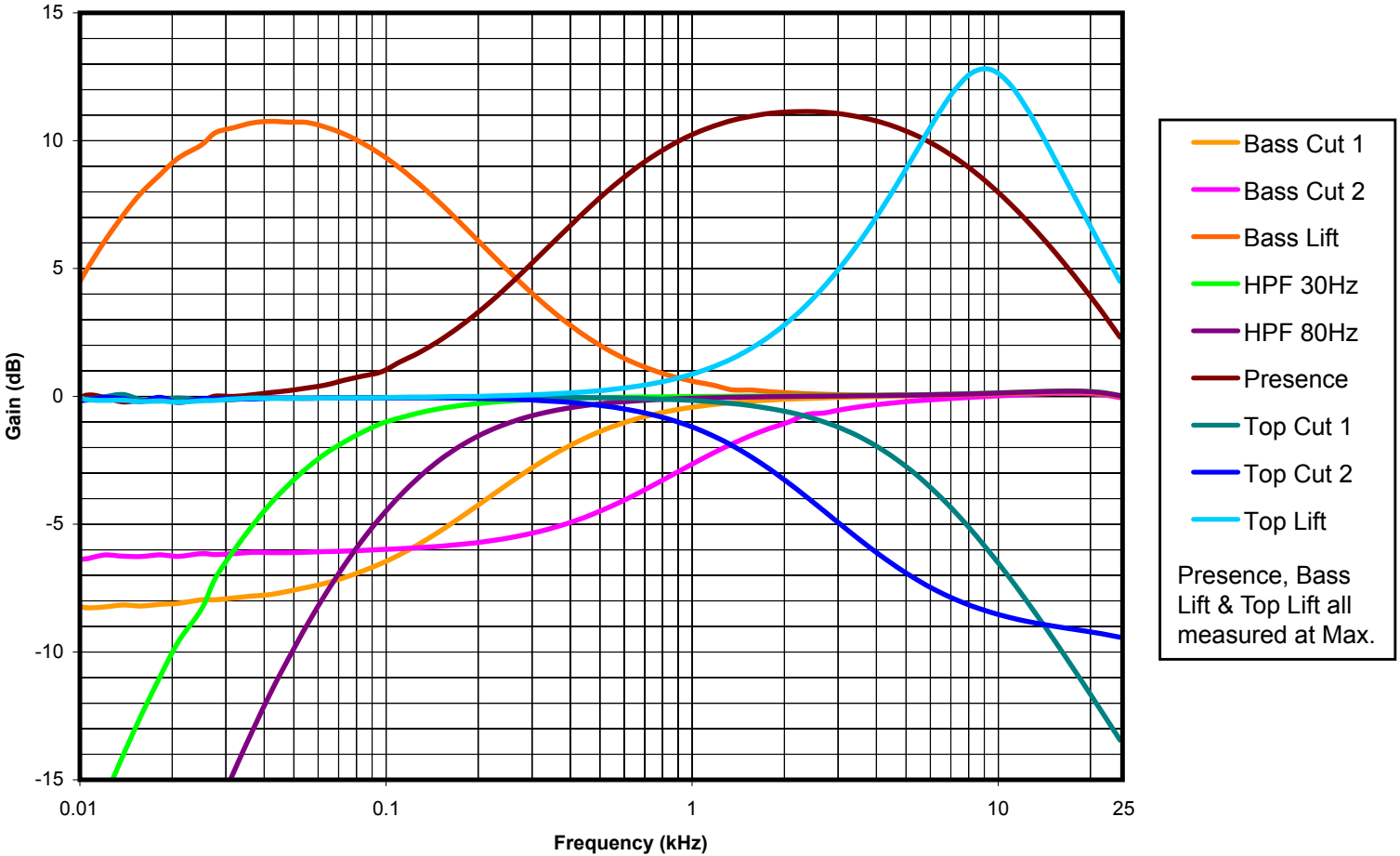
* Increases with compression to a typical figure of 0.2% with 6dB compression.

The Nightingale can be set to operate from either 230V or 115V 50/60 Hz AC. The appropriate mains input voltage can be selected on the red switch located next to the mains inlet.

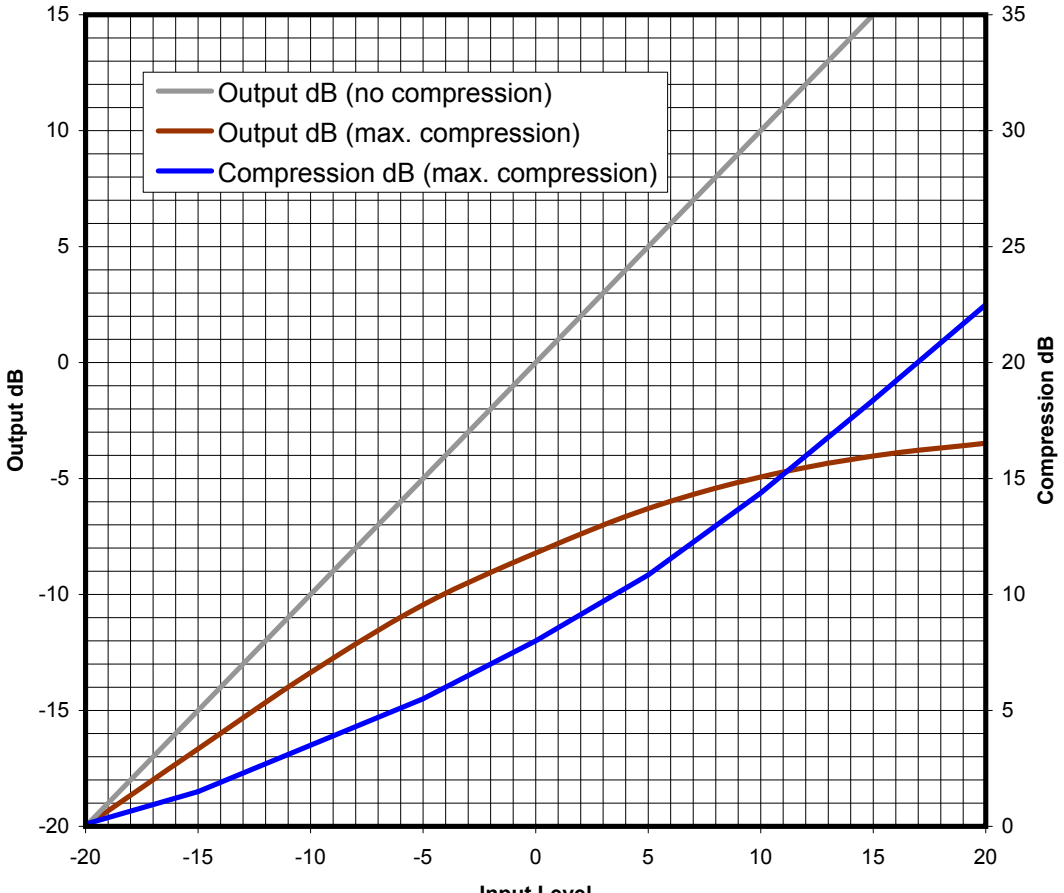
Note: Mains fuses must be replaced in accordance with the following table.

Mains Voltage	Fuse Rating
230V	T315mA
115V	T630mA

The Nightingale - Frequency Response Curves



The Nightingale - Compression



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