

# The Phantom Power Box

A precision 48 Volt microphone phantom power supply

Exceeds the requirements of DIN 45596

This transformerless design complements the Balance Box but enables any microphone amplifier (with or without a transformer coupled input) to be converted to P48 standard phantom power. Line balance is accurately defined to ensure common mode interference rejection is not degraded, an important feature when phantom powering remotely from the microphone amplifier. Full protection is provided against line shorts or the plugging in of microphones damaging the microphone amplifier input with large voltage transients.

Close tolerance components (0.1%) provide matched DC feeds to the microphone leads and a low noise 48 Volt supply ensures noise performance is not compromised. A low impedance DC isolated output allows moderately long signal lines to be driven to the microphone amplifier without deterioration in frequency response or line balance. This enables the phantom powering to be applied close to the microphone avoiding long lines carrying 48 Volts with the risk of losses and microphonic effects in the cable. A switchable 20 dB attenuator is provided to take into account the higher signal levels produced by many professional condenser microphones. Some microphones have the facility of operating from an internal single cell battery, but used in this way dynamic range is severely affected.



An extremely compact high efficiency step-up switching converter gives exceptional battery life from a single PP3. Provision is made for the connection of an external supply should this be required. Great care has been taken to avoid induction of switching products onto the signal lines and external electromagnetic radiation is minimised by thorough screening.

## Connection to balanced microphone amplifiers

To connect to the Balance Box, or any other balanced microphone amplifier, the output of the Phantom Power Box is connected directly to the amplifier input with both signal lines, together with the screen. The microphone is similarly connected to the input of the power unit with both signal lines and screen. Use only high quality cable for the microphone lead.

With the Balance Box a balanced or unbalanced line output can be obtained without disturbing the balance of the microphone lines. With both phantom powering and amplification being performed close to the microphone maximum protection against interference is obtained.

## Connection to unbalanced microphone amplifiers

Powering must always be provided through both microphone modulation leads and neither should ever be connected to ground at the input to the Phantom Power Box. The DC isolated output of the Phantom Power Box may be connected to an unbalanced microphone amplifier by either grounding or floating the unused signal lead (usually pin 3, with pin 2 the in phase signal) depending on the design of the microphone in use. Check the manual supplied with the microphone for the recommended method in any particular application.

Because of their interference suppression properties balanced lines should always be used in professional installations.

To minimise inevitable switch on and off disturbances when using phantom powering ensure the following microphone amplifier is always switched off before turning the phantom power unit on or off, or when connecting or disconnecting a microphone.

## Performance Specification

When terminated with 1 - 2 kOhm microphone amplifier input impedance

Frequency Response	+/- 0.25 dB from 20 Hz to 20 kHz
Noise	<-140 dBu from 10 Hz to 20 kHz (Note 1) <-100 dBu from 10 kHz to 1 MHz
Distortion	<0.005% from 20 Hz to 20 kHz
Gain	0 dB; -20 dB (+/- 0.5dB)
Input Clipping Level	-4 dBu; +16dBu
Input Impedance	2 kOhms - for 100 Ohm to 600 Ohm microphones
DC power feed matching	Better than 0.2%
Output impedance	<600 Ohms
Output Differential DC offset	<2 mVolts
Output Differential Line Balance	Better than 0.05%
Maximum Phantom Power Current	10 mA. (Short circuit protected)
Phantom Power Voltage	48 Volts +/- 0.5 Volts
Connectors	
Input	XLR 3 pin female
Output	XLR 3 pin male
Pin Connections	PIN 1 GROUND; PIN 2 SIGNAL; PIN 3 RETURN See text for unbalanced connections
PP3 Alkaline Battery Life	200 hours at 1 mA phantom power current
External DC Connector	2.5 mm. Centre pin positive (Note 2)
Dimensions	Width 80mm, Height 45mm, Depth 135mm
Weight	300 gm including battery

## Notes to Specification

1) Measurements of dBu are dB with respect to 0.775 Volts

2) The unit may be operated from an external supply between 6 Volts and 12 Volts DC (maximum) at 100 mA The recommended voltage is 9 Volts. The supply for each unit should be fully floating and regulated.

## Operating Controls

### Front Panel

Gain selection	Two position slide switch
Connectors	Microphone input and output

### Rear Panel

Battery Holder	PP3 externally accessible
Power on/off	Two position slide switch
Low battery warning	Red LED
Connector	External DC supply

On switch on the LED should illuminate for about half a second and go out. The LED lights longer the more discharged the battery until it remains on continuously, indicating the battery is no longer serviceable and should be changed. This is also true if the LED illuminates during use. If the LED fails to illuminate at all then the battery is completely discharged.

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