

# **T L Audio**

## **INDIGO SERIES**

*User Manual*

### **O-2031 VALVE OVERDRIVE**

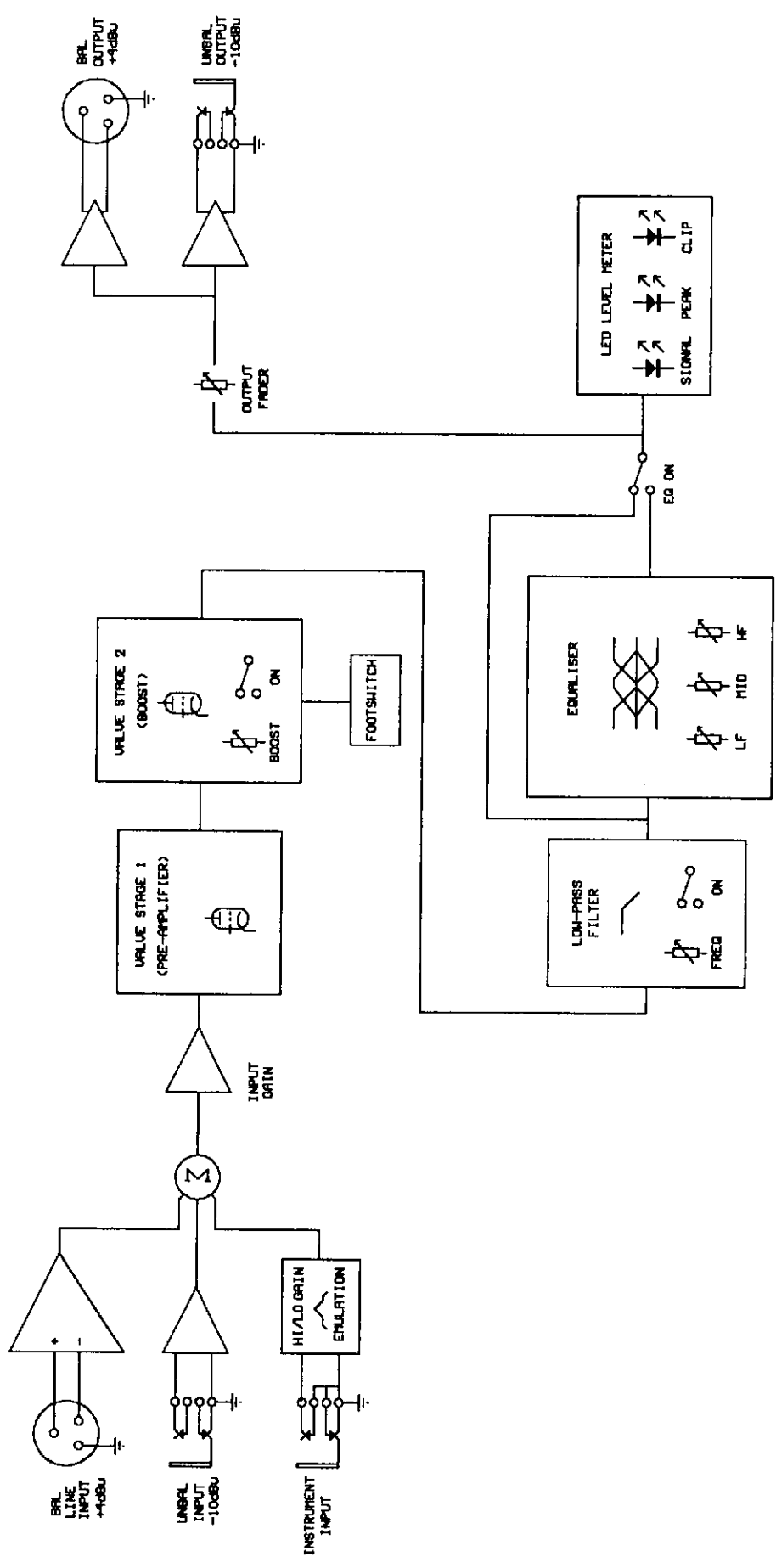
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FIG. 1: BLOCK DIAGRAM (ONE CHANNEL).



## INTRODUCTION

The T L Audio Indigo Series combines classic valve techniques with low noise solid state circuitry to produce audio processing units offering very high quality signal paths with comprehensive control facilities and the unique valve sound.

The O-2031 is a two channel valve processor which accepts a comprehensive range of balanced and unbalanced line and instrument input sources. Each channel comprises a valve pre-amplifier stage permanently configured in circuit, followed by a second, switchable and fully variable boost stage to add valve character to the sound source. The instrument inputs also feature speaker emulation. A switchable 3 band stereo equaliser and a variable low-pass filter complete the facilities. Applications include pre-amplification during recording or live performance, and use as a stereo line level processor during mastering.

The block diagram of one channel of the unit is shown in fig.1. It has three input sources - a balanced line level input via an XLR connector, an unbalanced line level input via a jack socket, and an instrument input also on an unbalanced jack socket but located on the front panel where it provides a convenient means of patching a guitar or keyboard directly into the Overdrive. All three inputs may be used simultaneously. The gain of the input stages is controlled by a centre-detented control, calibrated for 0dB nominal gain from the line input sources at the centre and providing +/-20dB of variation. The instrument input has a sensitivity switch associated with it, to match the gain to a low level pickup (e.g. a passive guitar or microphone) or a higher output source such as a keyboard or active guitar, followed by the 40dB variation of the input gain control. In the high gain setting, speaker emulation is added to the response of the instrument input.

The first valve stage is configured as a pre-amplifier stage, adding subtle valve texture to the source. The second stage provides from 6 to 20dB of boost, to emphasise the valve circuit with a controllable degree of overdrive. This boost stage is switchable from the front panel of the unit, and may also be remotely controlled from a footswitch or console mounted switch.

When the boost stage is heavily overdriven, the harmonics added to the signal may be tailored by the switchable low-pass filter. The filter is second order, 12dB per octave, with a -3dB variable from 500Hz to 10KHz. Used in conjunction with the speaker emulation on the instrument input, controlled overdriven guitar sounds can be created.

The 3 band stereo equaliser may be separately selected to either or both channels. Used with the nominally flat response of the line inputs, the pre-amplifier and EQ can provide effective processing to a stereo signal prior to mastering or in a live mix.

Please read this manual fully before installing or operating the Valve Overdrive.

## PRECAUTIONS

The T L Audio O-2031 Valve Overdrive requires very little installation, but like all electrical equipment, care must be taken to ensure reliable, safe operation. The following points should always be observed:

- All mains wiring should be installed and checked by a qualified electrician,
- Ensure the correct operating voltage is selected on the rear panel before connecting to the mains supply,
- Never operate the unit with any cover removed,
- Do not expose to rain or moisture, as this may present an electric shock hazard,
- Replace the fuse with the correct type and rating only.

**Warning: This equipment must be earthed.**

# INSTALLATION

## AC Mains Supply.

The unit is fitted with an internationally approved 3 pin IEC connector. A mating socket with power cord is provided with the unit, wired as follows:

Brown: Live.

Blue: Neutral.

Green/Yellow: Earth (Ground).

All mains wiring should be performed by a qualified electrician with all power switched off, and the earth connection must be used.

Before connecting the unit to the supply, check that the voltage selector switch on the rear panel is correctly set. The unit may be set for 115V (accepting voltages in the range 110V to 120V, 60Hz AC), or to 230V (for voltages in the range 220V to 240V, 50Hz AC). Adjustment to the operating voltage should be made by sliding the selector switch left or right with a small screwdriver until the desired voltage is displayed. The mains fuse required is 20mm anti-surge, 1AT rated at 250V. If it ever necessary to replace the fuse, only the same type and rating must be used. The power consumption of the equipment is 30VA.

**Warning:** attempted operation on the wrong voltage setting, or with an incorrect fuse, will invalidate the warranty.

## Audio Operating Level.

The unit is equipped with inputs and outputs suitable for connection to a wide variety of other audio equipment. Generally, the balanced XLR connections will be required for interfacing to other professional equipment, where the operating level (line-up level or nominal level) will be +4dBu, or about 1.2V rms. The unbalanced jack connectors are generally intended for interfacing to semi-professional equipment and have an operating level of -10dBu, or about 225mV rms.

The unit may be used to change between operating levels, for example by connecting the unbalanced output of a semi-pro mixing console to the Overdrive's unbalanced input, and taking the balanced output of the Overdrive to the balanced input of a tape machine at +4dBu. All inputs and outputs of the Overdrive may be used simultaneously if required. Balanced interconnection is always preferable to obtain the best headroom and noise rejection, but can only be used if the other equipment in the chain, e.g. the mixing console, also has provision for balanced connections.

### **Audio Inputs.**

Each channel has a female, 3 pin XLR connector, suitable for balanced or unbalanced line sources at a nominal level of +4dBu. The mating connector should be appropriately wired as follows for balanced or unbalanced operation:

Balanced inputs:

- Pin 1 = Ground (screen).
- Pin 2 = Signal Phase (also known as "+" or "hot").
- Pin 3 = Signal Non-Phase ("- or "cold").

Unbalanced inputs:

- Pin 1 = Ground (screen)
- Pin 2 = Signal Phase ("+" or "hot").
- Pin 3 = Signal Ground

When using unbalanced signals, the signal ground may be obtained by linking pins 1 and 3 in the mating XLR connector. If this connection is not made, a loss in level may result.

### **Unbalanced Line Inputs.**

An unbalanced line level input at a nominal level of -10dBu is also provided for each channel, on a 0.25" mono jack socket. The mating plugs should be wired as follows:

- Tip = Signal Phase ("+" or "hot").
- Screen = Ground.

### **Instrument Inputs.**

A 2 pin (mono) jack plug is required, which should be wired as follows:

- Tip = Signal Phase ("+" or "hot").
- Screen = Ground.

The auxiliary input is suitable for direct connection of instruments including guitars and keyboards. Good quality screened cable should be used, particularly for microphone or low level sources, to prevent hum or noise pickup.

### **Balanced Outputs.**

The output is via a balanced, 3 pin male XLR connector. The mating connector should be wired as follows:

- Pin 1 = Ground (screen),
- Pin 2 = Signal Phase (“+” or “hot”),
- Pin 3 = Signal Non-Phase (“-” or “cold”).

### **Unbalanced Outputs.**

An unbalanced line output is provided for each channel, on a 0.25” mono jack socket.

- Tip = Signal Phase (“+” or “hot”).
- Screen = Ground.

### **Footswitch.**

Boost mode may be externally engaged using a single pole normally open (make-to-boost), switch rated at 30V DC @ 0.1A. The control input is digitally switched, and does not carry an audio signal.

The external switch connector is a 0.25” mono jack socket.

- Tip = Signal.
- Screen = Ground.

### **Ventilation.**

The unit generates a small amount of heat internally. This heat should be allowed to dissipate by convection through the grills in the side panels and top cover, which must not be obstructed. Do not locate the unit where it will be subject to external heating, for example in the hot air flow from a power amplifier, or on a radiator.

The Overdrive may be free standing, or mounted in a standard 19” rack.

**Rear Panel.**

The rear panel connectors are identified in fig.3. Make sure that all settings, mains and audio connections have been made as described above before attempting to operate the equipment.



FIG 2: FRONT PANEL

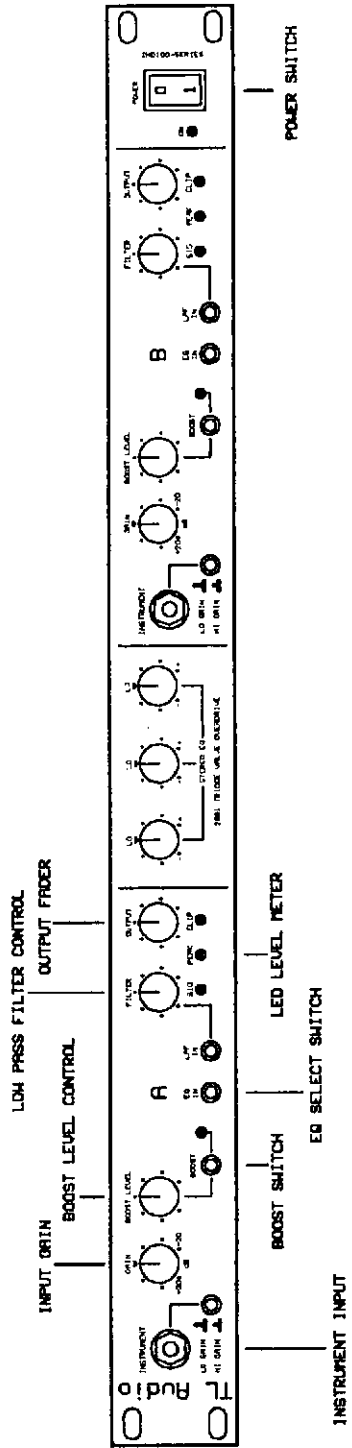
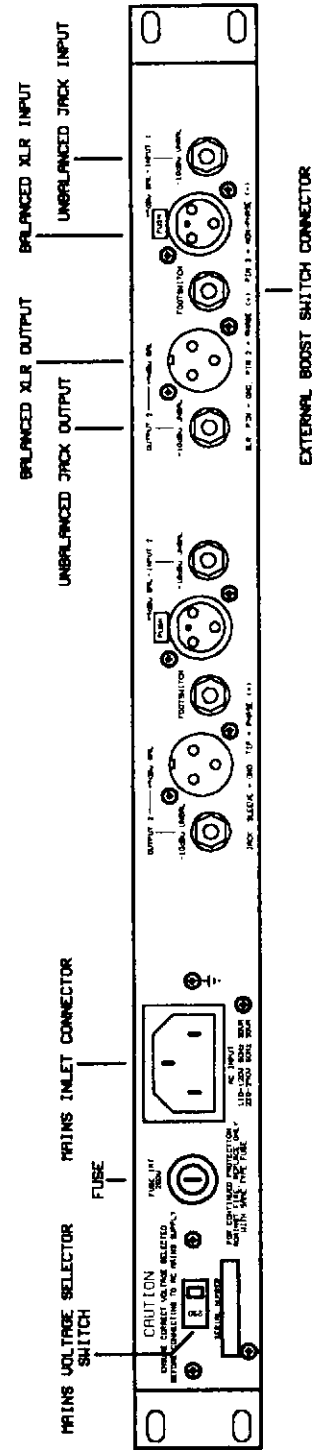


FIG 3: REAR PANEL



## OPERATION.

### Front Panel.

The front panel controls are identified in fig 2.

### Input Gain.

The input gain of the Overdrive may be varied over a range of  $\pm 20\text{dB}$ , which combined with the different sensitivity inputs, provides adequate and precise control of signal level. Generally, enough gain should be applied to illuminate the SIG (signal present) LED with the PEAK LED occasionally illuminating on loud transients. This will provide the optimum signal to noise ratio whilst maintaining a good margin of headroom.

The front panel auxiliary input sockets may be switched between high level signals ("LO GAIN", suitable for active guitars and keyboards) and low level signals ("HI GAIN", suitable for microphones, pick ups or passive guitars), and are also controlled by the input gain control.

### LED Indicators.

The 3 LED indicators display the operate level after the boost stage and equaliser, but pre the output master level control. The LEDs are illuminated at the following signal levels:

SIG (signal present):	-22dBu,
PEAK:	+10dBu,
CLIP:	+16dBu.

Note that by the nature of its design, the Overdrive progressively adds distortion as the signal level is increased. The maximum recommended operating level is +20dBu.

All of the above figures are relative to the balanced XLR output with the output control at maximum. The figures will be 14dB lower when using the unbalanced jack outputs.

### **Boost.**

The second valve stage is configured to provide from +6dB to +20dB of gain. The stage is selected either by engaging the front panel switch, or by making an external footswitch or console mounted switch. The orange LED illuminates when the boost stage is active.

The subjective effect of the valve stages in the Overdrive is heavily dependant upon the signal level in the valves, varying from subtle enhancement at low to medium level, with increasing harmonically-related distortion at higher drive levels. Thus the second stage may be switched into circuit to produce a boost in level as well as increasing the overdrive effect.

### **Low Pass Filter.**

The use of heavy overdrive to produce a sustain effect will also increase the higher order harmonics in the signal, which may give the impression of a high frequency edge or sharpness to the sound. The low pass filter may be engaged to limit the high frequency content, with a resultant mellowing of the sound.

Used in conjunction with the speaker emulation of the instrument input at high gain, traditional valve instrument amplifier effects may be produced.

### **Equaliser.**

The Overdrive features a 3 band stereo equaliser, with separate EQ-ON switches for each channel.

The bands have been optimised to enhance the valve circuitry, and have the following specification:

LF: +/-10dB at 80Hz, shelving,

MID: +/-10dB at 800Hz, peaking, Q = 1.

HF: +/-10dB at 5KHz, shelving.

### **Output Level.**

The output level control is a rotary fader. The gain within the Overdrive should be set to obtain the desired sound, and the output fader used to control the level sent to the following equipment. The setting of the output fader will not affect the valve character introduced by the Overdrive.

## SPECIFICATIONS

### Balanced Line Input:

Electronically balanced, unbalanced compatible, with input impedance greater than 5Kohm.  
Gain range -20dB to +20dB.  
Nominal input level +4dBu.  
Maximum input level +26dBu.  
3 pin female XLR connector.

### Unbalanced Input:

Input impedance greater than 5Kohm.  
Gain range -20dB to +20dB.  
Nominal input level -10dBu.  
Maximum input level +12dBu.  
2 pole 0.25" jack socket.

### Auxiliary Input:

Switchable for high or low gain, plus 40dB gain variation.  
Speaker Emulation frequency response at high gain setting.  
Maximum input level +18dBu.  
2 pole 0.25" jack socket.

### Boost:

+6dB to +20dB.  
Switched via front panel or external switch.  
Boost mode indicated by orange LED.

### Low Pass Filter:

Second order, 12dB per octave.  
-3dB point continuously variable from 500Hz to 10KHz.

**Equaliser:**

LF: +/-10dB at 80Hz, shelving.

MID: +/-10dB at 800Hz,  
Peaking response,  $Q = 1$ .

HF: +/-10dB at 5KHz, shelving.

**Output Level:**

Rotary Fader, 0dB at maximum.

**Balanced Outputs:**

Electronically balanced, unbalanced compatible.

Nominal level +4dBu.

Output impedance 47 ohms.

Maximum level +20dBu.

3 pin male XLR connector.

**Unbalanced Outputs:**

Output impedance 47 ohms.

Nominal level -10dBu.

Maximum level +14dBu into 10Kohms.

2 pole 0.25" jack socket.

**Frequency Response:**

10Hz to 20KHz, +0, -1dB.

**Noise:** -80dBu (22Hz - 22KHz).

**Distortion:**

Typically 0.3%, 20Hz to 20KHz at 0dBu, Gain 0dB with EQ in and flat.

**Dynamic Range:**

100dB.

**Power Requirements:**

Rear panel selectable for 220-240V 50Hz or 110-120V 60Hz operation.  
Rear panel fuse 20mm, 1AT, 250V.  
Power consumption 30VA typical.  
Detachable 3 pin IEC connector, mating connector and cable supplied.  
Front panel On/Off switch with green LED.

**Dimensions:**

19" rack mounting, 1U high.  
483mm wide x 44mm high x 250mm deep.

**Weight:** 4Kg.

The above specifications are subject to change without notice.

## SERVICE

Should the Overdrive require service, it should be taken or posted to an authorised dealer. Please retain the original packing for possible future use, and ensure the unit is suitably protected during transit. The manufacturer cannot accept responsibility for damage caused during transportation.

The Overdrive is supported by a limited warranty for a period of one year from the date of purchase. During this period, any faults due to defective materials or workmanship will be repaired free of charge. The warranty excludes damage caused by deliberate or accidental misuse, operation on the incorrect mains voltage, or without the correct type and value of fuse fitted. It is the user's responsibility to ensure fitness for purpose in any particular application. The warranty is limited to the original purchase price of the equipment, and excludes any consequential damage or loss.

Please retain proof of purchase, and send with the unit if claiming warranty repair.