

T L Audio

IVORY SERIES

User Manual

**5050 VALVE
PRE-AMPLIFIER / COMPRESSOR**

Tony Larking Professional Sales Limited,

Letchworth, England.

INTRODUCTION

The T L Audio Ivory Series consists of a range of hybrid valve signal processors, which utilise low noise solid state electronics in conjunction with classic valve circuitry to produce audio processing units offering very high quality signal paths with the unique valve audio character. The Ivory Series units offer comprehensive control facilities, whilst remaining straight-forward to operate, and represent excellent value for money.

The 5050 is a single channel pre-amplifier, accepting a wide range of inputs, coupled to a compressor with fully variable parameters. Twin LED bargraph meters display output level and gain reduction.

The block diagram of the unit is shown in fig.1. There are three input sources - balanced microphone via an XLR connector, balanced / unbalanced line input via a jack socket, and an instrument input also on a jack socket but located on the front panel where it provides a convenient means of patching a guitar or keyboard directly into the processor. The input stage is a hybrid valve circuit with gain controlled by a centre-detented control, calibrated for 0dB nominal gain from the line input sources at the centre and providing up to 60dB of microphone gain. The instrument input is also controlled by the input gain potentiometer, and will accept a wide range of sources from passive pickups to active guitars and keyboards.

The sidechain monitors the both the input (“feedforward”) and output (“feedback”) of the compression stage, and generates a control signal which varies the attenuation of the compressor. The sidechain processing includes fully variable control of the compressor threshold and ratio, plus switched time constants for attack and release. The circuit includes a “Hold” facility to reduce the distortion introduced when a very low frequency signal is heavily compressed with a short release time. The compressor section includes a dedicated gain reduction bargraph meter.

An independent gain make-up control is provided, to retain the subjective loudness of a compressed signal, plus an overall master output level control. The output control has a nominal 0dB of gain at its centre, with up to 15dB of further gain available to ensure full modulation of digital recorders.

The output is via an unbalanced jack socket at a nominal level of +4dBu. Metering of the output is by an 8 segment LED bargraph.

Please read this manual fully before installing or operating the Pre-Amplifier.

PRECAUTIONS

The T L Audio 5050 Pre-Amplifier 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 Pre-Amplifier is set for the correct mains voltage. The unit is internally set for 110-120V 60Hz or 220-240V 50Hz operation, and should only be changed by an authorised service centre. 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 20VA.

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

Audio Operating Level.

The Pre-Amplifier is equipped with inputs and outputs suitable for connection to a wide variety of other audio equipment. The line level input is via a TRS jack socket, and will support both balanced and unbalanced operation when correctly wired. The output is unbalanced, also via a jack socket.

Audio Inputs.

Microphone Input.

The microphone input is via 3 pin female XLR connector, suitable for balanced or unbalanced microphones. 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.

Line Input.

The line level input is via a TRS jack socket, suitable for balanced or unbalanced line sources at a nominal level of -10dBu or +4dBu. The mating connector should be appropriately wired as follows for balanced or unbalanced operation:

Balanced inputs:

- Screen = Ground (screen).
- Tip = Signal Phase (also known as “+” or “hot”).
- Ring = Signal Non-Phase (“-” or “cold”).

Unbalanced inputs:

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

When using unbalanced signals, the signal ground may be obtained by the ring and screen in the jack plug. If this connection is not made, a loss in level may result.

Instrument Input.

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

- Tip = Signal Phase (“+” or “hot”).

- Screen = Ground.

The 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.

Output.

An unbalanced line output is provided, on a 0.25" mono jack socket.

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

- Screen = Ground.

Mounting.

The Pre-Amplifier may be free standing, or mounted in a standard 19" rack. Always ensure that the cooling vents on the front and sides are clear of obstruction, and do not subject the unit to an external source of heat (by mounting immediately above a power amplifier, for example). If used free standing, ensure that the equipment is protected against rain and spillage of liquid.

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.

OPERATION.

Front Panel.

The front panel controls are identified in fig.2.

Input Selection.

The input source is selected by the push button adjacent to the input gain control. It selects either the mic XLR or line jack input. If a connector is plugged into the instrument input, it will take priority over the mic and line inputs.

Phantom Power.

Phantom power should only be used with suitable microphones (i.e. condenser microphones). It is applied to the mic socket by the push button switch next to the input selection switch.

WARNING:

Always turn the master output level to minimum before switching phantom power on or off, and before connecting or disconnecting a microphone. Failure to set the level to minimum may result in a loud click or thump in your monitor loudspeakers or PA system.

Microphone Input.

When using the Pre-Amplifier with a microphone input, care should be taken not to apply too much gain at the input. Start with the input gain control set to minimum, and the output master at the mid-point (12 o'clock position). The input gain can then be gradually increased until the LED bargraph illuminates to about +4dB on normal signal level. The master output level should then be adjusted to produce the required output.

Line Input.

A line level signal should already be at about the correct operating level, but this may be checked by monitoring the level on the output meter, with the compressor bypassed and the output gain at 0dB. The input gain should be adjusted until the meter reads about +4dBu at normal audio level.

Instrument Input.

The front panel auxiliary instrument input socket is suitable for low level sources such as microphones, pick ups or passive guitars and higher level sources such as active guitars and keyboards. To cater for this wide variety of sources, the Pre-Amplifier has a large amount of gain available, and care should be taken to avoid applying excessive input gain with a high level source.

LF Cut Filter.

The Pre-Amplifier is equipped with high pass (low frequency cut) filter, which may be used to remove unwanted low frequencies from the input signal. It is effective in

reducing hum, rumble caused by traffic or wind noise, and excessive LF signal content from close mic applications.

Compressor Section.

Compressor Operation.

A compressor functions by reducing the gain of the signal when it exceeds a certain level, or threshold. The amount of gain reduction may be fairly gentle through to limiting, where the signal is clamped at the threshold level. The amount of gain reduction is determined by the ratio control, which is calibrated as a ratio of the output to input signals.

The gain of the signal is reduced by a voltage-controlled circuit. Variable time constants are applied to the control voltage to adjust the rate at which the gain is reduced, called the attack time, and the rate at which unity gain is restored after the signal returns to below the threshold, referred to as the release time.

The effect of compression is to limit the dynamic range of a signal. It may be used to keep a variable output from a bass guitar, for example, at an even level, or to add punch to vocals, drums, guitar or a complete mix. Whilst the subjective sound quality can be improved by compression, the overall signal level may be reduced. A gain make-up control at the output of the compressor stage allows the signal level to be brought back to the same loudness as the uncompressed signal.

Threshold.

The 5050 compressor section has a variable threshold, set by a rotary control calibrated from +20dBu to -20dBu, resulting in increased compression as the control is rotated clockwise.

Attack and Release.

The attack time is switchable to 0.5msec or 20msec. At 0.5msec attack, the compressor is fast enough to reduce the gain of a 1KHz signal in less than half a cycle, effectively preventing an overload of any following equipment which has limited headroom, such as a digital processor, tape machine or transmitter.

The release time is switchable to 40msec or approximately 2 seconds. Adjustment of the attack and release times allows unobtrusive compression to be applied to virtually any audio signal, but should very short transients occur the time constants become signal dependant, generally reduced, to prevent a slow release leaving a "hole" in the signal after the transient. Also, a fast release setting will be extended by a slow attack setting. Due to this automatic modification of the time constants, the controls are simply calibrated "fast" and "slow".

A “Hold” circuit delays the onset of release for approximately 10msec after the input signal reduces below the threshold. This feature helps to reduce the distortion commonly caused when using a compressor with a short release time to process a low frequency signal, for example a bass guitar, where the compressor attempts to modify the gain during each half cycle of the input waveform. If distortion is experienced under these circumstances, the slower release time should be selected.

Ratio.

The ratio may be varied from 1:1.5 (very gentle compression) to 1:30 (near limiting). The compressor normally operates with a “soft-knee”, i.e. the compression is gradually introduced as the signal passes the threshold, in which case the ratio refers to the compression eventually obtained.

Gain Make-Up.

Up to 20dB of gain make-up may be applied, to retain the subjective loudness of the signal.

Bypass.

The Compressor Bypass switch allows the processing to be bypassed for comparison of the compressed signal (with any gain make up that has been applied), with the original signal. A green LED indicates when the compressor is in circuit.

Output Fader.

The master level control is an output fader, which enables the Pre-Amplifier output to be matched to the following equipment. The control is calibrated for 0dB at its centre, with a further 15dB of gain available by turning the knob fully clockwise. The additional gain may be useful if the output of the Pre-Amplifier is connected directly to a digital recorder which requires a high level of modulation. Note that applying additional gain at the output will not increase the dynamic range of the signal, but will increase the noise level as well as the audio signal being recorded, and should therefore only be used if an output level in excess of the nominal +4dBu is required.

Bargraph Meters.

The Pre-Amplifier is equipped with twin 8 segment LED bargraph meters.

The output (right-hand) meter monitors the audio output from the unit. It has a peak reading characteristic, with fast attack and slower decay.

The left-hand meter indicates the gain reduction occurring at the compression stage. It will give a continuous reading, even if the compressor is bypassed. It should be noted that the gain reduction indication is most useful as a measure of the compression of the signal, and therefore does not include the effect of any gain make-up that may be applied.

SPECIFICATIONS

Microphone Input:

Electronically balanced.
Input impedance greater than 2Kohm.
Gain range +16dB to +60dB.
Noise -127dBu (EIN with 150 ohm source, 22Hz - 22KHz and maximum gain).
3 pin female XLR connector.

Phantom Power:

+48V at 10mA maximum.

High Pass Filter:

-3dB at 90Hz, 12dB per octave.

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 pole 0.25" jack socket.

Auxiliary Input:

Gain control range 40dB.
Maximum input level +12dBu.
2 pole 0.25" jack socket.

Compressor:

Threshold -20dBu to +20dBu,
Attack 0.5msec to 20msec,
Release 40msec to 2 seconds,
Ratio 1:1.5 to 1:30,
Gain Make-Up 0 to +20dB.

Output Fader:

Rotary fader, 0dB at centre, +15dB maximum gain.

Output:

Unbalanced.
Output impedance 47 ohms.
Maximum level +20dBu.
2 pole 0.25" jack socket.

Frequency Response:

10Hz to 40KHz, +0, -1dB.

Noise:

-80dBu, 22Hz to 22KHz, line input selected at 0dBu input and output gain.

Dynamic Range:

100dB (Line input @ 0dB gain).

Power Requirements:

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

Dimensions:

19" rack mounting, 2U high.
483mm wide x 88mm high x 200mm deep.

Weight:

2.5Kg.

The above specifications are subject to change without notice.

SERVICE

Should the Pre-Amplifier require service, it must 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 Pre-Amplifier 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 include proof of purchase date if claiming repair under warranty.

For your own records, please complete the following details:

Serial Number.....

Date purchased.....

Dealer.....