# User's Manual

# ALTO GATE

## EXPANDER/GATE

ALTO®

www.altoproaudio.com

Version 1.0 July 2003

— English —

## SAFETY RELATED SYMBOLS


This symbol, wherever used, alerts you to the presence of un-insulated and dangerous voltages within the product enclosure. These are voltages that may be sufficient to constitute the risk of electric shock or death.

This symbol, wherever used, alerts you to important operating and maintenance instructions. Please read.

⏚ Protective Ground Terminal

~ AC mains (Alternating Current)

Hazardous Live Terminal

**ON:** Denotes the product is turned on.

**OFF:** Denotes the product is turned off.

**WARNING**

Describes precautions that should be observed to prevent the possibility of death or injury to the user.

**CAUTION**

Describes precautions that should be observed to prevent damage to the product.

## WARNING

- **Power Supply**

  Ensure that the mains source voltage (AC outlet) matches the voltage rating of the product. Failure to do so could result in damage to the product and possibly the user.

  Unplug the product before electrical storms occur and when unused for long periods of time to reduce the risk of electric shock or fire.

- **External Connection**

  Always use proper ready-made insulated mains cabling (power cord). Failure to do so could result in shock/death or fire. If in doubt, seek advice from a registered electrician.

- **Do Not Remove Any Covers**

  Within the product are areas where high voltages may present. To reduce the risk of electric shock do not remove any covers unless the AC mains power cord is removed.

  **Covers should be removed by qualified service personnel only.**

  No user serviceable parts inside.

- **Fuse**

  To prevent fire and damage to the product, use only the recommended fuse type as indicated in this manual. Do not short-circuit the fuse holder. Before replacing the fuse, make sure that the product is OFF and disconnected from the AC outlet.

- **Protective Ground**

  Before turning the product ON, make sure that it is connected to Ground. This is to prevent the risk of electric shock.

  Never cut internal or external Ground wires. Likewise, never remove Ground wiring from the Protective Ground Terminal.

- **Operating Conditions**

  Always install in accordance with the manufacturer's instructions.

  To avoid the risk of electric shock and damage, do not subject this product to any liquid/rain or moisture. Do not use this product when in close proximity to water.

  Do not install this product near any direct heat source.

  Do not block areas of ventilation. Failure to do so could result in fire.

  Keep product away from naked flames.

## IMPORTANT SAFETY INSTRUCTIONS

Read these instructions

Follow all instructions

Keep these instructions. Do not discard.

Heed all warnings.

Only use attachments/accessories specified by the manufacturer.

- **Power Cord and Plug**

  Do not tamper with the power cord or plug. These are designed for your safety.

  Do not remove Ground connections!

  If the plug does not fit your AC outlet seek advice from a qualified electrician.

  Protect the power cord and plug from any physical stress to avoid risk of electric shock.

  Do not place heavy objects on the power cord. This could cause electric shock or fire.

- **Cleaning**

  When required, either blow off dust from the product or use a dry cloth.

  Do not use any solvents such as Benzol or Alcohol. For safety, keep product clean and free from dust.

- **Servicing**

  Refer all servicing to qualified service personnel only.

  Do not perform any servicing other than those instructions contained within the User's Manual.

## PREFACE

Dear Customer:

Thanks for choosing ▲LTO GATE and thanks for choosing one of the results of ▲LTO AUDIO TEAM job and researches.

For our ▲LTO AUDIO TEAM, music and sound are more than a job... are first of all passion and let us say... our obsession!

We have been designing professional audio products for a long time in cooperation with some of the major brands in the world in the audio field.

The ▲LTO line presents unparalleled analogue and digital products made by Musicians for Musicians in our R&D Centers in Italy, Netherlands, United Kingdom and Taiwan. The core of our digital audio products is a sophisticated DSP (Digital Sound Processor) and a large range of state of the art algorithms which have been developed by our Software Team for the last 7 years.

Because we are convinced you are the most important member of ▲LTO AUDIO TEAM and the one confirming the quality of our job, we like to share with you our work and our dreams, paying attention to your suggestions and your comments.

Following this idea we create our products and we will create the new ones! From our side, we guarantee you and we will guarantee you also in future the best quality, the best fruits of our continuous researches and the best prices.
Our ▲LTO GATE is the result of many hours of listening and tests involving common people, area experts, musicians and technicians.

The results of this effort is that you can acquire an extremely efficient and universal dynamics processor. It Contains several new circuits design which make the unit an ultimate dynamic processor: interactive Expander/Gate and super low distortion VCA (Voltage Controlled Amplifier).

Nothing else to add, but that we would like to thank all the people that made the ▲LTO GATE a reality available to our customers, and thank our designers and all the ▲LTO staff, people who make possible the realization of products containing our idea of music and sound and are ready to support you, our customers, in the best way, conscious that you are our best richness.

Thank you very much.
▲LTO AUDIO TEAM

## TABLE OF CONTENTS


1. INTRODUCTION....4

2. THE CONCEPT BEHIND....4

2.1 Some Technical Stuff

2.2 Voltage Controlled Amplifier (VCA)

2.3 Inputs

3. CONTROLS....6

3.1 The Front Panel

3.2 The Rear Panel

4. INSTALLATION AND CONNECTION....8

5.1 Mains Connection

5.2 Audio Connection

5.3 Rack Mounting

5. TECHNICAL SPECIFICATIONS ....11

6. BLOCK DIAGRAM ....12

7. WARRANTY ....13

## 1. INTRODUCTION

You are now the owner of an ▲LTO GATE. Your ▲LTO GATE is based on many years of experience and is designed to eliminate noise in systems, hiss and hum in amplifiers, surrounding noise and so on. For more information, please read this manual carefully.

Feature List:

- Mountable in one standard 19" rack unit
- Illuminated power switch
- Manually adjustable HOLD and RELEASE time
- Indicating gain attenuation with 8-segment LED
- Range control for gate mode while ratio for expander mode
- Balanced XLR and 1/4" TRS connectors for inputs and outputs
- Side-chain Filter
  The adjustable parametric side-chain filter allows the user to select and eliminate certain frequencies that may result in unwanted triggering of the gate and expander.
- The EXPANDER/GATE Section
  You can select freely the EXPANDER/GATE mode in your unit. The two modes can reduce or cut-off the level of audio signal below a certain set threshold to avoid unexpected noise.
- Super quality parts and rigid configuration for long life and full credibility

## 2. THE CONCEPT BEHIND

### 2.1 Some Technical Stuff

Good old analog technology: It will allow us to manufacture audio equipment with a very high dynamic range: up to 125 dB. But the dynamic range of digital equipment is more or less 25 dB less. A further reduction in dynamic range occurs with the use of tape recorders and/or vinyl records.

#### 2.1.1 It is not just Music

Yes, a piece of electronic will produce some noise. When the current flows through a conductor this will generate a certain movement of the electrons and therefore: noise. And throughout the whole spectrum of audio. Imagine what happens when this inherent noise will be amplified. Yes, today one can use "low-noise" components but still such components will present a certain level of residual noise.

For example with tape recorders it will not be possible to get an S/N (signal to noise) ratio better than 70dB. This level would not be accepted today by the increased sensitivity of the Listeners. It is possible to improve the performance of a tape recorder: Absolutely no!

#### 2.1.2 Introducing Audio Dynamics

The human ear can detect the noise generating by falling leaves as well as the roar generated by the taking off space shuttle. Unfortunately no analog, nor digital device can reproduce such wide spectrum. Please look at Chart. 1 and you will see the difference if dynamic capacity of various devices when compare to the human ear. More problems occur when handling high level signals and low level signals. When you reach the high level limit you may incur in distortion because of the dynamic range of the instrument therefore a certain "reserve" must be maintained to avoid distortion.

This reserve is known as "headroom" and it is usually set at 10～20 dB. Would not be easier just to reduce the operating level? Yes, it would. But you would put low level music signals at the same level of the basic noise floor so the overall quality of the signal would be highly deteriorated. Please look at Chart. 2 and note the Usable dynamic range (including headroom) versus high level distortion generated by peaks, and Noise floor level.

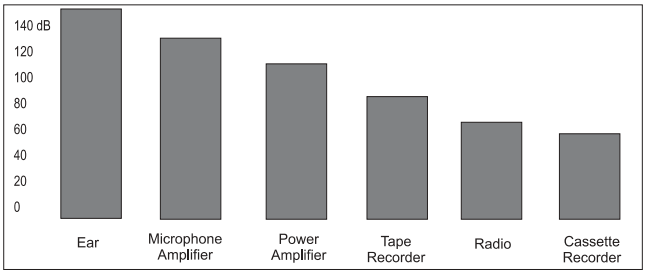



Chart. 1 The dynamic range capabilities of various devices

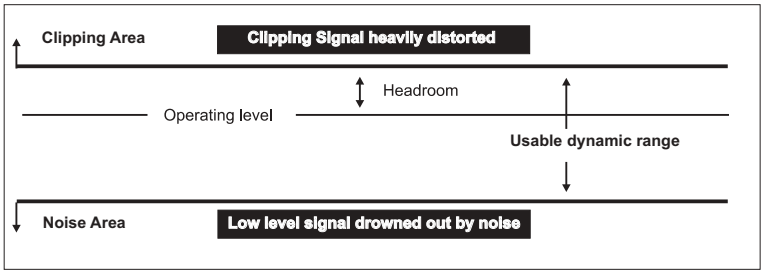



Chart. 2 The interactive relationship between the operating level and the headroom

So the operating level must be as high as possible but not high enough to generate distortion.
There is a very easy way to obtain this. With the volume knob in hand you increase the volume during low passages and decrease the volume during loud passages. Unfortunately even the Great Houdini would not be fast enough to monitor carefully the speed of the musical signal and it would be impossible to detect signal peaks and consequently levelling them out. Manual control is therefore out of question. The answer is AGC (automatic gain control); a device that will monitor the signal in real time and that will adjust the gain for the best S/N ratio without producing distortion.

### 2.1.3 More about noise: Expanders and Noise-Gates

A lot of instruments such as microphones, amplifiers, guitar pickups, etc generate some noise, either at low frequencies (hum) or at high frequencies (hiss). Such noise will inevitably interfere with the quality of your audio signal. Now, if you scream into a microphone you will not hear the noise generated by such microphone because such noise will be "masked" by the higher level of the signal, your voice in this case.
But if you sing into your microphone more gently in a soft passage, the level of the signal generated by your voice will get much closer to the floor noise level and such floor noise will become disturbing. In order to kill this problem Expanders and noise-gates are used. An expander is the opposite of a compressor: attenuating the signal when the amplitude drops, they can limit the floor noise.

Now, we do not need dramatic expansion of a signal across the range; This would generate a resulting dynamic range of over 150dB. For this reason the amplitude control will be applied only to those audio signals which are below a set threshold. Those audio signals above the set threshold will not be affected. Noise-gate can be regarded as a simple Expander. But the Expander will attenuate the audio signal contin -uously below the set threshold while the noise-gate will simply dramatically cut-off the audio signal completely.

## 2.2 Voltage Controlled Amplifier (VCA)

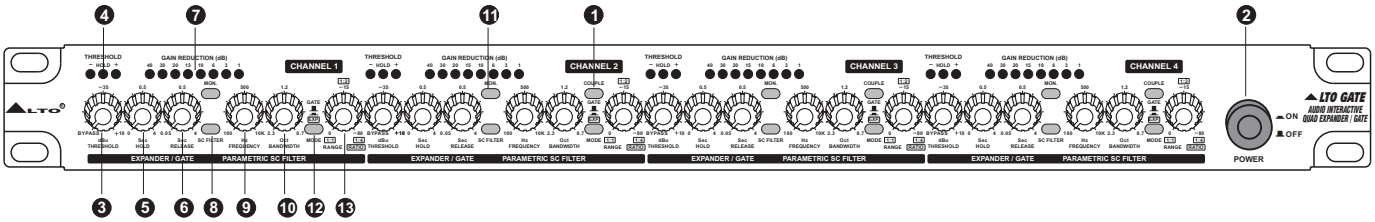
The VCA is the soul of the ▲LTO GATE and it is one of the best components available today in his category thanks to its excellent performances in terms of distortion, linearity, noise and temperature stability.

## 2.3 Inputs

### 2.3.1 Take it easy: Balanced Inputs

To make your life easy and clean we have provided ▲LTO GATE with electronically balanced inputs. Even if you operate at high signal levels, hum and noise will be reduced automatically. There is also a servo-function that will automatically adjust the internal level when unbalanced connectors are detected. The correction is of 6dB and it will avoid differences in level in between input and output signal.

# 3. CONTROLS




Pic. 1 The Front Panel of The ▲LTO GATE

Your ▲LTO GATE presents with four channels. Each channel is equipped with the same elements: 3 push-button switches, 6 rotary controls and 11 LEDs. You can easily operate the stereo mode via pressing the Couple switch. The details please refer to following content.

## 3.1 The Front Panel

**1. Couple Switch**

Pressing this push-button for stereo mode operation.
When engaged, the front channel will take control of the next channel and override all the controls and switches of the next channel with exception of the SC Monitor.

**2. POWER Switch**

Turn the apparatus ON or OFF.

**3. THRESHOLD Control**

This control adjusts the threshold level for the Expander / Gate Section in the range of Bypass to +10dBu. Signals below this level cause expansion.

**4. THRESHOLD LED**

The "+" LED lights up when the expander / gate is activated.
The HOLD LED lights up when the hold circuit starts to work.
The "-" LED lights up when there are no audio signals below the set threshold.

**5. HOLD Control**

It represents the amount of time that passes before the release process starts to work when the signal is below the threshold point. (Used only in GATE mode.)

**6. RELEASE Control**

It determines the amount of time in the release process. The release time on ▲LTO gate can be set from 0.05 to 4 seconds. (Used only in GATE mode.)

**7. GAIN REDUCTION Meter**

It indicates the gain reduction. The range displayed is from 1 to 40 dB.

**8. SC FILTER Switch**

This switch is used to activate the parametric side-chain filter. You can set its function by adjusting the frequency and bandwidth control.

**9. FREQUENCY Control**

This control is used to choose frequency of the side-chain filter from 100Hz to 10kHz.

**10.BANDWIDTH Control**

This control is used to choose bandwidth of the side-chain filter from 2.3 to 0.7 octaves.

**11.MONITOR Control**

You can connect the side-chain control signal to the audio output using this switch. Engage it to eliminate the functions of expander and gate. There are only frequency and bandwidth controls that can control the unit.

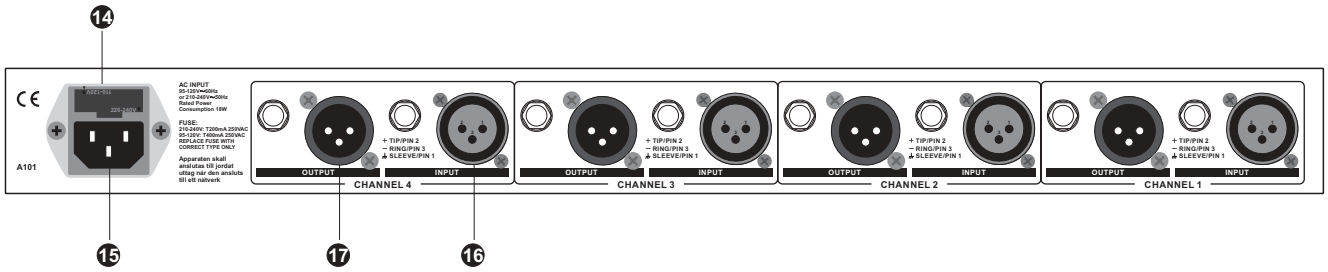
**12.MODE Switch**

It can set the operational mode of this unit. You are able to operate it as an expender when it is pressed. On the contrary, you can operate it as a gate when it is not pressed.

**13.RANGE/RATIO Control**

The control is relying on the operational mode of this unit. The RANGE control can only be used in GATE mode. It adjusts the amount of maximum gain reduction and covers a range from 0 to -80. The RATIO control can only be used in EXPANDER mode. It determines the ratio between the input and output level of audio signals below the set threshold level. This control manually adjustable from 1:1 to 1:4.

## 3.2 The Rear Panel

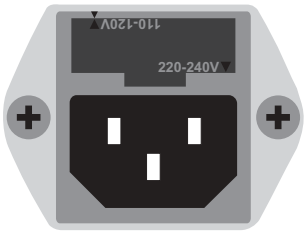



Pic. 2 The Rear Panel of The ▲LTO GATE

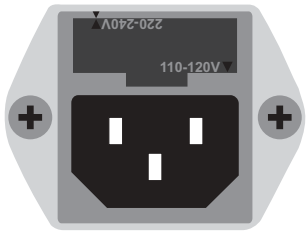
**14.FUSE Holder / Voltage Selector**

Your unit may have the voltage selector (～115V/60Hz or ～230V/50Hz) built into the Fuse Holder. With a small screwdriver pull/pop out the Fuse Holder and rotate it so that the arrow showing the proper voltage in your area points toward the other arrow in the upper left comer of plug assembly and reinsert.

**Caution:** The fuse protecting the AC supplies circuits of this unit. The fuse can only be changed by a qualified technician, in the event of a fault or changing the supply voltage. If the fuse continues to blow after replacing, discontinue use of this unit before repaired.




THIS IS SET FOR
110V AC TO 120V
AC OPERATION




THIS IS SET FOR
220V AC TO 240V
AC OPERATION

The fuse-holder above the AC connector on the rear of the chassis has 3 triangular markers (please refer to the above pictures), with two of these triangles opposing each other, your unit is set to the operating voltage printed next to these markers.

To change, pull fuse-holder out and rotate 180°, then push in again.

**15. AC Inlet**

Please don't plug power cord into this unit and AC power if voltage has not been correctly set.

**16. Audio In**

The inputs are balanced XLR and 1/4" TRS connectors, they can be used to input signals.

**17. Audio Out**

The outputs are balanced XLR and 1/4" TRS connectors, they can be used to output signals.

## 4. INSTALLATION AND CONNECTION

### 4.1 Mains Connection

▲LTO GATE is provided with dual voltage plug. You must check the power supply voltage available in your country before connecting the power cord in the wall outlet. Please see Page 8 for further information.

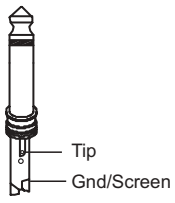
### 4.2 Audio Connection

The ▲LTO GATE is equipped with balanced XLR connectors as well as 1/4" phone jack and can be connected with other units in different ways to support a vast range of applications without experiencing a signal loss.

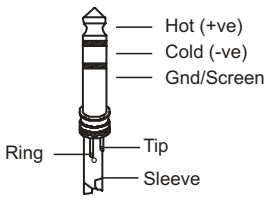
**a. Wiring Configuration**

Both types of connectors available on ▲LTO GATE can be wired in balanced and unbalanced modes.
Please see following drawing for details:

- For 1/4" TRS jack

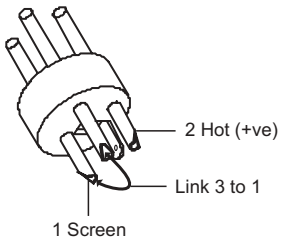



Unbalanced

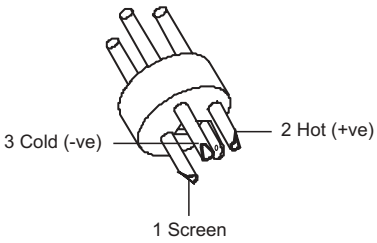



Balanced

• For XLR connector




XLR Unbalanced input

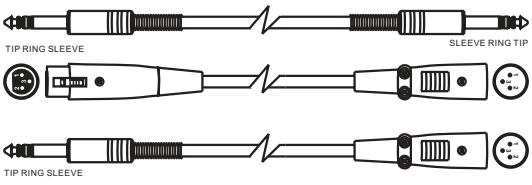


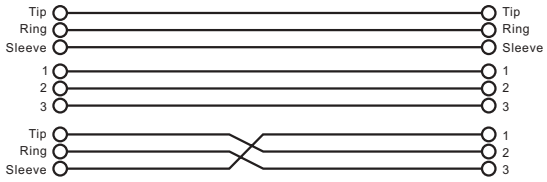

XLR Balanced input

**b. In Line Connection**

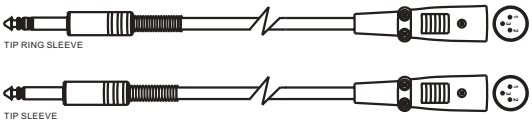
Please see following drawing for details:

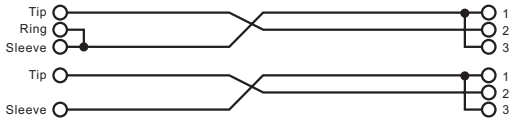
• Balanced

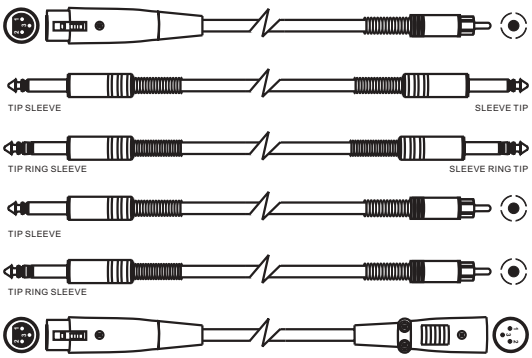


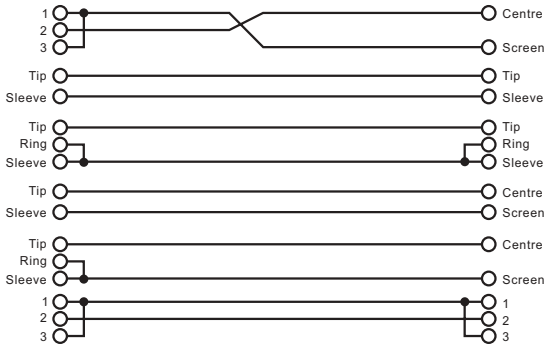




• Unbalanced



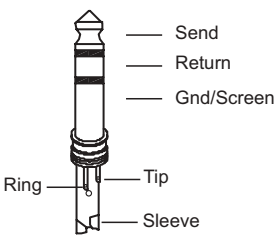



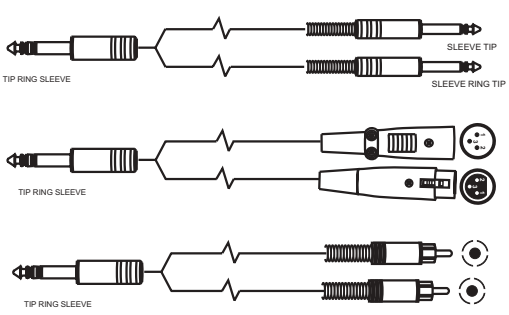

**c. Insert Points Connection**

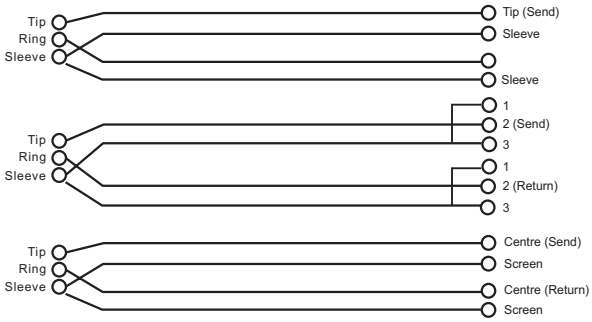
In case you are using the main inserts of your mixing console and you have a single jack for SEND and RETURN, you can use an insert Y cable. Please see following drawing:

• 1/4" TRS insert



• Insert Leads




## 4.3 Rack Mounting

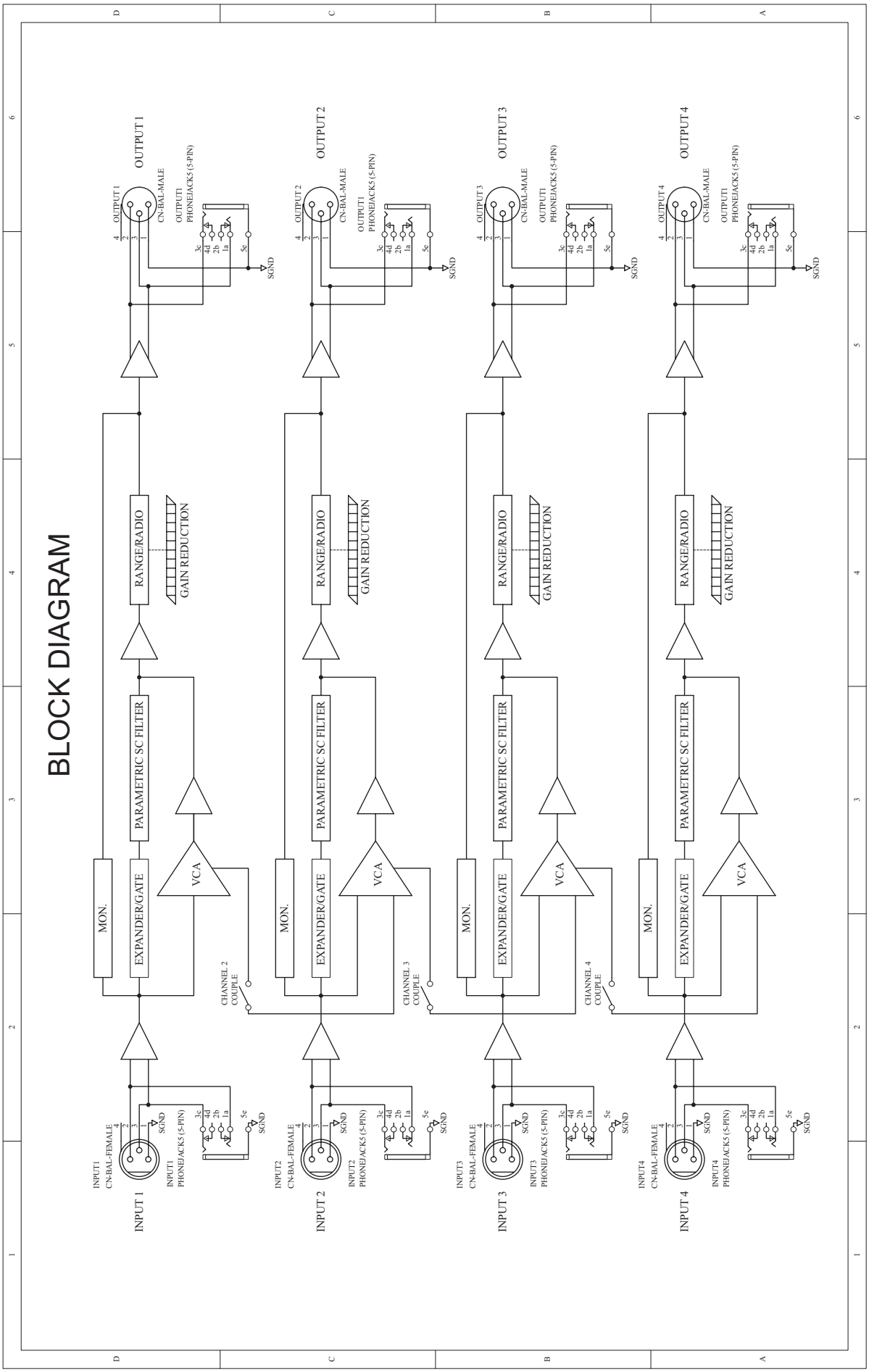
The most secure mounting is on a universal rack shelf available from various rack manufactures or your music dealer. The ▲LTO GATE fits into one standard 19" rack unit of space.

Please allow at least an additional 4" depth for the connectors on the rear panel. Be sure that there is enough air space around the unit for sufficient ventilation and please do not place the ▲LTO GATE on high temperature devices such as power amplifiers etc. to avoid overheating.

## 5. TECHNICAL SPECIFICATIONS

| | | |
|---|---|---|
| AUDIO INPUT | Connectors | XLR and 1/4" JACK |
| | Type | RF filtered, servo-balanced input |
| | Max. Input Level | Balanced and Unbalanced: +21 dBu |
| | Impedance | Balanced: 50kOhm Unbalanced: 25kOhm |
| | CMRR | typ.40dB, >55dB@1kHz |
| AUDIO OUTPUT | Connectors | XLR and 1/4" JACK |
| | Type | Electronically servo-balanced output stage |
| | Max. Output Level | Balanced and Unbalanced: +21dBu |
| | Impedance | Balanced: 60 Ohm Unbalanced: 30 Ohm |
| FUNCTION SWITCHES | Monitor | Monitors the side-chain key signal |
| | Couple | Activates FlexLink function |
| | Mode | Expander/Gate switch |
| | Filter | Activates the side-chain Filter |
| INDICATORS | Gain Reduction | 8-segment LED display: 1/3/6/10/15/20/30/40dB |
| | "-" indicator | Signal is above threshold |
| | "Hold" indicator | Signal reaches threshold |
| | "+" indicator | Signal is below threshold |
| GATE SECTION | Type | UTR (Ultra Transient Response) gate |
| | Range | Variable: from 0 to -80dB |
| | Threshold | Variable: from BYPASS to +10dBu |
| | Attack | Program dependent |
| | Hold | Variable: from 0 to 4sec |
| | Release | Variable: from 0.05 to 4sec |
| EXPANDER SECTION | Type | IRC (Interactive Ratio Control) expander |
| | Attack | Program dependent |
| | Ratio | Variable: from 1:1 to 1:4 |
| PARAMETRIC SC FILTER | Frequency | Variable: from 100Hz to 10kHz |
| | Bandwidth | Variable: from 2.3 to 0.7 oct. |
| SYSTEM SPECIFICATIONS | Frequency Response | From 20Hz to 30kHz |
| | Noise | >90dBu, unweighted, 22Hz to 22kHz |
| | THD | 0.01% typ. @+4dBu, 1kHz, GAIN 1 |
| | IMD | 0.01% typ. SMPTE |
| | Crosstalk | <-100dB, 22Hz to 22kHz |
| POWER SUPPLY | AC 95-120 Vac～60Hz | Fuse: T400mAL (slow below) |
| | AC 210-240 Vac～50Hz | Fuse: T200mAL (slow below) |
| POWER CONSUMPTION | 18 Watts | |
| DIMENSIONS | 483(W)×194.5(D)×44(H)mm (19×7.7×1.7) | |
| WEIGHT | 3.3kg(7.27lb) | |

## 6. BLOCK DIAGRAM



## 7. WARRANTY

### 1. WARRANTY REGISTRATION CARD

To obtain Warranty Service, the buyer should first fill out and return the enclosed Warranty Registration Card within 10 days of the Purchase Date.

All the information presented in this Warranty Registration Card gives the manufacturer a better understanding of the sales status, so as to purport a more effective and efficient after-sales warranty service.

Please fill out all the information carefully and genuinely, miswriting or absence of this card will void your warranty service.

### 2. RETURN NOTICE

2.1 In case of return for any warranty service, please make sure that the product is well packed in its original shipping carton, and it can protect your unit from any other extra damage.

2.2 Please provide a copy of your sales receipt or other proof of purchase with the returned machine, and give detail information about your return address and contact telephone number.

2.3 A brief description of the defect will be appreciated.

2.4 Please prepay all the costs involved in the return shipping, handling and insurance.

### 3. TERMS AND CONDITIONS

3.1 ▲LTO warrants that this product will be free from any defects in materials and/or workmanship for a period of 1 year from the purchase date if you have completed the Warranty Registration Card in time.

3.2 The warranty service is only available to the original consumer, who purchased this product directly from the retail dealer, and it can not be transferred.

3.3 During the warranty service, ▲LTO may repair or replace this product at its own option at no charge to you for parts or for labor in accordance with the right side of this limited warranty.

3.4 This warranty does not apply to the damages to this product that occurred as the following conditions:

- Instead of operating in accordance with the user's manual thoroughly, any abuse or misuse of this product.
- Normal tear and wear.
- The product has been altered or modified in any way.
- Damage which may have been caused either directly or indirectly by another product / force / etc
- Abnormal service or repairing by anyone other than the qualified personnel or technician.

And in such cases, all the expenses will be charged to the buyer.

3.5 In no event shall ▲LTO be liable for any incidental or consequential damages. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above exclusion or limitation may not apply to you.

3.6 This warranty gives you the specific rights, and these rights are compatible with the state laws, you may also have other statutory rights that may vary from state to state.

**SEIKAKU TECHNICAL GROUP LIMITED**
**No. 1, Lane 17, Sec. 2, Han Shi W. Road, Taichung, 401 Taiwan**
**http://www.altomobile.com Tel: 886-4-22313737**
**email: info@altomobile.com Fax: 886-4-22346757**



NF01357-1.0