

User's Manual

X23

2-WAY STEREO/3-WAY MONO
ACTIVE CROSSOVER



 **LTO**[®]
www.altoproaudio.com
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— 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 Active Crossover and thanks for choosing the one of 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 et 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 Centres 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'd like to share with you our work and our dreams, pay 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 Active Crossover is the result of many hours of listening and tests involving common people, area experts, musicians and technicians.

The results of this effort is an efficient and effective electronic crossover solution, which will give you precise control and superior sound from your loudspeaker system.

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

Thank you very much.

▲LTO AUDIO TEAM

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1. INTRODUCTION

First we give our sincere appreciation for your confidence in ▲LTO products by purchasing our X23 Active Crossover. It is the most effective support to us. The X23 Active Crossover is an ideal crossover and used universally in most small and large PA systems, recording studio monitors, DJ setups, commercial installations and live concerts. It is not only adaptable in mounting to different sound systems, but also it has many developed features. For example, Clip LED Indicators, Mute switches for all frequencies output, CD Boost and Phase Inversion.

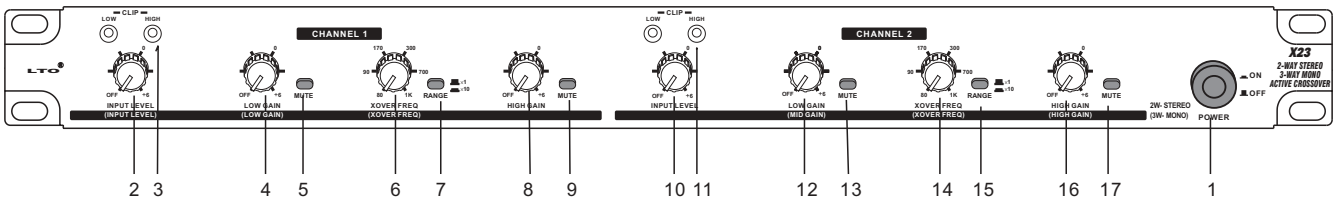
The X23 Active Crossover is a single rack unit, dual channels electronic crossover, which is able to operate as the 2-way stereo and 3-way mono speaker systems.

2. FEATURE LIST

- Single rack unit (1U)
- Clip LED indicators
- Mute switches used to mute the output signal of each frequencies range
- XLR balanced and 1/4" TRS connectors for inputs and outputs
- Phase inversion compensates for corresponding frequencies cancellation in some field
- CD Boost compensates power loss during the long distance transmission
- Superior-quality parts and rigid configuration for long life and full credibility
- Excellent audio performance and low noise interference

3. CONTROL ELEMENTS

3.1 The Front Panel



X23 • 2-way stereo / 3-way mono active crossover		
	2-WAY STEREO MODE	3-WAY MONO MODE
1	Power Switch	
2	Ch1 Input Level	Input Level
3	Ch1 LOW, Ch1 HIGH Clip LEDs	LOW, MID Clip LED
4	Ch1 LOW Gain	LOW Gain
5	Ch1 LOW Mute	LOW Mute
6	Ch1 LOW-HIGH Crossover Frequency 800Hz-10KHz (Range×10)	LOW-MID Crossover Frequency 80Hz-1KHz (Range×1)
7	Ch1 LOW-HIGH Crossover Range	LOW-MID Crossover Range
8	Ch1 HIGH Gain	(not used)
9	Ch1 HIGH Mute	(not used)
10	Ch2 Input Level	(not used)
11	Ch2 LOW, Ch2 HIGH Clip LEDs	(Ignored), HIGH Clip LED
12	Ch2 LOW Gain	MID Gain
13	Ch2 LOW Mute	MID Mute
14	Ch2 LOW-HIGH Crossover Frequency 800Hz-10KHz (Range×10)	MID-HIGH Crossover Frequency 800Hz-10KHz (Range×10)

15	Ch2 LOW-HIGH Crossover Range	MID-HIGH Crossover Range
16	Ch2 HIGH Gain	HIGH Gain
17	Ch2 HIGH Mute	HIGH Mute

• **Power switch**

Turn the power on or off.

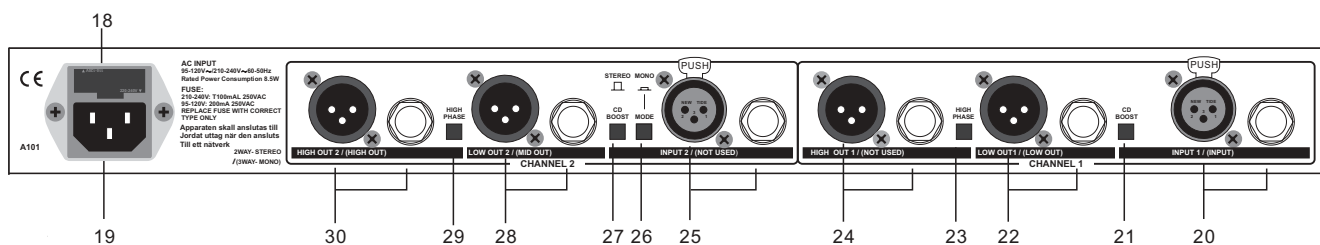
• **Clip LED**

It means that some band has resulted in clipping distortion when the LED is glittering. It is regarded as normal if it is glittering only one or two times. But if it lasts for a long time, you should reduce the input signal to avoid audio distortion.

• **Mute switch**

These buttons are used to mute each kind of frequencies outputs.

3.2 The Rear Panel

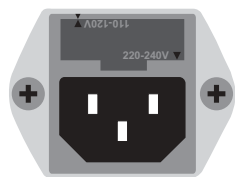


		X23 • 2-way stereo / 3-way mono active crossover	
		2-WAY STEREO MODE	3-WAY MONO MODE
18		Fuse Holder	
19		AC Inlet	
20	Ch1 Line Input (Linked XLR-F&jack)	Line Input (Linked XLR-F&jack)	
21	Ch1 Constant Directivity Boost	Constant Directivity Boost	
22	Ch1 LOW Output (Linked XLR-M&jack)	Low Output (Linked XLR-M&jack)	
23	Ch1 HIGH Phase Inversion	MID Phase Inversion	
24	Ch1 HIGH Output (Linked XLR-M&jack)	(not used)	
25	Ch2 Line Input (Linked XLR-F&jack)	(not used)	
26		Stereo / Mono Mode	
27	Ch2 Constant Directivity Boost	(not used)	
28	Ch2 LOW Output (Linked XLR-M&jack)	MID Output (Linked XLR-M&jack)	
29	Ch2 HIGH Phase Inversion	HIGH Phase Inversion	
30	Ch2 HIGH Output (Linked XLR-M&jack)	HIGH Output (Linked XLR-M&jack)	

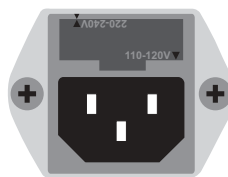
- **Fuse holder & voltage selector**

Your unit may have the AC voltage selector ($\sim 115\text{V}/60\text{Hz}$ or $\sim 230\text{V}/50\text{Hz}$) built into the Fuse Holder. To change, pull fuse-holder out and rotate 180° , then push in again.

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.

- **AC Inlet**

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

- **Inputs & Outputs**

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

- **CD Boost**

Abbreviation for 'Constant Directivity Boost', this button can be used to boost the high frequencies by +3dB at 3.5kHz, then +6dB per octave till 22.5kHz.

Through this function and using with the horns, power loss of the high frequencies can be compensated for during the long distance transmission in the large PA reinforcement systems.

- **Phase inversion**

This button will reverse the phase of the corresponding frequencies output by 180° , so that, the frequencies cancellation in some fields can be compensated for.

- **Mode switch**

It can set the operational mode of this unit. You are able to operate it as a 3-way mono crossover (High/Mid/Low) when it is pressed. On the contrary, you are able to operate it as 2-way stereo crossover (High/Low) when it is released.

4. INSTALLATION & CONNECTION

4.1 Mains Connection

Please ensure that the ▲LTO X23 Active Crossover is set to the correct supply voltage before plugging the power cord into the wall outlet, use the same fuse as marked on the fuse holder at the AC power connection socket.

The mains connection of the ▲LTO X23 Active Crossover is made by using the enclosed mains cord and a standard IEC receptacle. It meets all of the international safety certification requirements.

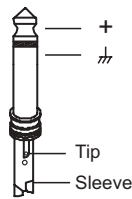
4.2 Audio Connection

The ▲LTO X23 Active Crossover presents with balanced XLR and 1/4" TRS connectors, and it can be interfaced by several ways to support a variety of applications without any signal loss.

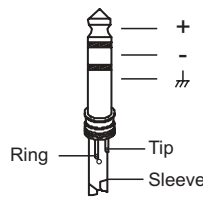
a. Wiring Configuration

Either the 1/4" TRS (Tip-Ring-Sleeve) jack or the XLR servo connector can be wired in balanced and unbalanced modes. Please wire your systems as the following examples:

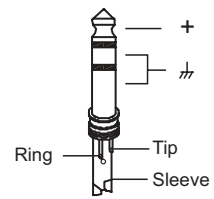
- For 1/4" Phone jack



TS Type Unbalanced

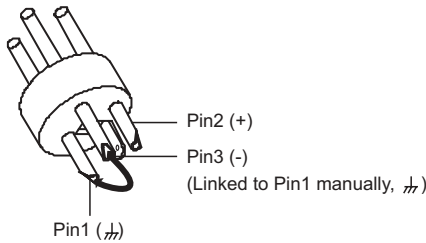


TRS Type Balanced

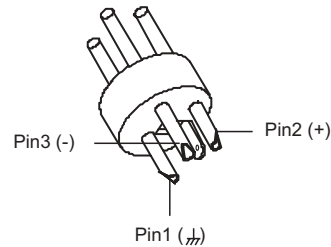


TRS Type Unbalanced

- For XLR connector



XLR Type Unbalanced

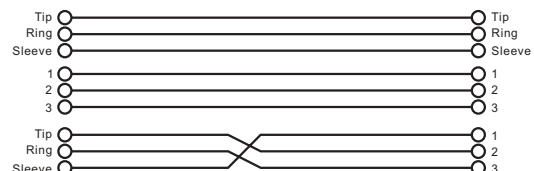
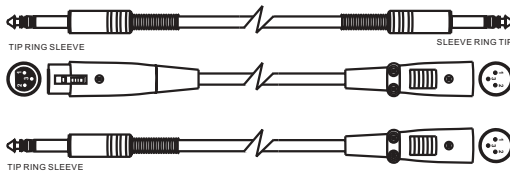


XLR Type Balanced

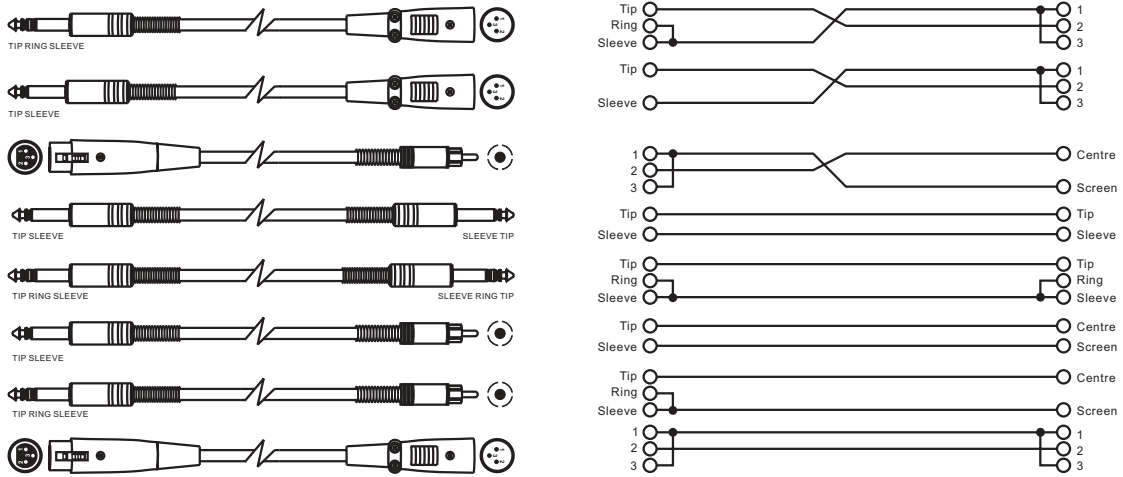
b. In Line Connection

For these applications, the X23 Active Crossover provides XLR connectors to easily interface with most professional audio devices. Follow the configuration examples below for your particular connection.

- Balanced



- Unbalanced



4.3 Rack Mounting

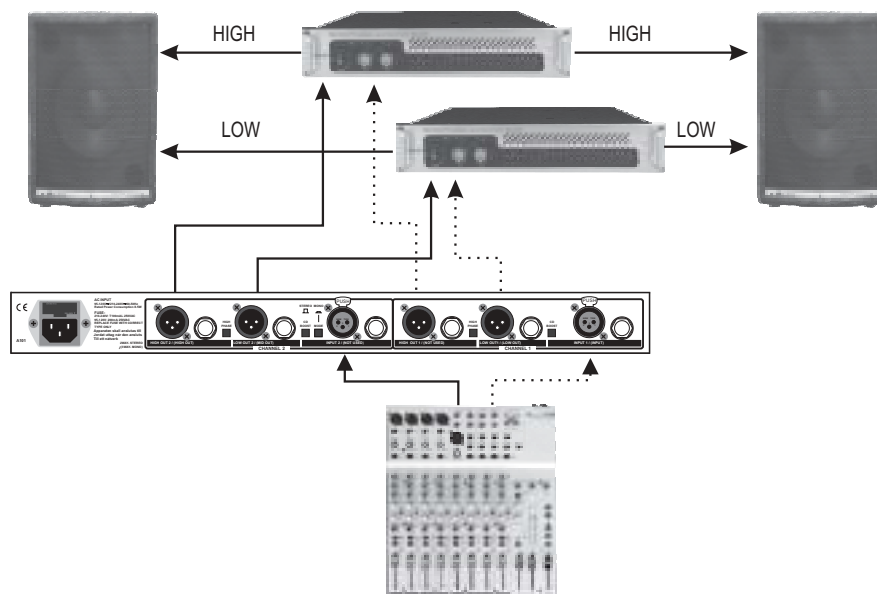
The most secure mounting is on a universal rack shelf available from various rack manufactures or your music dealer. The X23 Active Crossover fits into one standard 19" rack unit of space. Please allow at least an additional 4" depth for the connectors on the rear panel. Be sure that there is enough air space around the unit for sufficient ventilation and please do not place the X23 Active Crossover on high temperature devices such as power amplifiers etc. to avoid overheating.

5. APPLICATION

5.1 X23 2-Way Stereo

To get such a typical application, configure your system and connect the wires in the following proper steps:

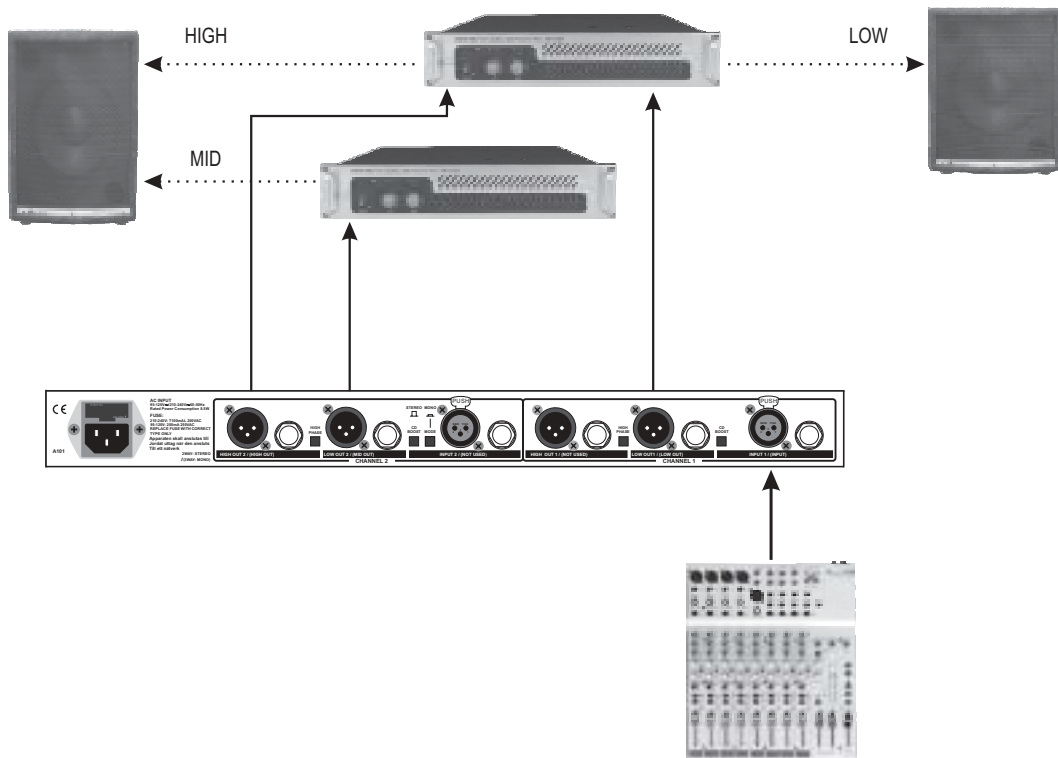
1. Release the mode switch to enter into the 2-way stereo mode.
2. Apply the stereo program sources from the Mixer to the Input Connectors of Channel1 and Channel2.
3. Output the Low frequencies signal to the power amplifier.
4. Output the High frequencies signal to the power amplifier.
5. Set LOW-HIGH Crossover Range of channel1 and channel2 to $\times 10$.
6. Power up the X23 first, then the power amplifier to run the system. While powered off, please ensure the power amplifier is turned off first, then the X23.



5.2 X23 3-Way Mono

To get such a typical application, configure your system and connect the wires in the following proper steps:

1. Press the mode switch to enter into the 3-way mono mode.
2. Apply the mono program sources from the Mixer to the input connector of channel 1.
3. Output the Low frequencies signal to the power amplifier.
4. Output the Mid frequencies signal to the power amplifier.
5. Output the High frequencies signal to the power amplifier.
6. Power up the X23 first, then the power amplifier to run the system. While powered off, please ensure the power amplifier is turned off first, then the X23.



6. TECHNICAL SPECIFICATIONS

Electrical		
	LOW-MID Frequency Range	Range×1 80Hz - 1KHz
	MID-HIGH Frequency Range	Range×10 800Hz - 10KHz
	HUM & Noise	AV=0dB, fc=800Hz
	LOW Section (Output@0dB)	< -106dBu
	HIGH Section(Output @0dB)	< -97dBu
	S/N Ratio	118dB
Controls		
	Input Level	continuously variable
	Output Level	low, high continuously variable
	CD Boost	rear panel switch
	Mute	low, high front panel switches
	Phase	rear panel switch
Power Supply		
	Connector type	3-pole IEC, grounded
	Type	Servo controlled, stabilized
	Mains supply	95-120V~/210-240V~, 60-50Hz
	Power Rating	8.5W
Physical		
	Dimensions	483(W)×194.5(D)×44(H)mm (19"×7.7"×1.7")
	Weight	3.1Kg (6.84lb)

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

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