



## ***OWNER'S MANUAL***

### ***MAC 2.2/2.3/2.4*** **PROFESSIONAL STEREO AMPLIFIERS**




www.altoproaudio.com  
Version 1.1 NOV 2007


***English***

# IMPORTANT SAFETY INSTRUCTION



**TO REDUCE THE RISK OF ELECTRIC SHOCK PLEASE DO NOT REMOVE THE COVER OR THE BACK PANEL OF THIS EQUIPMENT. THERE ARE NO PARTS NEEDED BY USER INSIDE THE EQUIPMENT. FOR SERVICE, PLEASE CONTACT QUALIFIED SERVICE CENTERS.**

 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.

## CAUTION

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


1. Read this Manual carefully before operation.
2. Keep this Manual in a safe place.
3. Be aware of all warnings reported with this symbol. 
4. Keep this Equipment away from water and moisture.
5. Clean it only with dry cloth. Do not use solvent or other chemicals.
6. Do not damp or cover any cooling opening. Install the equipment only in accordance with the Manufacturer's instructions.
7. Power Cords 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.
8. Unplug this equipment when unused for long periods of time or during a storm.
9. Refer all service to qualified service personnel only. Do not perform any servicing other than those instructions contained within the User's Manual.
10. 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.

## WARNING

**To reduce the risk of electric shock and fire, do not expose this equipment to moisture or rain.**



**Dispose of this product should not be placed in municipal waste and should be separate collection.**

11. Move this Equipment only with a cart, stand, tripod, or bracket, specified by the manufacturer, or sold with the Equipment. When a cart is used, use caution when moving the cart / equipment combination to avoid possible injury from tip-over. 

12. Permanent hearing loss may be caused by exposure to \ extremely high noise levels. The US. Government's Occupational Safety and Health Administration (OSHA) has specified the permissible exposure to noise level. These are shown in the following chart:

HOURS X DAY	SPL	EXAMPLE
8	90	Small gig
6	92	train
4	95	Subway train
3	97	High level desktop monitors
2	100	Classic music concert
1,5	102	
1	105	
0,5	110	
0,25 or less	115	Rock concert

According to OSHA, an exposure to high SPL in excess of these limits may result in the loss of heat. To avoid the potential damage of heat, it is recommended that Personnel exposed to equipment capable of generating high SPL use hearing protection while such equipment is under operation.

The apparatus shall be connected to a mains socket outlet with a protective earthing connection.

The mains plug or an appliance coupler is used as the disconnect device, the disconnect device shall remain readily operable.

## IN THIS MANUAL:

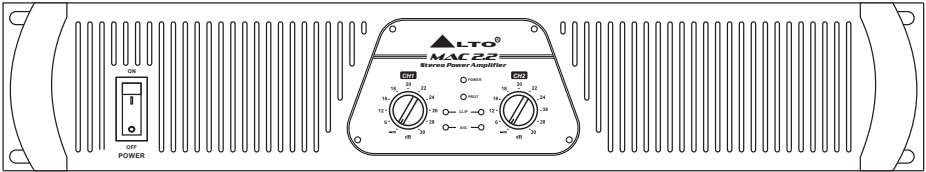
1. INTRODUCTION.....	1
2. FEATURES.....	1
3. CONTROL ELEMENTS.....	5
4. OPERATION.....	8
5. BLOCK DIAGRAM.....	11
6. TECHNICAL SPECIFICATIONS.....	12
7. WARRANTY.....	13

## 1. INTRODUCTION

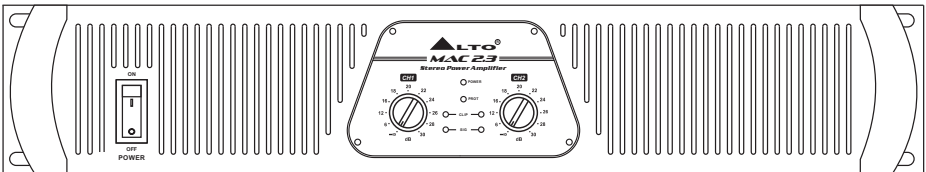
Thank you for expressing your confidence in ▲LTO products by purchasing one of our MAC 2 Series stereo amplifiers. The MAC 2 series include MAC 2.2, MAC 2.3 and MAC 2.4. All models are rugged, 2 rack-unit stereo amplifiers fan-cooled. Despite their compact dimensions they provide a lot of power and a high value performance. They are all designed for heavy-duty application and they all can drive 2 ohm loads for long periods without overheating. Therefore they are suited to drive subwoofers with a minimum load of 4 ohms when working in Bridge Mode.

## 2. FEATURES

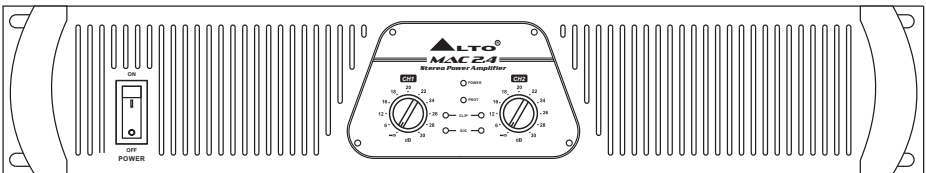
- ▲ Clip-limiter circuit that is user-adjustable
- ▲ Switchable low-frequency filter at 30Hz
- ▲ Operating Mode is: Stereo, Parallel or Bridge
- ▲ Balanced XLR and 1/4" TRS input connectors
- ▲ Output connectors are speak-on jacks and binding post terminals
- ▲ Low-noise, variable speed fan
- ▲ Front panel LED indicating Signal and Clipping and Protection Status
- ▲ Manufactured under QS9000, VDA6.1 certified management system



**MAC 2.2**



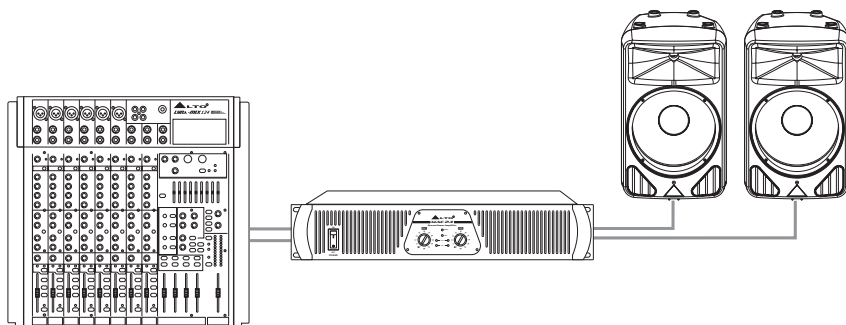
**MAC 2.3**



**MAC 2.4**



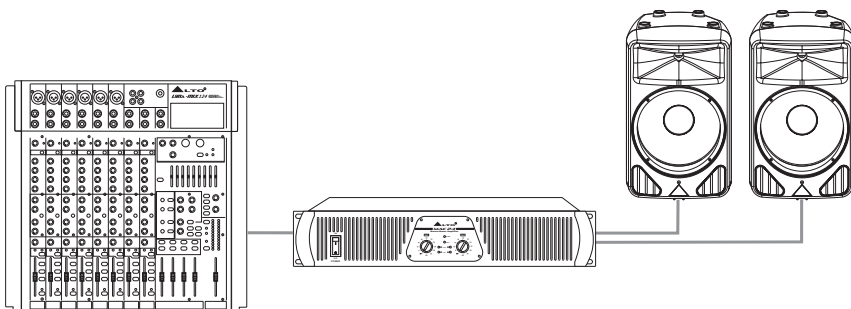
## STEREO MODE



In this mode, 2 independent channels are sent to 2 separate speakers.



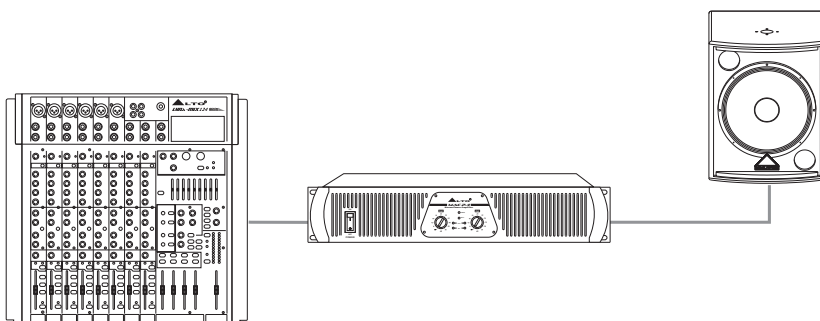
## PARALLEL MODE



One mono signal is input to channel 1 or Channel 2 of the MAC 2 series amplifier and then output to 2 separate speakers. Each speaker volume can be set separately.



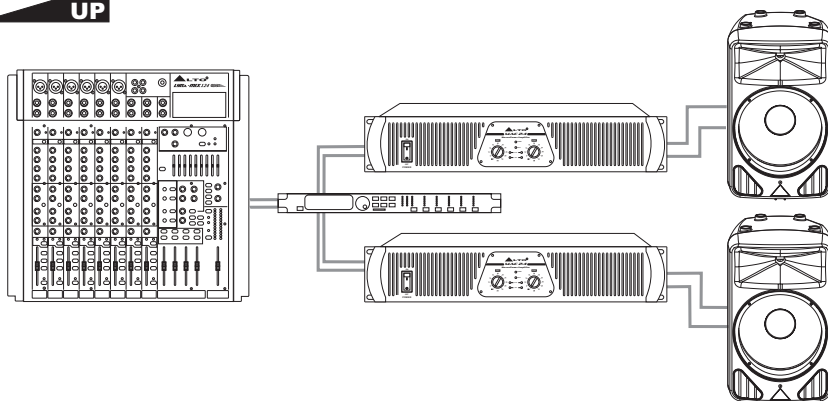
## BRIDGE MODE



The stereo or mono signal input to channel 1 and channel 2 is combined on the BRIDGE MONO connector. Only channel 1 Gain control is active. The power at the output will be combined power of the two channels.



## STEREO BIAMP



The Main Mix signal is routed into an electronic crossover: channel 1 drives the woofer and channel 2 drives the high frequency driver in a 2-way enclosure.



### 3. CONTROL ELEMENTS

#### Front Panel:

##### 1 POWER SWITCH

It powers the MAC 2 series ON and OFF.

##### 2 POWER INDICATOR LED

This Power LED lights up when the unit is powered up.

##### 3 PROTECTION LED

- It will light up when the unit is in Protection Mode due to overheating, short circuit, low impedance load or other causes (For MAC 2.2 & MAC 2.3).
- It will light up when the unit is in Protection Mode due to overheating, exist DC output or other causes (Only for MAC 2.4 ).

##### 4 Clip LED

- These LEDs will light up when distortion reaches a level of 0.5%, Turn the relative GAIN control down so that the CLIP LEDs only flash occasionally (For MAC 2 series).
- The LED will light up due to short circuit, low impedance load (Only for MAC 2.4).

##### 5 SIGNAL LED

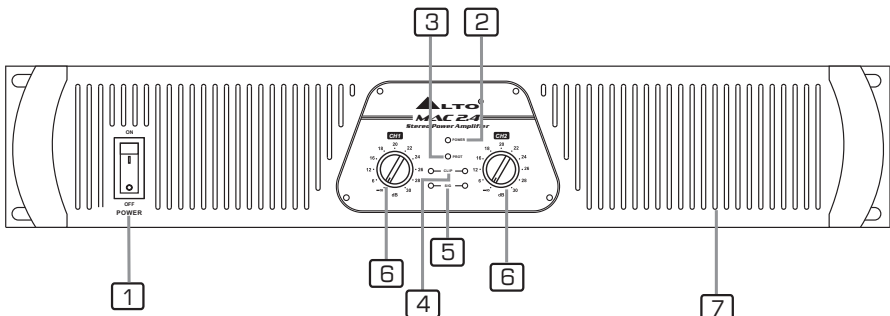
These LEDs will light up when the signal at the output is at least 100 mV.

##### 6 GAIN CONTROLS

These controls are used to adjust the output signal level.

##### 7 COOLING VENTS

The MAC 2 series amplifiers are equipped with two fans, which can accelerate the flow of air to low the temperature inside unit. The inside temperature determines the fan speed, which controls the inside air flowing speed.





## 3. CONTROL ELEMENTS

Rear Panel:

### 8 CIRCUIT BREAKER

This is an electronic fuse for protecting the unit from possible damage. When the unit is overloaded or the temperature inside the unit is too high, this push-type button will spring out and disconnect the power supply. Push the Breaker to restore normal working conditions.

### 9 IEC socket for AC power cable

Connect the supplied main cord. Do not insert the power cord into the MAC 2 series amplifier and into the AC Outlet until voltage has been correctly set.

### 10 XLR BALANCED INPUT CONNECTORS

Each Channel features balanced XLR and 1/4" jack sockets wired in parallel. The Balanced signals are less sensitive to hum noise generated by AC.

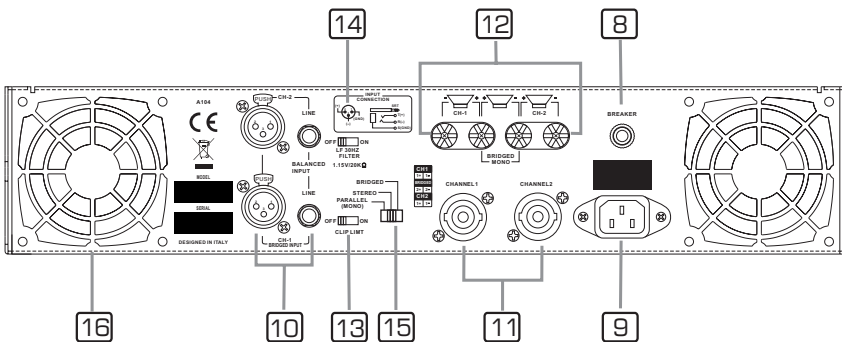
### 11 SPEAKON OUTPUTS (Channel 1 & Channel 2)

These connectors are specifically designed to connect high power speakers. The correct polarity is secured automatically, they prevent shock hazard and they lock-in securely.

### 12 BINDING POST OUTPUTS (Channel 1 & Channel 2)

Please make sure to respect the speaker polarity when using binding post.

**Caution:** turn off the unit before connecting an audio signal to the binding post to avoid any electric shock!







## 3. CONTROL ELEMENTS

### 13 CLIP-LIMITER SWITCH

If a very high level signal is driven into the amplifier, the output signal will "CLIP", that is the peaks of the waveform will be flattened. The Clip Limiter circuit automatically reduces the gain to prevent the overdrive. You can switch the Clip Limiter circuit ON and OFF via the (13) switch on the rear panel of your MAC 2 series. If you use full range speakers, the Clip Limiter circuit will reduce the high frequency distortion and it will also protect the high frequency drivers. However, some Users prefer to switch the Limiter OFF to get more punch from Kick Drums and other sounds in the low frequencies area.

### 14 LOW FREQUENCY FILTER

This Filter rolls off audio signals below 30 Hz. In this way bass performance will be improved, because the subsonic motion of the cone will be cut out and more power is made available to the woofer in the audible range of frequencies. If you want our view: Keep the Filter ON most of the time unless you are filtering the signal before the input of the MAC 2 series. Especially vented speakers (bass-reflex) are very sensitive to subsonic frequencies (below 30 Hz).

### 15 OUTPUT MODE SELECTOR

The MAC 2.2/2.3/2.4 stereo power amplifier presents three operating modes:

- Stereo Mode

In this mode, channel 1 and channel 2 operate independently (as a normal stereo amplifier). The channel 1 input signal will be output from the channel 1 output connector, and channel 2 input signal will be output from the channel 2 output connector:

- Parallel Mono Mode

In this mode, channel 1 input signal will be output from the output connectors of both channels. Detail wiring diagram you can refer to chapter 4.

- Bridged Mode

In this mode, channel 1 input signal will be output from the bridge-mono output connector. Detail wiring diagram you can refer to chapter 4.

### 16 COOLING FAN

This fan secures enough cooling for your MAC 2 series amplifier. The airflow is front-to-rear. The fan speed is electronically regulated depending on the temperature of the power devices.



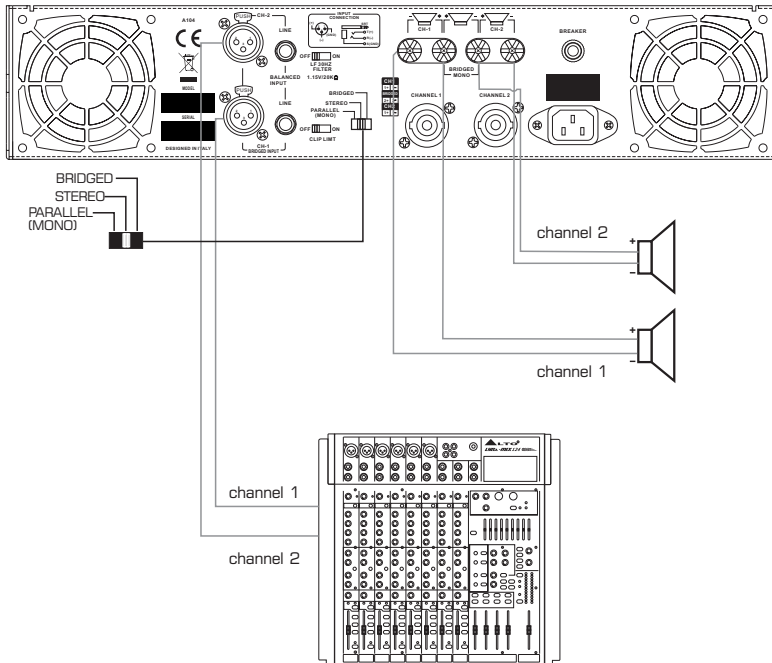
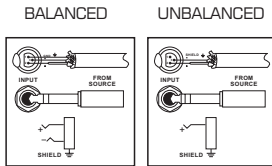
## 4. OPERATION

The MAC 2 series amplifiers provide three operating modes: stereo mode, parallel (mono) mode and bridged mode, you can decide each specific operating mode according to your actual application circumstance.

### Operate MAC 2 series in Stereo Mode

In this mode, channel 1 and channel 2 operate independently (as a conventional stereo amplifier). The channel 1 input signal will be output from the channel 1 output connectors, and the channel 2 input signal will be output from the channel 2 output connectors.

----- Input wiring tips -----





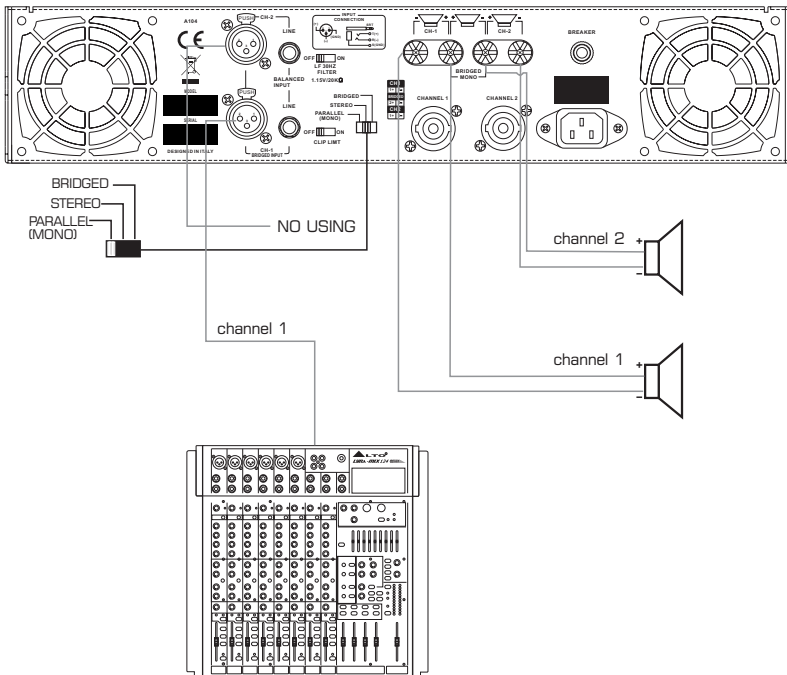
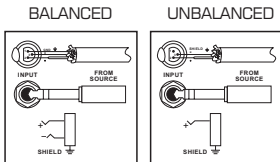
## 4. OPERATION

### Operate MAC 2 series in Parallel Mode

In this mode, the channel 1 input signal will be output from the output connectors of both channels. The channel 2 input jack is not used; the channel 1 and channel 2 volumes can be adjusted independently. Use the Parallel Mode when you want to drive two speakers with only one input signal keeping separate control of the volume of the two channels.

**NOTE:** since you are not using the channel 2 input you can use this socket to "daisy-chain" the signal to another amplifier:

----- Input wiring tips -----



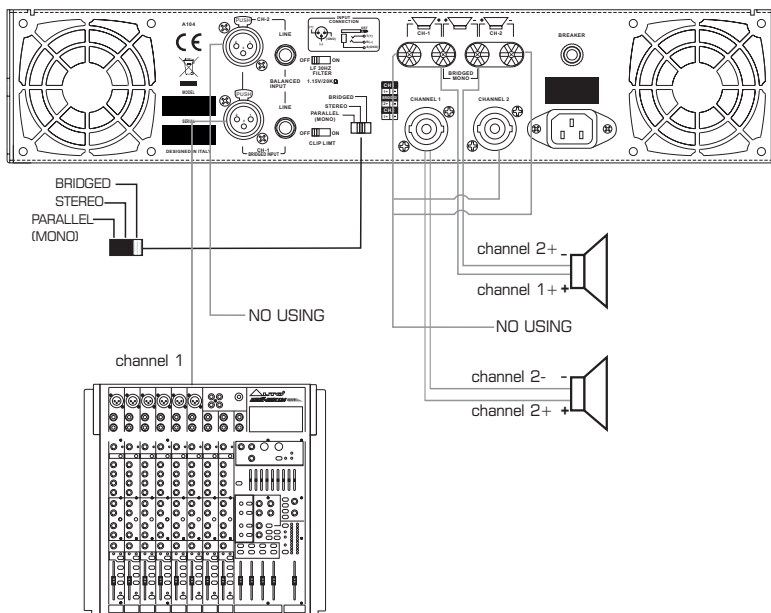
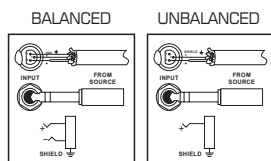


## 4. OPERATION

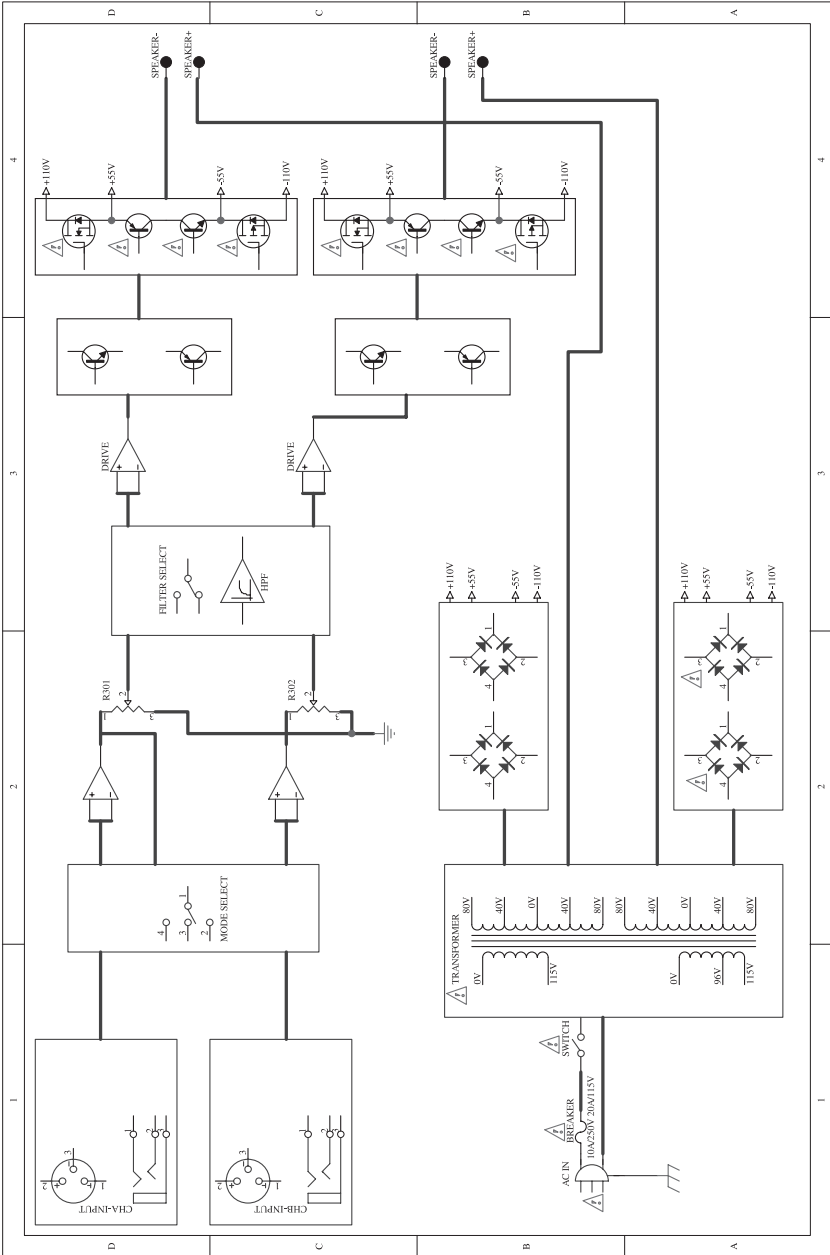
### Operate MAC 2 series in Bridged Mode

In this mode, the channel 1 input signal will be output from the bridge output connectors. ( The 2 RED binding post ) In this case, use the channel 1 volume control to adjust the volume, keep the volume control of channel 2 turned completely down ( counter clockwise ). Bridged mode is intended for driving loads with a total impedance of 4 ohms or greater. In Bridge Mode you will combine the power of both channels into one speaker. You will have available massive amount of power so check carefully the power handling of your speaker before operation.

-----Input wiring tips -----



# 5. BLOCK DIAGRAM



## 6. TECHNICAL SPECIFICATIONS

POWER SPECIFICATIONS		MAC 2.2	MAC 2.3	MAC 2.4
Stereo Mode (Both channels driven) 20Hz~20KHz	2 Ohms (EIAJ)	750 W X 2	1000 W	1800 W
	4 Ohms (RMS)	350 W X 2	510 W	900 W
	8 Ohms (RMS)	230 W X 2	285 W	560 W
Bridge Mono Mode 20Hz~20kHz	8 Ohms (RMS)	710 W	1000 W	1800 W
	4 Ohms (EIAJ)	1500 W	2200 W	3100 W
ELECTRICAL SPECIFICATIONS				
INPUT SENSITIVITY		1.15 V (+3.4 dBu)	1.15 V (+3.4 dBu)	1.15 V (+3.4 dBu)
INPUT IMPEDANCE		10 K $\Omega$ Unbalanced	20 K $\Omega$ Balanced	
FREQUENCY RESPONSE (at 10dB below rated output power)		25 Hz~25 KHz +0/-1 dB -3 dB points: 5 Hz~50 KHz		
VOLTAGE GAIN		30 dB	32dB	34 dB
DISTORTION(SMPTE-1M)		<0.03%	<0.03%	<0.03%
S/N ratio		100 dB	100 dB	100 dB
GENERAL SPECIFICATIONS				
PROTECTIONS		Full short circuit, open circuit, thermal, ultrasonic, and RF protection stable into reactive or mismatched loads, turn ON/OFF, muting, tripped crowbar		
CONTROLS		Front: AC switch, Input level control for each channel Rear: stereo/ parallel/ bridged selector, 30Hz filter selector clip ON/OFF selector.		
INDICATORS		SIGNAL: 2xgreen LED CLIP: 2xred LED POWER: 1 Blue LED PROTECTION: 1 red LED		
CONNECTORS		INPUT : Active balanced XLR and 1/4"(6.3 mm)TRS OUTPUT: "Touch-proof" binding posts and speak-on jacks.		
POWER SUPPLY		Available for 110-120 V or 220~240 V AC, 50/60 Hz		
DIMENSIONS		483(W)x460(D)x88.8(H)mm		
WEIGHT		13.6 kg	15.6 kg	20.55 kg

# 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 provide 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 West Road, Taichung 40151, Taiwan**  
**<http://www.altoproaudio.com> Tel: 886-4-22313737**  
**email: [alto@altoproaudio.com](mailto:alto@altoproaudio.com) Fax: 886-4-22346757**

All rights reserved to ALTO. All features and content might be changed without prior notice. Any photocopy, translation, or reproduction of part of this manual without written permission is forbidden. Copyright ©2007 Seikaku Group

NF03010-1.0