MAC 2.2/2.3/2.4
PROFESSIONAL STEREO AMPLIFIERS

www.altoproaudio.com
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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.

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
cautions 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:

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

According to OSHA, an exposure to high SPL in
excess of these limits may result in the loss of
hearing. 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.

This symbol, wherever used, alerts you to the
presence of uninsulated 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
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.

CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN
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
**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.
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.

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**
   - a. 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).
   - b. 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**
   - a. 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).
   - b. 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!
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 flattered. 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.
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.
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.

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*Input wiring tips*

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![Input wiring diagram](image-url)
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 ---

![Input Wiring Diagram]

--- Circuit Diagram ---

![Circuit Diagram]
### 6. TECHNICAL SPECIFICATIONS

#### POWER SPECIFICATIONS

<table>
<thead>
<tr>
<th></th>
<th>MAC 2.2</th>
<th>MAC 2.3</th>
<th>MAC 2.4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stereo Mode</td>
<td>2 Ohms (EIAJ)</td>
<td>750 W x 2</td>
<td>1000 W</td>
</tr>
<tr>
<td></td>
<td>4 Ohms (RMS)</td>
<td>350 W x 2</td>
<td>510 W</td>
</tr>
<tr>
<td></td>
<td>8 Ohms (RMS)</td>
<td>230 W x 2</td>
<td>285 W</td>
</tr>
<tr>
<td>Bridge Mono Mode</td>
<td>8 Ohms (RMS)</td>
<td>710 W</td>
<td>1000 W</td>
</tr>
<tr>
<td>20Hz~20kHz</td>
<td>4 Ohms (EIAJ)</td>
<td>1500 W</td>
<td>2200 W</td>
</tr>
<tr>
<td>20Hz~20kHz</td>
<td></td>
<td></td>
<td>1800 W</td>
</tr>
</tbody>
</table>

#### ELECTRICAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>Specification</th>
<th>MAC 2.2</th>
<th>MAC 2.3</th>
<th>MAC 2.4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INPUT SENSITIVITY</strong></td>
<td>1.15 V (+3.4 dBu)</td>
<td>1.15 V (+3.4 dBu)</td>
<td>1.15 V (+3.4 dBu)</td>
</tr>
<tr>
<td><strong>INPUT IMPEDANCE</strong></td>
<td>10 KΩ Unbalanced</td>
<td>20 KΩ Balanced</td>
<td></td>
</tr>
<tr>
<td><strong>FREQUENCY RESPONSE</strong></td>
<td>25 Hz~25 KHz +0/-1 dB</td>
<td>25 Hz~25 KHz +0/-1 dB</td>
<td>25 Hz~25 KHz +0/-1 dB</td>
</tr>
<tr>
<td>(at 10dB below rated output power)</td>
<td>-3 dB points: 5 Hz~50 KHZ</td>
<td>-3 dB points: 5 Hz~50 KHZ</td>
<td>-3 dB points: 5 Hz~50 KHZ</td>
</tr>
<tr>
<td><strong>VOLTAGE GAIN</strong></td>
<td>30 dB</td>
<td>32 dB</td>
<td>34 dB</td>
</tr>
<tr>
<td><strong>DISTORTION(SMPTE-1M)</strong></td>
<td>&lt;0.03%</td>
<td>&lt;0.03%</td>
<td>&lt;0.03%</td>
</tr>
<tr>
<td><strong>S/N ratio</strong></td>
<td>100 dB</td>
<td>100 dB</td>
<td>100 dB</td>
</tr>
</tbody>
</table>

#### GENERAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>Specification</th>
<th>MAC 2.2</th>
<th>MAC 2.3</th>
<th>MAC 2.4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PROTECTIONS</strong></td>
<td>Full short circuit, open circuit, thermal, ultrasonic, and RF protection stable into reactive or mismatched loads, turn ON/OFF, muting, tried crowbar</td>
<td>Full short circuit, open circuit, thermal, ultrasonic, and RF protection stable into reactive or mismatched loads, turn ON/OFF, muting, tried crowbar</td>
<td>Full short circuit, open circuit, thermal, ultrasonic, and RF protection stable into reactive or mismatched loads, turn ON/OFF, muting, tried crowbar</td>
</tr>
<tr>
<td><strong>CONTROLS</strong></td>
<td>Front: AC switch, Input level control for each channel</td>
<td>Front: AC switch, Input level control for each channel</td>
<td>Front: AC switch, Input level control for each channel</td>
</tr>
<tr>
<td><strong>INDICATORS</strong></td>
<td>SIGNAL: 2xgreen LED CLIP: 2xred LED</td>
<td>SIGNAL: 2xgreen LED CLIP: 2xred LED</td>
<td>SIGNAL: 2xgreen LED CLIP: 2xred LED</td>
</tr>
<tr>
<td><strong>CONNECTORS</strong></td>
<td>INPUT: Active balanced XLR and 1/4&quot;(6.3 mm)TRS</td>
<td>INPUT: Active balanced XLR and 1/4&quot;(6.3 mm)TRS</td>
<td>INPUT: Active balanced XLR and 1/4&quot;(6.3 mm)TRS</td>
</tr>
<tr>
<td><strong>POWER SUPPLY</strong></td>
<td>Available for 110-120 V or 220~240 V AC, 50/60 Hz</td>
<td>Available for 110-120 V or 220~240 V AC, 50/60 Hz</td>
<td>Available for 110-120 V or 220~240 V AC, 50/60 Hz</td>
</tr>
<tr>
<td><strong>DIMENSIONS</strong></td>
<td>483(W)x460(D)x88.8(H)mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>WEIGHT</strong></td>
<td>13.6 kg</td>
<td>15.6 kg</td>
<td>20.55 kg</td>
</tr>
</tbody>
</table>
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 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.