User's Manual

OEX600

ALTO®

SAFETY RELATED SYMBOLS

CAUTION
RISK OF ELECTRIC SHOCK DO NOT OPEN

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.

Disposing of this product should not be placed in municipal waste and should be Separate collection.

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.

TABLE OF CONTENTS

1. INTRODUCTION

Congratulations! Now you are the owner of the OEX600. The OEX600 is a plastic reinforced trolley that includes a versatile mixer with DSP effects, L&R full range speaker cabinets and sub-woofer. Besides, this package also includes some essential accessories such as power cord, signal cables, speaker cables, speaker stands and so on. In order to ensure high versatility and excellent audio performances, the OEX600 adopts optimal crossover frequency and advanced power amplifier technologies.

The L&R speaker cabinets are tightly hooked on the trolley. When you operate the OEX600, first of all take care of the setting of the L&R cabinets . It is the development of ALTO's experience and knowledge in speakers field, in order to faithfully reproduce sound for each kind of applications.

The sub-woofer is built-in into trolley. It contains a 12" low speaker, which delivers a natural and powerful sound and will bring you unprecedented low frequency emission from such a compact audio system.

Inlaid in OEX600 panel there's a compact extractable 6-channel mixer, which adopts 24-bit A/D&D/A converters and 24-bit DSP effects with accurate algorithms (16 presets). It also provides 5 MIC inputs with ultra low noise microphone pre-amplifiers and +48V PHANTOM power as well as warm, natural 3-band EQ; AUX send/return and 2TK in/out and so on.

In a word, it is ideally suited for live sound applications, small venues applications, live recording and many other musical purposes.

In order to get the best performances from your OEX600, we recommend you to thoroughly read this owner's manual before installation and operation.
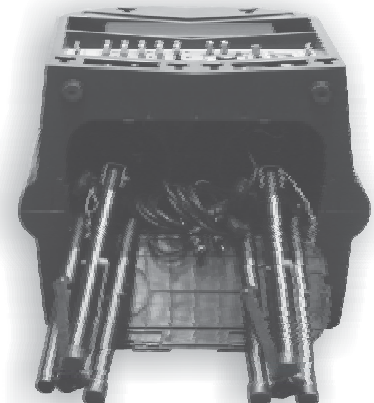
2. FEATURES

- Trolley appearance
- 2 (two-way satellite) + 1 (subwoofer) + 1 (6-channel mixer super combination)
- Three-way full-range speaker system with 12" subwoofer
- 5 XLR MIC input with ultra low noise microphone pre-amplifiers and +48V PHANTOM power
- 1 stereo LINE input
- Warm, natural 3-band EQ for each channel
- Precision level control
- 24-bit DSP effects with powerful algorithms (16 presets)
- Extremely high headroom offering excellent dynamic range
- Plastic reinforced cabinet (polypropilene)
- 600W Peak power, 300W RMS Power, three-Amp system -75W+75W for each satellite and 150W for subwoofer
- Two 7 m speaker cables
- Two F8 folding speaker stands
- Compartment for store following accessories:

Accessory List:

Folding speaker stands	2 $\times$ F8
Power cord	1 $\times$ IEC power cord
Signal cable	1 $\times$ 2m
Customized Speaker Cable	2 $\times$ 7m

In following picture you see OEX600 main components:

High quality L&R full range speaker cabinets
Powerful sub-woofer
Versatile multi-channel mixer

3. QUICK START

Though the OEX600 looks like a super formidable giant, you don't have to worry about how to carry it. As the OEX600 is equipped with two wheels, you can think of it as a trolley. Operating this unit, you will find out that it is really versatile and user-friendly. Following steps give you a guide line to set OEX600. Make all connections with the system powered off.

- First of all extract the F8 folding speaker stands from their compartment, as shown in Fig.1. Then unhook the L& R cabinets from the trolley in the right direction as shown in Fig.2.

  Note: Please remove the speakers in the right direction, unsuitable operation may damage your equipment. In order to prevent equipment damage, please place the speaker stands on a solid, even surface.

Fig.1   Fig.2

- Fix the L&R speaker cabinets on their stands, as shown in Fig 3.

  Note: Position the speakers facing the audience and, in order to avoid feedback, far away from the microphones.

- Then, properly position the sub-woofer(trolley).

Fig.3

- Depending on application requirements, you can disassemble or not the mixer from the trolley. For this application is supplied a 2m. signal cable, as shown in Fig.4.

Fig.4

- Now you can setup the system.

  Note: Make all initial connections with the system powered off, and, in order to avoid damaging your speakers and to have too much noise, with mixer main mix volume control completely turned down.

- Connect one side of the speaker cable to the left/right power outputs (1/4"TS jacks) of system, and the other side to the L/R speakers cabinet (1/4"TS jacks), as shown in Fig.5.
  Warning! Do not connect additional speakers to the powered output. The system speakers provide the optimal load for the built-in amplifier. In order to avoid damaging your built-in amplifier, please pay attention to speaker impedance.

Fig.5

- Connecting Microphone, CD players, Tape, MD player (Line sources) etc. to the appropriate MIC/LINE mixer input connector (XLR/1/4"TRS jacks), as shown in Fig.6.

Fig.6

- Now you can turn on the power switch.

- Turn up the volume control, use the PFL function to get the proper input level for each mixer channel, then adjust the main mix level control to manage the output level.

- At the end of your session, put all your levels to zero, turn off your system, then collect all the cables and put back in their places all accessories into their own storage compartment. Finally, lay the speakers face down on top of the trolley and secure the six latches. Now the OEX600 is ready to be safely carried.

- The following figure(Fig.7) gives you a representation of connection / installation of your sound reinforcement system. In order to get the best results and equipment durability, please be careful during all the former operations.
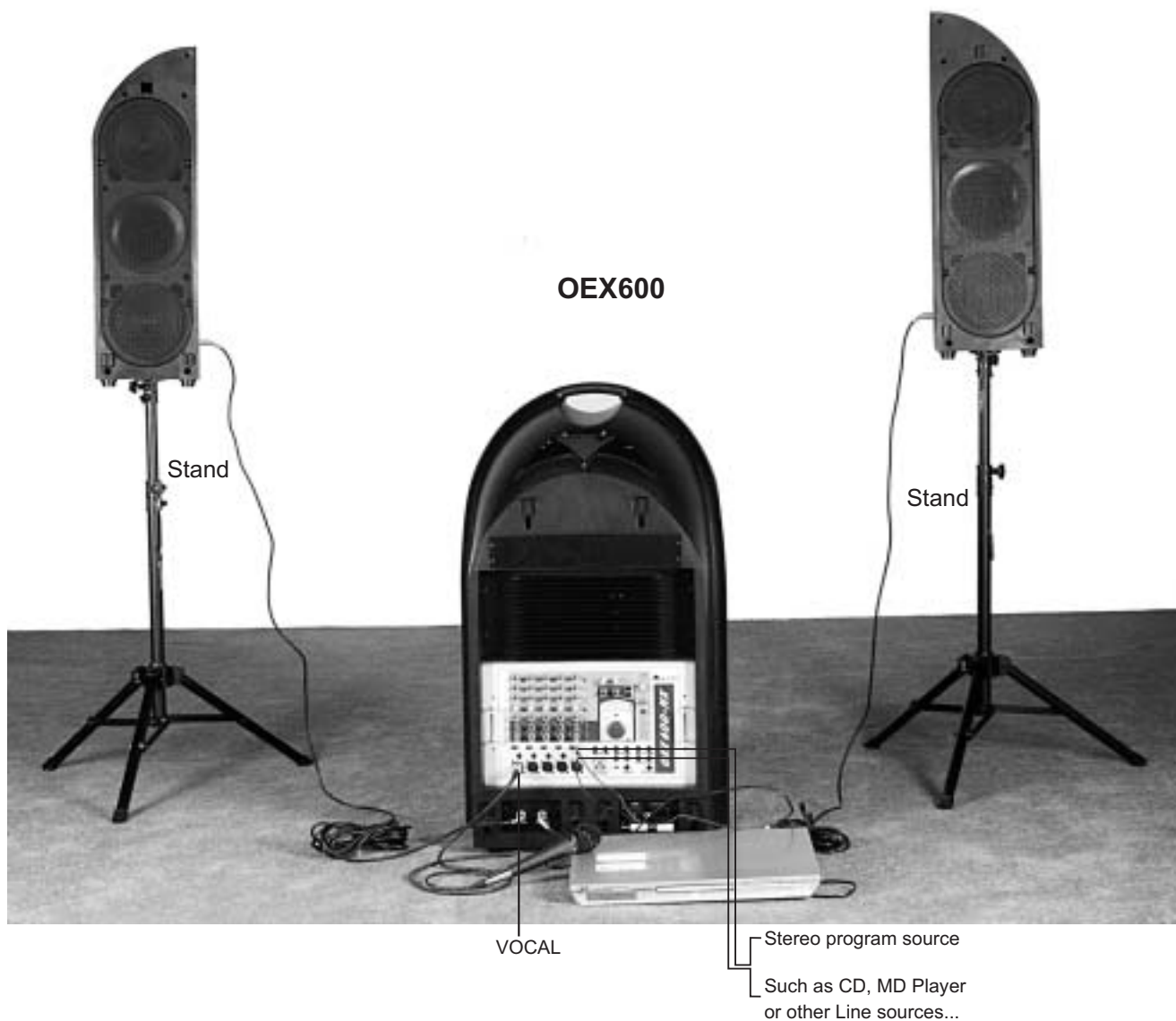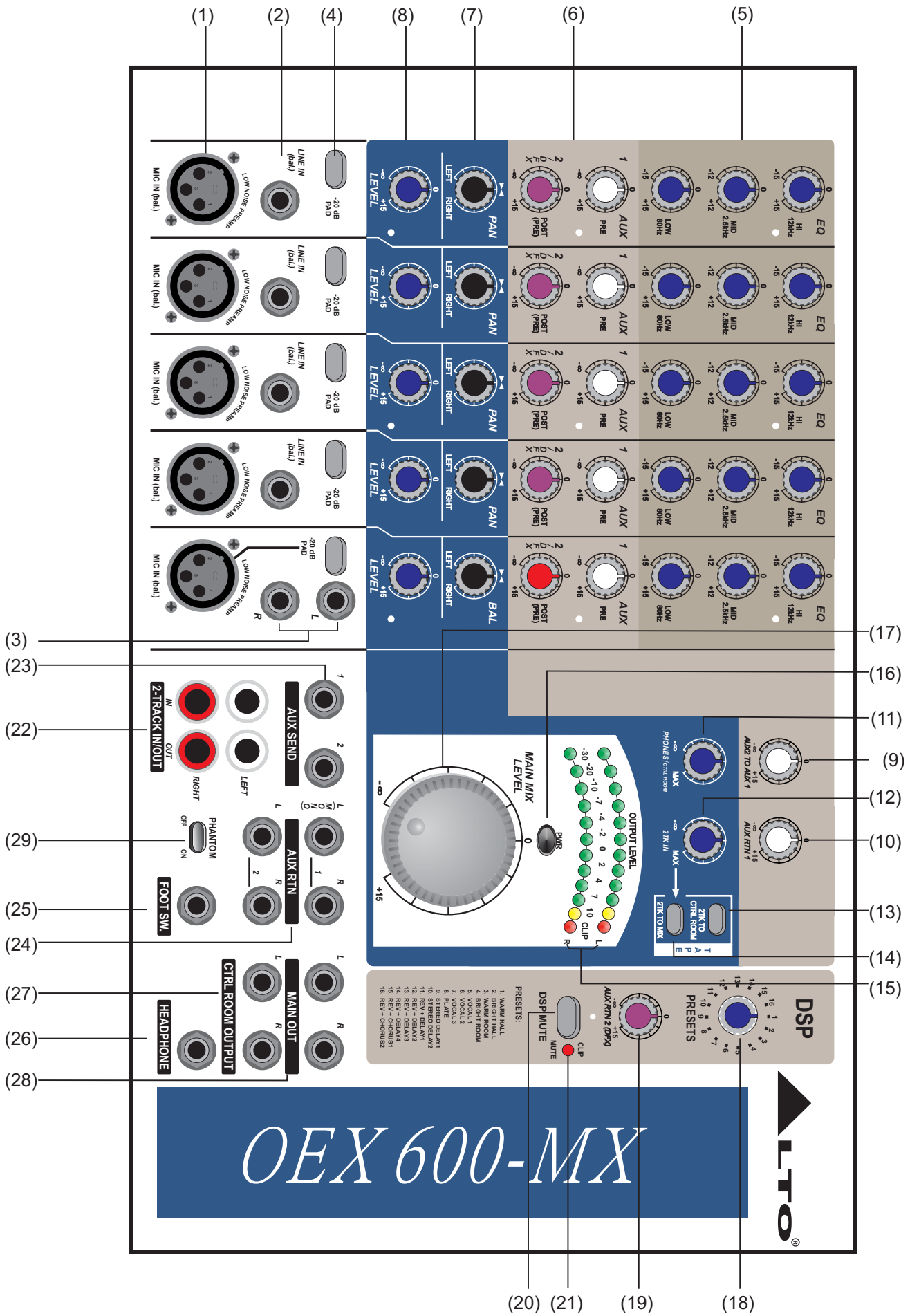

OEX600

Stand

Stand

VOCAL

Stereo program source

Such as CD, MD Player or other Line sources...

Fig.7

4. CONTROL ELEMENTS

OEX 600-MX

(1). MIC IN

These electronically balanced XLR sockets have been designed to accept microphone signals, providing low noise microphone pre-amplifier, as well as phantom power for condenser microphone when pushing ON the PHANTOM power switch.

Note: You shall never connect an unbalanced microphone to the XLR socket if you don't want to damage both the microphone and mixer.

(2). LINE IN

These balanced 1/4"TRS jacks have been designed to accept line level inputs such as keyboards outputs, CD players, MD/tape outputs, etc...

(3). Stereo Input

This channel is equipped with two1/4"TRS jacks for stereo input. Connecting the left input jack only, the input will operate in mono mode.

(4). -20dB PAD

Pressing this button the input signal will be attenuated by 20dB. In such way you'll obtain increased headroom simultaneously reducing the risk of distortion due to input level peaks with too high input signals.

(5). Equalizer

Each channel is equipped with 3-band warm, natural EQ: HI, MID and LOW bands, which allows to shape the sound of program material in a very efficient way.

HI

Treble control. You can use it to get rid of high frequency noises or to boost the sound of cymbals or human voice high harmonics. The gain range can be varied from -15dB to +15dB with a center frequency of 12kHz.

MID

Midrange control. It can affect most fundamental frequencies of all musical instruments and human voice. A careful use of this control will provide you an interesting panorama of sound effects. The gain range can be varied from -12dB to +12dB with a center frequency of 2.5kHz.

LOW

Bass control. It can boost male voice or kick-drum and bass guitar. Your system will seem much bigger than what it is. The gain range can be varied from -15dB to +15dB with a center frequency of 80Hz.

(6). AUX Sends

Both these controls are used to adjust the level of signal sent to AUX buses. These sends controls are adjustable in -∞ to +15dB range.

The AUX1 control is configured PRE-FADER, it means that the signal is independent by channel fader setting. It is suited to be used as monitor mix in a live sound mixing, or for headphone mix in recording application.

The AUX2 control is configured as POST-FADER, it means that the audio signal will be affected by channel fader. This signal is assigned to onboard DSP (digital effects module). Via the AUX2 OUT jack, the AUX2 signal can also be assigned to an external effect device.

(7). PAN/BAL Control

It controls the channel signal position between left and right in the stereo bus. Of course you can use it also to "move" the channel signal in stereo front to create spatial effects.

(8). LEVEL Control

This pot provides smooth level changes control.

(9). AUX2 TO AUX1 Control

This control adjusts the amount of the signal from AUX REUTRN2 to AUX SEND1 in a range from -∞ to +15dB.

(10). AUX RTN1 Control

This control adjusts the amount of AUX RETURN1 signal to master in -∞ to +15dB range.

(11). PHONES/CTRL ROOM Control

    It adjusts control room speakers and headphones volume.

(12). 2TK IN Control

    This pot adjusts the level of 2TK IN signal.

(13). 2TK TO CTRL ROOM Switch

    Engaging this button the 2TK IN signal will be routed to control room output.

(14). 2TK TO MIX Switch

    Engaging this button the 2TK IN signal will be routed to the main mix output.

(15). OUTPUT LEVEL LED Display

    The stereo 12-segments LED meter indicates the signal level sent to CTRL ROOM and PHONES outputs.

(16). PWR LED Display

    It indicates the OEX600 is powered on.

(17). MAIN MIX LEVEL Dial

    Rotating this dial you will to adjust the overall volume of the left and right main mix outputs. The adjustable range is from -∞ to +15dB.

(18). PRESETS Control

    Through this knob you can select the effect that you desire to use.

    There are16 effects options to choose from: several kinds of reverb, effects with modulation, and some versatile two-effect combination. Please refer to chapter 5.

(19). AUX RTN2 (DFX) Control

    This pot adjusts the signal coming from an external/internal effect device in -∞ to +15dB range.

(20). DSP MUTE Switch

    This switch is used to activate/deactivate the built-in effect section.

(21). CLIP LED

    This LED lights up when the input signal is too strong. This LED is lit also when the built-in digital effect section is muted.

(22). 2 TRACK IN/OUT

    These RCA connectors can be used to connect the output/input of a DAT, cassette or tape recorder.

(23). AUX SEND

    These two1/4" phone jacks output the line signal from the AUX bus.

(24). AUX RTN

    These four1/4" phone jacks return the signal from external effect units to the main mix bus, you can also use these connectors as line level extra inputs. AUX RETURN2 is connected to internal DSP output, but this path will be broken inserting external signal connectors to AUX RETURN2 socket.

(25). FOOT SW.

    This 1/4" phone jack can be used to connect an external foot-switch to turn on/off the built-in effect module.

(26). HEADPHONE

    This 1/4" stereo phone jack is used to connect the stereo headphones.
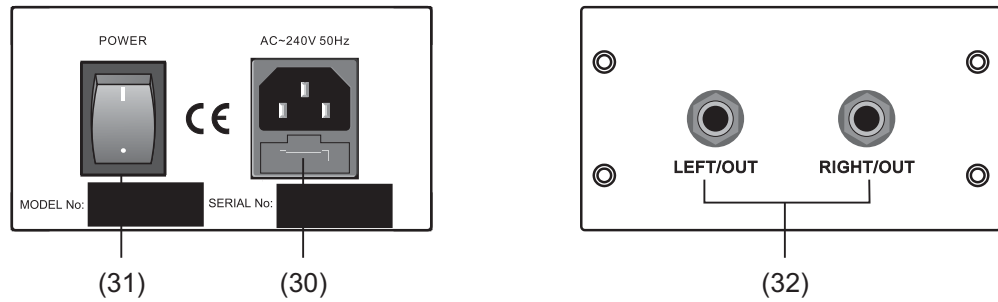
(27). CTRL ROOM OUTPUT

    Left and right control room output connectors, to connect a control room monitoring system.

(28). MAIN OUTPUT

These connectors output left and right main mix. You can use these connectors to output the main mix signal to an external PA system or active speakers.

(29). PHANTOM Switch

Via this switch, you can turn on/off the +48V phantom power for all microphone pre-amps.

(30). AC INLET with FUSE HOLDER

This standard IEC receptacle is supplied to allow to connect your OEX600 to mains via the supplied power cord.

(31). POWER Switch

It switches on/off the OEX600 main power.
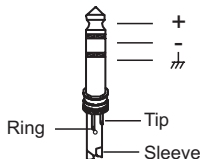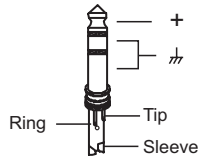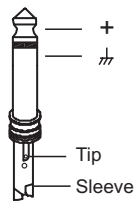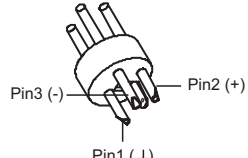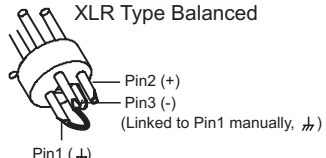
(32). Powered Output Connectors

These 1/4" phone jacks are used to output the powered signal to L&R speaker cabinets.

5. PRESET LIST

No.	Preset	Description	parameter
1	WARM HALL	Simulate a small acoustic space of the sound.	Rev. Decay time: 360ms Pre-delay: 45ms
2	BRIGHT HALL	Simulate a large acoustic space of the sound.	Rev. decay time: 290ms Pre-delay: 23ms
3	WARM ROOM	Simulate a small acoustic space of the sound.	Rev. decay time: 210ms Pre-delay: 45ms
4	BRIGHT ROOM	Simulate a studio room with many early reflections.	Rev. Decay time: 210ms Pre-delay: 23ms
5	VOCAL 1	Simulate a room with without delay time.	Rev. decay time: 450ms
6	VOCAL 2	Simulate a room with small delay time.	Rev. decay time:240ms Pre-delay: 25ms
7	VOCAL 3	Simulate a small space with slight decay time.	Rev. decay time:100ms Pre-delay: 114ms
8	PLATE	Simulate the transducers sound like classic bright vocal plate.	Pre-delay: 10ms Rev. decay time: 290ms
9	STEREO DELAY 1	Recreate the input sound on the stereo output with different time.	Period: 352ms
10	STEREO DELAY 2	Recreate the input sound on the stereo output with different time.	Period: 238ms
11	REV + DELAY 1	Delay with room effect.	Delay period: 326ms Rev. decay time: 290ms
12	REV + DELAY 2	Delay with room effect.	Delay period: 211ms Rev. decay time: 240ms
13	REV + DELAY 3	Delay with room effect.	Delay period: 375ms Rev. decay time: 210ms
14	REV + DELAY 4	Delay with room effect.	Delay period: 277ms Rev. decay time: 150ms
15	REV + CHORUS1	Simulate the sound effect achieved by rotating horn speakers and a bass cylinder.	Chorus rate: 3.67Hz Rev. decay time: 290ms
16	REV + CHORUS2	Simulate the sound effect achieved by rotating horn speakers and a bass cylinder.	Chorus rate: 3.02Hz Rev. decay time: 150ms

6. OEX600 WIRING GUIDE

Defective wiring may degrade the performance of OEX600 so, please, use good quality screened audio cables only. Please follows the descriptions below to interface OEX600 without experiencing and noise or signal lose.

Model	Input/Output Connector	Type	Description	Diagram
Mixer Section	MIC IN	XLR	PIN1 = Screen / Ground PIN2 = Hot Signal PIN3 = Cold Signal	• **1/4" jack** TRS Type Balanced
	LINE IN	1/4" jack TRS	TIP = Hot RING = Cold SLEEVE = Screen	
	AUX SEND	1/4" jack TS	TIP = Hot SLEEVE = Screen	TRS Type Unbalanced
	TAPE IN	RCA	TIP = Hot SLEEVE = Screen	
	TAPE OUT	RCA	TIP = Hot SLEEVE = Screen	TS Type Unbalanced
	MIX OUT	1/4" jack TRS	TIP = Hot RING = Cold SLEEVE = Screen	• **RCA Connector**
	HEADPHONE	1/4" jack TRS	TIP = Hot RING = Cold SLEEVE = Screen	
	POWER CONNECTOR	SCM	PIN1= AC IN (+18V) PIN2= PGND PIN3= AC IN (-18V) PIN4= OUT - GND PIN5= SUB OUT PIN6= L OUT HI PIN7= R OUT HI PIN8= C - GND	• **SCM** • **XLR connector** Pin3 (-) Pin2 (+) Pin1
Speaker Section	SPEAKER IN	1/4" Jack TS	TIP = Hot SLEEVE = Screen	XLR Type Balanced
Main Output Section	POWERED OUTPUT	1/4" Jack TS	TIP = Hot SLEEVE = Screen	Pin2 (+) Pin3 (-) (Linked to Pin1 manually) Pin1 XLR Type Unbalanced

7. TECHNICAL SPECIFICATIONS

- **Mixer Section**

Mono input channels		
	Microphone Input	Electronically balanced, discrete input configuration
	Frequency response	10Hz to 55kHz,+/- 3dB
	Distortion(THD&N)	0.04% at +4dBu,1kHz
	Gain	35dB
	SNR(Signal to Noise Ratio)	>94dB
	Line input	Electronically balanced
	Frequency response	10Hz to 55kHz,+/- 3dB
	Distortion(THD&N)	0.04% at +4dBu,1kHz
	Gain	15dB
Stereo input channels		
	Line input	Unbalanced
	Frequency response	10Hz to 55kHz,+/- 3dB
	Distortion(THD&N)	0.04% at +4dBu,1kHz
Impedances		
	Microphone Input	1.4kOhm
	Channel Insert return	2.5kOhm
	All other inputs	10kOhm or greater
	Tape out	1kOhm
	All other outputs	120Ohm
Equalization		
	Hi shelving	+/-15dB@12kHz
	Mid bell	+/-12dB@2.5kHz
	Low shelving	+/-15dB@80Hz
DSP Section		
	A/D and D/A converters	24bit
	DSP resolution	24bit
	Type of effects	REVERBS,Stereo DELAY,Chorus
		REV+DELAY,and REV+CHORUS combinations
	Presets	16
	Controls	16-position PRESET selector
		CLIP LED
		MUTE SWITCH with LED indicator
Main Mix Section		
	Noise(Bus noise)	Fader 0 dB,channels muted:-85dBr (ref.:+4dBu)
		Fader 0 dB,all input channels assigned and set to UNITY gain:-81dBr(ref.:+4dBu)
	Max output	+27dBu balanced
		+22dBu unbalanced, 1/4" jacks
	AUX Sends max out	+22dBu

- **Speaker Section**

3-Way Powered System	Bi-Amp plus passive crossover into Satellite
Low Output Power	150W(RMS) @4hm , 162W(EIAJ) @4hm Class AB
MID-HIGH Output Power	75W *2(RMS) @8hm, 165W(EIAJ) @8hm Class AB
Peak Power Rating	600W Peak
Max SPL at 1mt	116.5dB Continuous - 119.5dB Peak (calculated)
Frequency response	55Hz- 20kHz @ -10dB
Impedance Low-Mid/High	Low 8ohm - Mid/High 8ohm
Crossover Frequencies	Active 125Hz at 12dB/Oct - Passive 3000Hz at 12dB/Oct with Electronic Dynamic Protections.
Amplifier Protections Low-Mid/High	Soft Start - Short Circuit - DC output voltage -Thermal Protection - Subsonic Filter at 30Hz - 24dB/Oct. - Limiter / Compressor.
Low Frequency Device	12" / 318mm - 2" Voice Coil
Mid Frequency Device	2 x 6.5" / 165mm - 1" Voice Coil
High Frequency Device	1" Compression Driver - 1" Voice Coil
Horn Coverage H°x V°	80°H x 80°V
Plastic Reinforced Cabinet	Polypropilene

- **Physical**

Dimension(W*D*H)	1060*700*700mm
Net Weight	43.04kg
Gross Weight	60.04kg

8. WARRANTY

7.1 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.

7.2 RETURN NOTICE

a. 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.

b. 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.

c. A brief description of the defect will be appreciated.

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

3. TERMS AND CONDITIONS

a. ▲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.

b. 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.

c. 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.

d. 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.

e. 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.

f. 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.