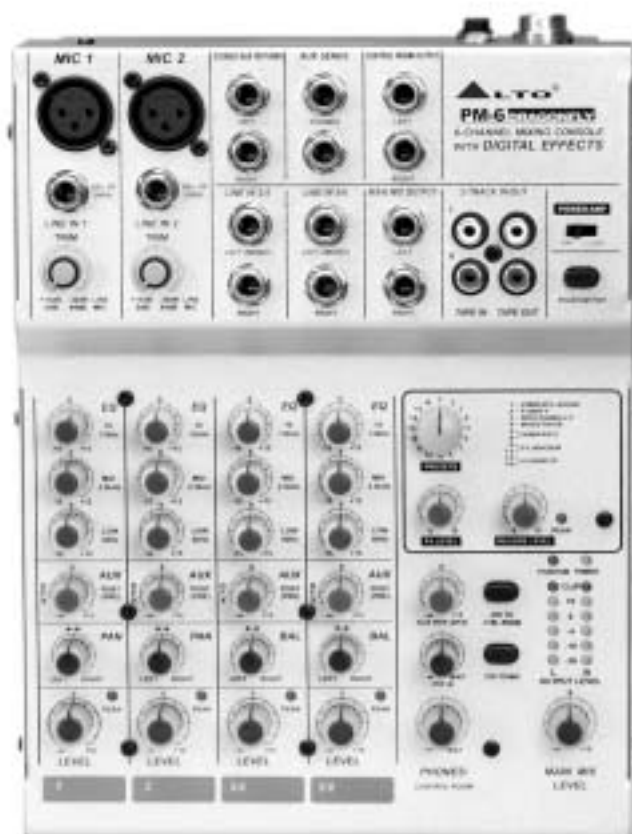


PM-6 DRAGONFLY

User's Manual

6-CHANNEL MIXING CONSOLE
WITH DIGITAL EFFECTS



www.altoproaudio.com

Version 1.1 April 2005

— 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:

Thank you for choosing the ▲LTO PM-6 DRAGONFLY 6-Channel Mixing Console with Digital Effects, which is the result of our ▲LTO AUDIO TEAM's endeavours.

For the ▲LTO AUDIO TEAM, music and audio are more than a profession, it is a passion and an obsession!

We have, in fact, been designing professional audio products for a number of years in cooperation with many of the world's major brands.

The ▲LTO line represents unparalleled analogue and digital products made by musicians, for musicians. With our design centres in Italy, the Netherlands, and the United Kingdom we provide you with world-class designs, while our software development teams continue to develop an impressive range of audio specific algorithms.

By purchasing our ▲LTO products you become the most important member of our ▲LTO AUDIO TEAM. We would like to share with you our passion for what we design and invite you to make suggestions, which will aid us in developing future products for you. We guarantee you our commitment for quality, continual research and development, and of course the best prices.

The ▲LTO PM-6 is an extremely flexible, ultra-low noise 6-Channel Mixing Console with Digital Effects, which is the smallest among our range of mixing consoles with digital effects. It is configured with 2 mono and 2 stereo input channels, each channel is equipped with a variety of key features including a warm, natural sounding EQ, Peak LED and PAN/BAL control etc..seeing is believing, let's meet the ▲LTO PM-6

We would like to thank all the people who made the ▲LTO PM-6 DRAGONFLY 6-Channel Mixing Console with Digital Effects possible, especially to our designers and ▲LTO staff. It is their passion for music and professional audio that has made it possible for us to offer you, our most important team member, our continued support.

Thank you very much

▲LTO AUDIO TEAM

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1. INTRODUCTION

Thank you very much for expressing your confidence in ▲LTO products by purchasing PM-6 DRAGONFLY 6-Channel Mixing Console with Digital Effects. The PM-6 is a professional compact mixer, which Provides the state of the art digital amplifier technology specifically. You will get the smooth, accurate more natural and open sound from this apparatus, and it is really ideal for small gigs, recording and fixed PA installations. The PM-6 DRAGONFLY 6-Channel Mixing Console with Digital Effects is packed with features that can not be found in other consoles of it size: 2 mono (these are provided With ultra low noise microphone preamplifiers and Phantom Power at +18 Volt) and 2 stereo input channels, and each of them is provided with a 3 bands equalizer for HI, MID and LOW controls; built-in high efficiency power amplifier and effects processor; highly accurate 6-segment bar graph meters and 2-Track inputs assignable to main mix, control room / headphone outputs.

Your PM-6 DRAGONFLY is very easy to operate but we advise you to go through each section of this manual carefully. In this way you will get the best out of your PM-6 DRAGONFLY.

2. FEATURES

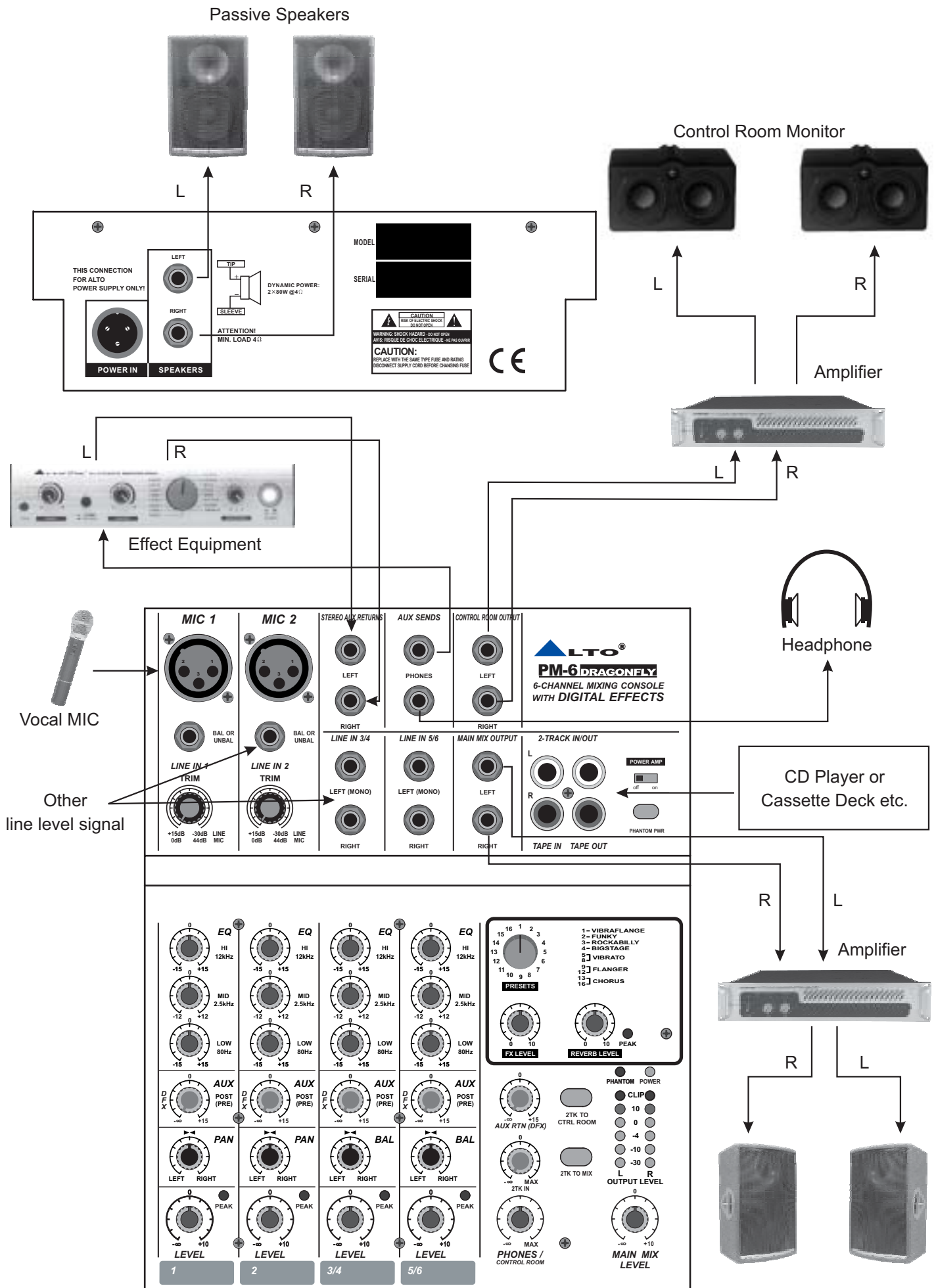
The PM-6 DRAGONFLY 6-Channel Mixing Console with Digital Effects is designed for professional application. It provides the following features:

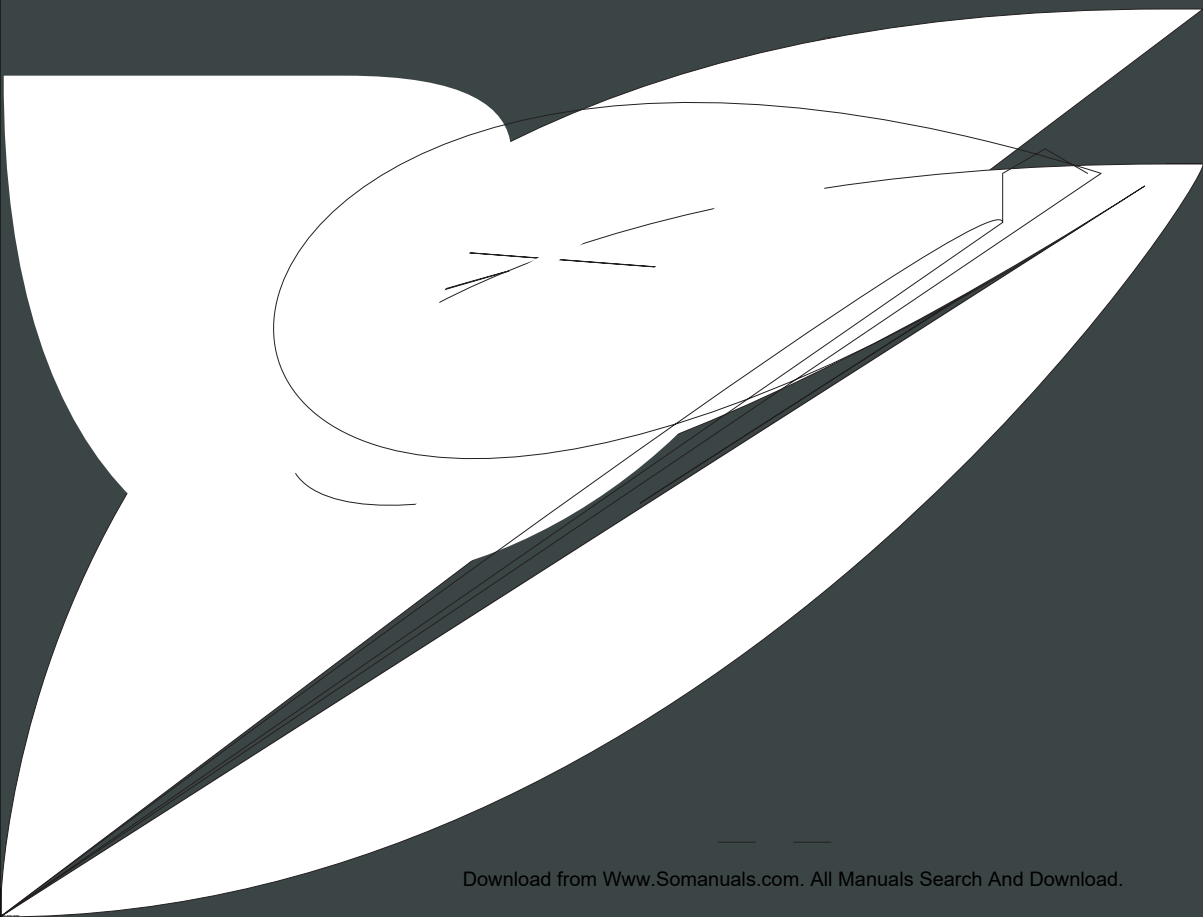
- Built-in high efficiency power amplifier and digital effects processor
- 2 MIC input channels with gold plated XLR and balanced LINE inputs
- 2 stereo input channels with balanced TRS jacks
- Ultra-low noise discrete MIC pre-amps with +18V phantom power
- Extremely high headroom offering more dynamic range
- Warm, natural 3-band EQ on each channel
- Peak LED on each channel
- AUX control per channel for external and internal onboard effect.
- 2-Track inputs assignable to main mix, control room / headphone outputs
- Highly accurate 6-segment bar graph meters
- DYNAMIC POWER:2×80W@4Ohm

3. READY TO START

- 3.1 There is a small black box provided with your PM-6 DRAGONFLY. This is the specific power supply box. Connect the proper terminal into your PM-6 DRAGONFLY and the power supply box into an AC socket.
- 3.2 Be sure the main power switch is turned off before connecting the Mixer to the power supply box. Also, you should make Sure that all Input and Output Controls are turned down. This will avoid damages to your speakers and avoid excessive noise.
- 3.3 Before connecting and disconnecting the power supply box always turn off your external power amplifier (if used in a sound system).
- 3.4 Do not use solvents to clean your PM-6 DRAGONFLY. A dry and clean cloth will be OK.

3.5 Possible System Connection Mode for Live Sound Application





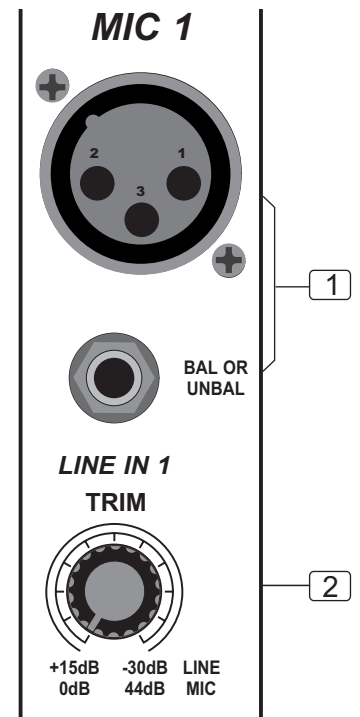
4.1 The MONO MIC/LINE CHANNELS

1

These are Channel 1 and Channel 2. You can connect a balanced, low impedance microphone to the XLR socket. ON the 1/4" phone jack you can connect either a microphone or a line level instrument. You shall never connect an unbalanced microphone to the XLR socket if you do not want to damage both the Microphone and the Mixer.

18 Volt Phantom power

It is available only to the XLR input sockets. Do not connect non-phantom equipment to the MIC input when phantom power is on. Before turning phantom power on, make sure that all faders are all the way down. In this way you will protect your stage monitors and main loudspeakers.



4.2 INPUT LEVEL SETTING

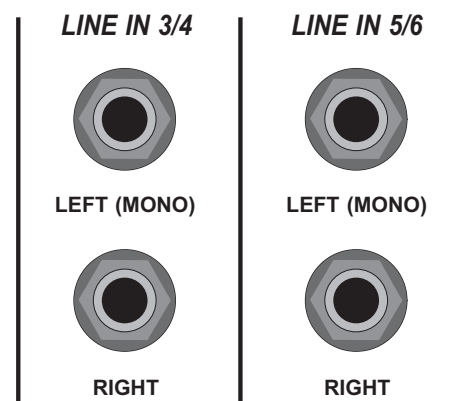
2

This control is provided with 2 different indication rings: one is for the microphone and the other for the LINE input. When you use a Microphone you shall read the OUTSIDE ring (0~44dB); when you use a line level instrument you shall read the INSIDE ring (+15~-30 dB). For optimum operation you shall set this control in a way that the PEAK LED will blink only occasionally in order to avoid distortion on the input channel.

4.3 STEREO INPUT

3

These are channel 3 though 6 . They are organised in stereo pair and provided with 1/4"TRS phone sockets. If you connect only the left jack, the input will operate in mono mode.



3

4.4 3-BAND EQUALIZER

3-band equaliser is provided for all input channels with a wide range of frequency adjustment.

- HI 4

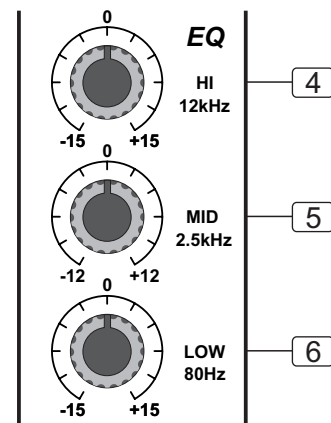
This is the treble control. You can use it to get rid of high frequency noises or to boost the sound of cymbals or the high harmonics of the human voice. The gain range goes from -15dB to +15dB with a center frequency of 12kHz.

- MID 5

This is the midrange control. It can affect most fundamental frequencies of all musical instruments and human voice. An attentive use of this control will give you a very wide panorama of sound effects. The gain range goes from -12dB to +12dB and the center frequency is 2.5kHz.

- LOW 6

This is the bass control. Boost male voice or kickdrum and bass guitar. Your system will sound much bigger than what it is. The gain range goes from -15dB to +15dB and the center frequency is 80Hz.



4.5 AUX 7

This control is used to adjust the level of respective channel signal sent to the Auxiliary Bus. The configuration is post-fader so the signal sent to the AUX Bus will be affected by the LEVEL control of that particular channel. In this typical compact unit, the channel signal is not only assigned to external effect or processor equipment directly but also to internal onboard effect module.

Note: There is the possibility to configure this AUX Send as Pre-fader as we will explain later in this manual.

4.6 PAN 8

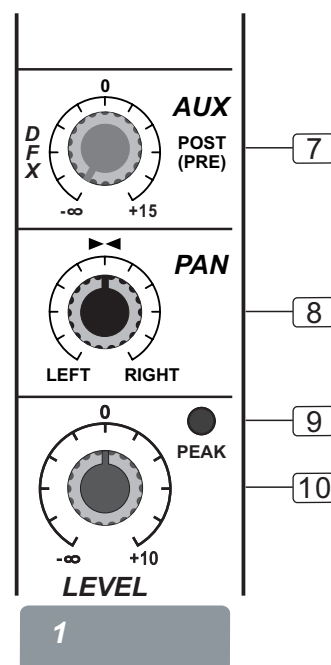
This is the PANORAMA control, or balance control. You can adjust the stereo image of the signal via this control. Keep this control in center position and your signal will be positioned in the middle of stage. Turn this control fully counterclockwise and the signal will be present only on the left speaker and vice-versa. Of course a large number of intermediate positions is available.

4.7 PEAK LED 9

Inside your mixer the audio signal is monitored in several different stages and then sent to the PEAK LED. When this LED blinks, it warns you that you are reaching signal saturation and possible distortion. The PEAK LED will blink with a level that is 6dB before actual clipping.

4.8 LEVEL 10

This control will adjust the overall level of this channel and set the amount of signal sent to the Main output.



4.9 MASTER SECTION

- MAIN MIX LEVEL 11

This control sets the amount of signal simultaneously sent to the MAIN MIX OUTPUT and TAPE OUT.

- PHONES/CONTROL ROOM 12

This control sets the amount of signal simultaneously sent to the CONTROL ROOM OUTPUT and PHONES.

- LED METER 13

This stereo 6 segments LED Meter will indicate the signal level sent to CONTROL ROOM and PHONES outputs.

- 2-TRACK signal path 14

If you push down the 2TK TO CONTROL ROOM button, the 2 TRACK IN signal will be routed into the CONTROL ROOM OUTPUT and the level will be adjusted by the PHONES/CONTROL ROOM knob.

If you push down the 2TR TO MIX button, the 2 TRACK IN signal will be routed into the MAIN MIX OUTPUT and will be adjusted by the MAIN MIX LEVEL knob.

Note: you can push down these two buttons simultaneously, the 2 TRACK IN signal will be routed into both CONTROL ROOM OUTPUT and MAIN MIX OUTPUT, and the level of two output signals will be adjusted by respective control knob.

- AUX RTN 15

This control is used to adjust the level of signal coming from external/internal effect processor. The signal of the AUX RETURN will be sent to MAIN MIX OUTPUT.

- 2TK IN 16

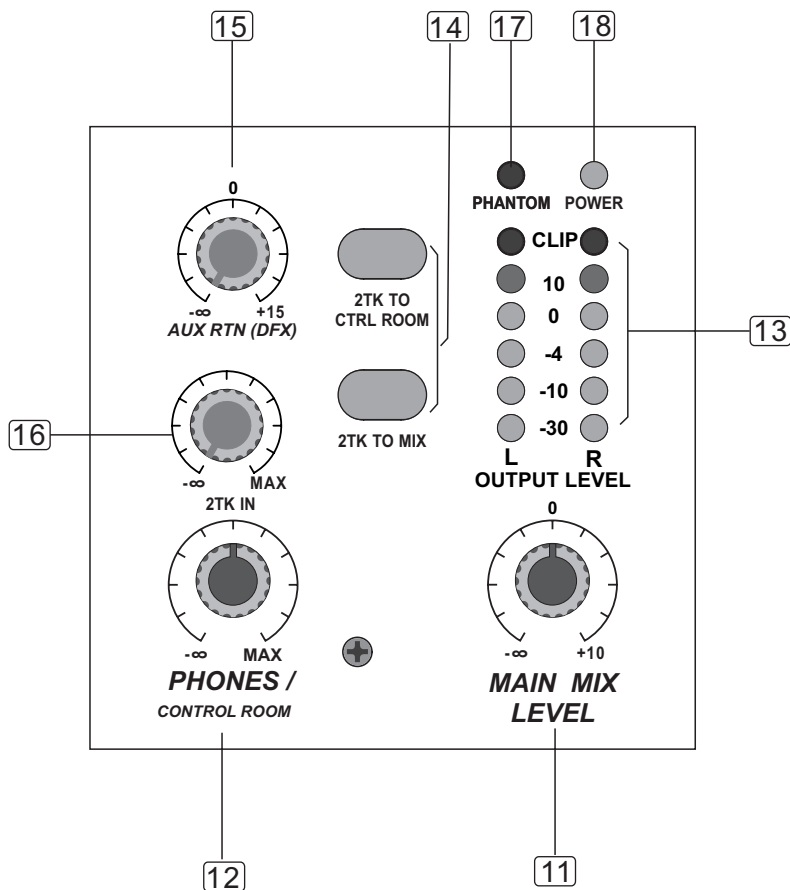
This control is used to adjust the level of 2TK IN, which can be varied from $-\infty$ to MAX.

- PHANTOM LED 17

This LED indicates when the PHANTOM POWER is switched on.

- POWER LED 18

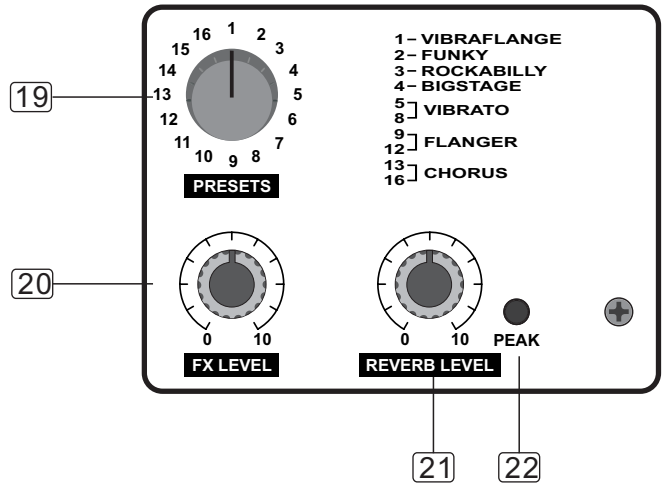
This LED indicates when the Power is on in your PM-6 DRAGONFLY.



- 24 BIT DIGITAL EFFECTS

- PRESETS 19

Adjust this knob to select the right effect you wish to perform. There are total 16 options for you: Vibraflange, Funky, Rockabilly, Bigstage, Vibrato, Flanger and Chorus etc.



- FX LEVEL control 20

This control is used to adjust the output level of FX signal, which can be varied from 0dB to 10dB.

- REVERB LEVEL control 21

This control is used to adjust the output level of REVERB signal, which can be varied from 0dB to 10dB.

- PEAK LED 22

This LED lights up when the input signal is too strong.

- MAIN MIX OUTPUT 23

This stereo output is controlled by the MAIN MIX LEVEL and will send the audio signal to an external amplifier. The output level can be varied from -∞ to +10dB

- 2-TRACK IN/OUT

TAPE IN 24

Use the Tape input if you wish to listen to your mixer from a Taper Recorder or DAT. You can send the signal coming from the Taper Recorder(or DAT) either to CONTROL ROOM OUTPUT and/or to the MAIN MIX OUTPUT by using relative 2TK TO select button.

TAPE OUT 25

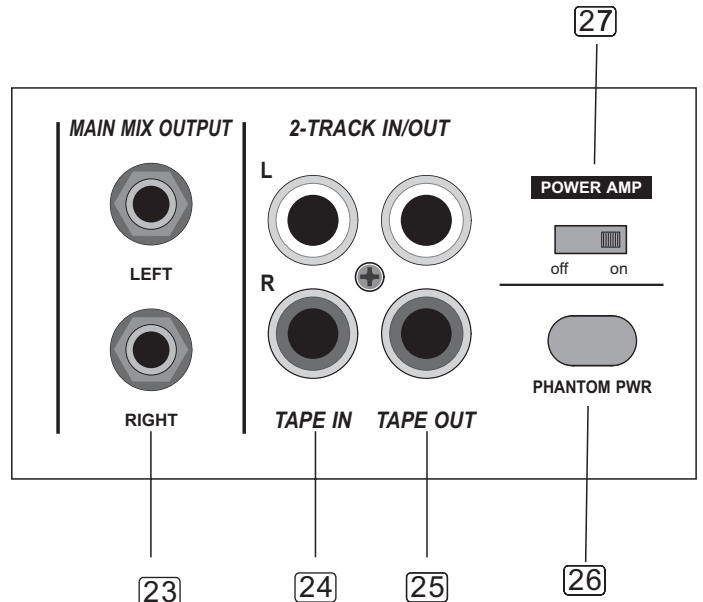
These RCA jacks will route the main mix signal into a tape recorder.

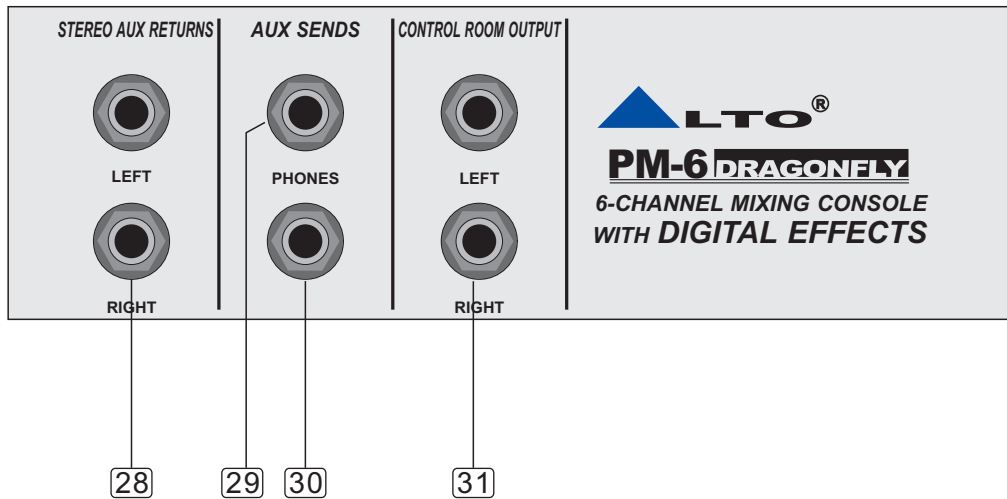
- PHANTOM PWR 26

This switch is used to apply +18 Volt Phantom Power only to the 2 XLR inputs sockets. When these sockets are connected with devices that do not require Phantom Power, Please make sure the Phantom Power is turned off, otherwise, this may damage the device and mixer.

- POWER AMP 27

This control is used to turn ON or OFF the built-in power amplifier.





- STEREO AUX RETURNS 28

Use these stereo 1/4" phone sockets to return the sound of an effect unit to the Main Mix. Alternatively you can use them as an extra auxiliary input.

- AUX SENDS 29

This 1/4" phone socket is used to send out the signal from the AUX bus to external devices such as effects and sound processors.

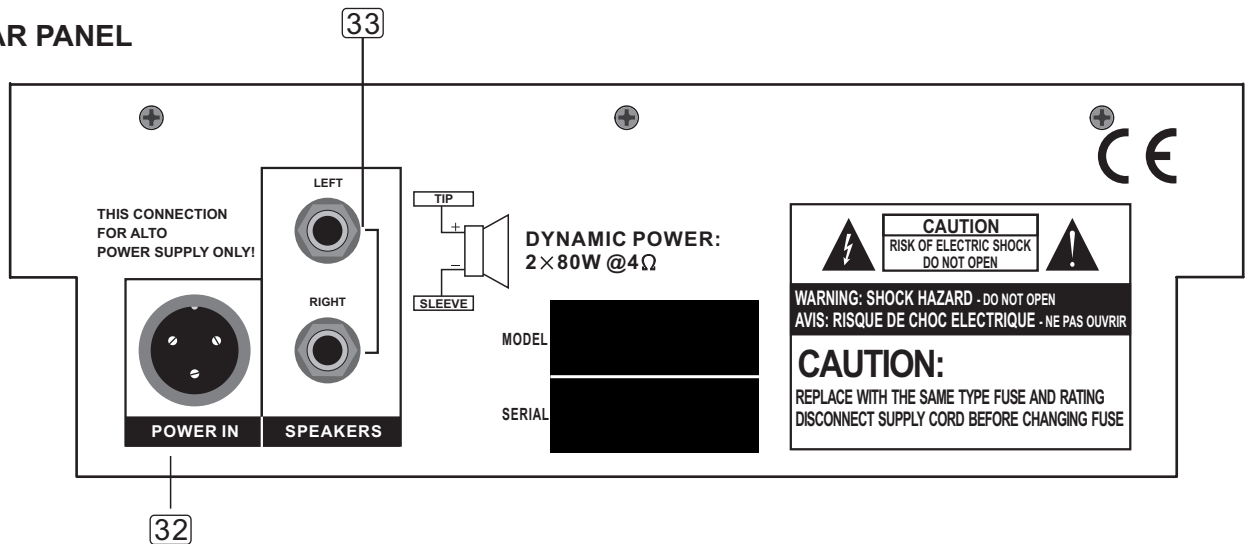
- PHONES 30

This socket will be used to send the signal to a headphone.

- CONTROL ROOM OUTPUT 31

These 1/4" phone sockets will be used to send the signal to Studio Monitor speakers or to a second set of PA.

4.10 REAR PANEL



- POWER IN 32

Used to connect the power supply box.

- SPEAKER OUTPUT 33

These 1/4" phone sockets are used to connect passive speakers directly, only these output signals through SPEAKER OUTPUT sockets are amplified by built-in power amplifier.

4.11 The Power Supply Box



- POWER CORD (34)

You can connect the plug of POWER CORD to the mains. Please check the voltage accepted by the unit and the voltage available from your AC sockets before connecting the unit to the mains.

- DC OUTPUT (35)

You can connect the cable from DC OUTPUT to POWER IN on rear panel. Thus, the power supply box will provide $\pm 24V$ DC voltage to your mixing console.

- POWER Switch (36)

This switch turns the Mixing console ON and OFF. When you turn on the Mixing console, both the power indicator in the box and the power indicator (18) on the panel will light on.

- FAN (37)

The fan can accelerate the flow of air to lower the temperature inside power supply. The inside temperature determines the fan speed which controls the inside air flowing speed.

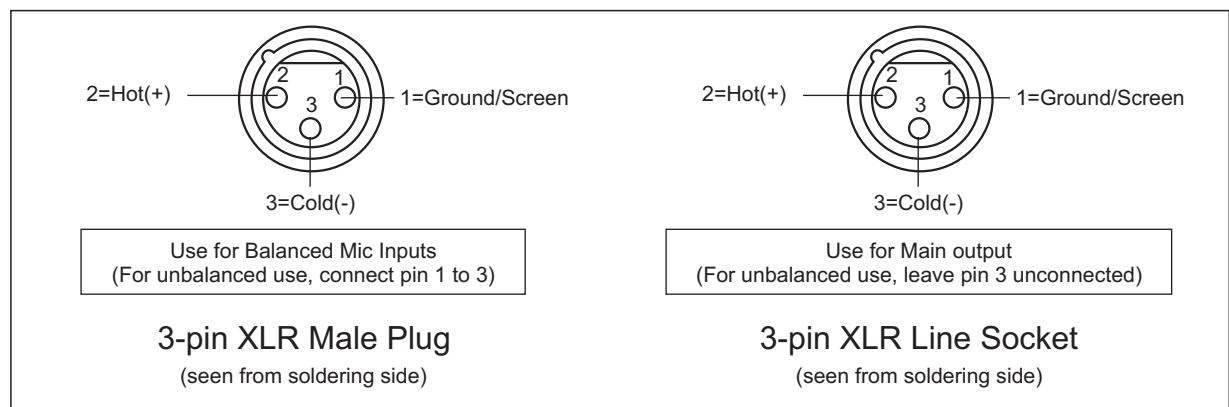
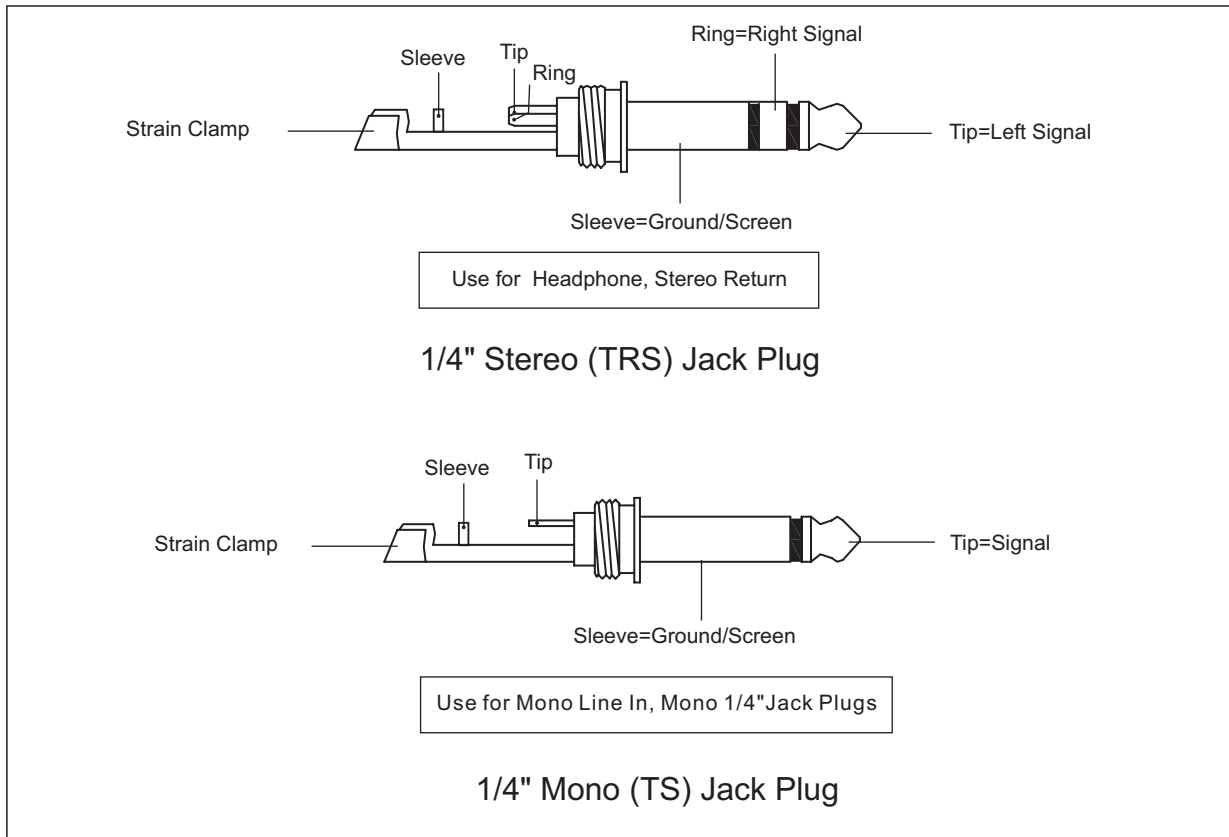
5. INSTALLATION AND CONNECTION

Ok, you have got to this point and you are now in the position to successfully operate your PM-6 DRAGONFLY. However, we advise you to read carefully the following section to be the real master of your own Mixer. Not paying enough attention to the input signal level, to the routing of the signal and the assignment of the signal will result in unwanted distortion, a corrupted signal or no sound at all. So you should follow these procedures for every single channel:

- 1). Before connecting mics or instruments, make sure that the power of all your systems components including the mixer is turned off. Also, make sure that all input and output controls are turned down. This will avoid damage to your speakers and excessive noise.
- 2). Properly connect all external equipments such as microphone, power amplifier, speakers etc.
- 3). Now, turn on the power of any peripheral devices, then connect the $\pm 24V$ DC power supply box to the mixer and main power.
Note: the power amplifier or powered monitors shall be turned on after the mixer and turned off before the mixer.
- 4). Set the output level of your mixer or the connected power amplifier at no more than 75%.
- 5). Set the CONTROL ROOM/PHONE level at no more than 50%.
- 6). Position HI, MID and LOW EQ controls on middle position.
- 7). Position panoramic (PAN/BAL) control on center position.
- 8). While speaking into the mic(or playing the instrument), adjust the channel Level control so that the PEAK LED will blink occasionally, in this way you will maintain good headroom and ideal dynamic range.
- 9). You can shape the tone of each channel by adjusting the equalizer controls as desired.
- 10). Now repeat the same sequence for all input channels. The Main LED Meter could move up into the red section. in this case you can adjust the overall output level through the MAIN MIX control.

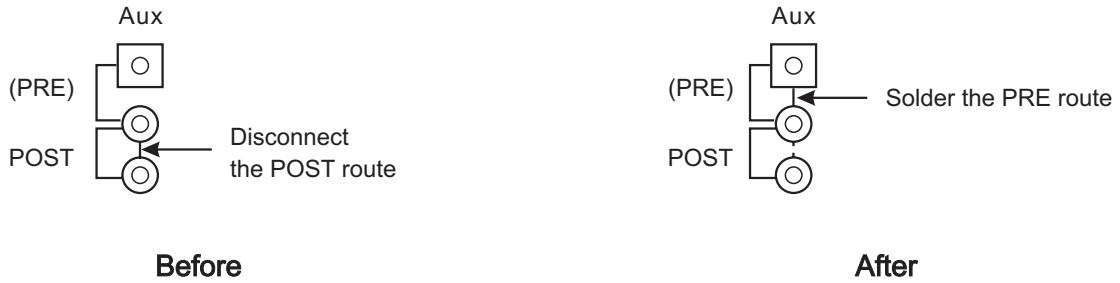
5.1. Some Final Tips on Wiring Configuration

You can connect unbalanced equipment to balanced inputs and outputs. Simply follow these schematics.



6. FOR THE EXPERTS WHO WANTS TO KNOW MORE

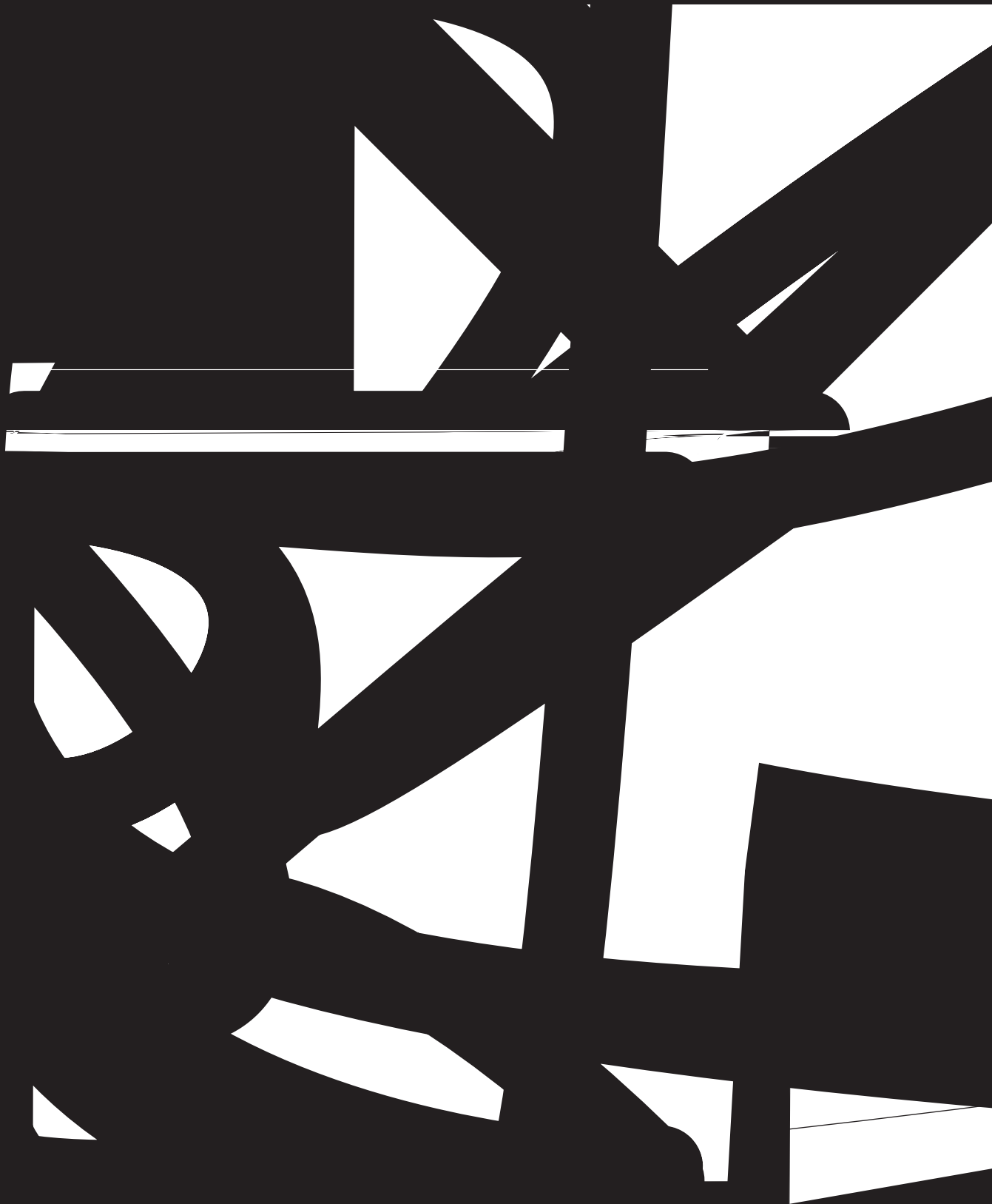
As we have told you previously in this manual, the Aux Send Control both on mono and stereo channels is factory wired as POST-FADER. If you are skilled in electronic components soldering you can modify this setting and have all your AUX sends configured as PRE-FADER.



Modification on mono and stereo channels

7. PRESET LIST

No.	Preset	Description	parameter
1	VibraFlange	Slight pitch variation with Flanger effect.	Mod Level : 90%
2	Funky	Large pitch variation with heavy Flanger effect.	Mod Level : 68%
3	Rockabilly	Simulate a stage space with slight Flanger effect	Rate : 0.1 Hz
4	Big stage	Simulate a stage space of the sound.	Decay time : 5.4s
5	Vibrato 4	Slight variation of pitch resulting from the free oscillation of the vocal cords.	Rate : 4.8 Hz
6	Vibrato 3	Slight variation of pitch resulting from the free oscillation of the vocal cords.	Rate : 3.8 Hz
7	Vibrato 2	Slight variation of pitch resulting from the free oscillation of the vocal cords.	Rate : 3.0 Hz
8	Vibrato 1	Slight variation of pitch resulting from the free oscillation of the vocal cords.	Rate : 2.0 Hz
9	Flanger 4	Simulate to play with another person carrying out same the notes on the same instrument	Rate : 4.9 Hz
10	Flanger 3	Simulate to play with another person carrying out same the notes on the same instrument	Rate : 3.21 Hz
11	Flanger 2	Simulate to play with another person carrying out same the notes on the same instrument	Rate : 0.9 Hz
12	Flanger 1	Simulate to play with another person carrying out same the notes on the same instrument	Rate : 0.56 Hz
13	CHORUS 4	Recreate the illusion of more than one instrument from a single instrument sound	Rate : 3.6 Hz
14	CHORUS 3	Recreate the illusion of more than one instrument from a single instrument sound	Rate : 1.79 Hz
15	CHORUS 2	Recreate the illusion of more than one instrument from a single instrument sound	Rate : 0.82 Hz
16	CHORUS 1	Recreate the illusion of more than one instrument from a single instrument sound	Rate : 0.39 Hz



9. TECHNICAL SPECIFICATION

Mono input channels	Microphone input	electronically balanced, discrete input configuration
	Frequency response	10Hz to 55kHz, +/- 3dB
	Distortion (THD & N)	0.005% at +4dBu, 1kHz
	Gain range	0dB to 44dB (MIC)
	SNR (Signal to Noise Ratio)	>100dB
	Line input	electronically balanced
	Frequency response	10Hz to 55kHz, +/- 3dB
	Distortion (THD & N)	0.005% at +4dBu, 1kHz
	Sensitivity range	+15dBu to +/- 30dBu
Stereo input channels	Line input	Balanced
	Frequency response	10Hz to 55kHz, +/- 3dB
	Distortion (THD & N)	0.005% at +4dBu, 1kHz
Impedances	Microphone input	1.4kOhm
	All other inputs	10kOhm or greater
	Tape out	1kOhm
	All other output	120Ohm
Equalization	Hi shelving	+/- 15dB @12kHz
	Mid bell	+/- 12dB @2.5kHz
	Low shelving	+/- 15dB @80Hz
DSP SECTION	A/D and D/A converters	24 bit
	DSP resolution	24 bit
	Type of effects	Vibraflange, Funky, Rockabilly, Bigstage, Vibrato 1-4 Flanger 1-4, Chorus 1-4
	Presets	16
	Controls	16-position PRESET Selector, FX level, REVERB level, CLIP LED
Main Mix Section	Noise (Bus noise)	Fader 0 dB, channels muted: - 100dBr (ref.:+4dBu)
		Fader 0dB, all input and set to UNITY gain: -90dBr (ref.: +dBu) channels assigned
	Max output	+22dBu unbalanced, 1/4" jacks
	AUX Returns gain range	-∞ to +15dB
	AUX Sends max out	+22dBu
Power AMP section	Power AMP output(Dynamic Power)	2 × 80W@4Ohm
Power supply (AC/DC)	Main voltage	USA/Canada 100 - 120V ~, 60Hz
		Europe 210 - 230V ~, 50Hz
		U.K./Australia 240V ~, 50Hz
Physical	Max Power Consumption	130 watts
	Dimension (W×D×H)	185mm×247mm×72mm
	Net weight(with power supply)	2.95kg (6.50 lb)
	Shipping weight	3.49kg (7.70 lb)

10. 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.

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