User's Manual

RSA 27

Realtime Analyzer
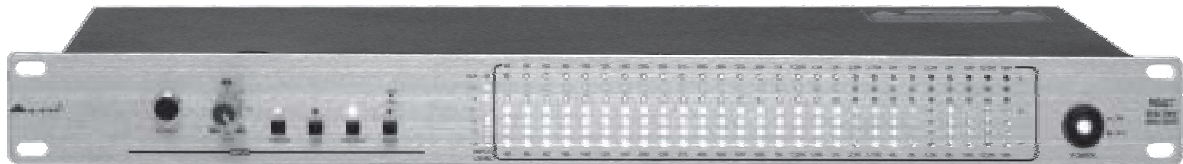
SAFETY RELATED SYMBOLS

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.

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 RSA 27 Realtime Analyzer and thanks for choosing one of the 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 let 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 would 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, and the best fruits of our continuous researches and the best prices.

The RSA 27 Realtime analyzer has several features: simple operation interface, realtime spectrum analyzing tool, pink noise generator and optimizing stage monitor sound quality etc.. You can reduce the feedback effectively depending on the RSA 27 display. For further details, please go through the user's manual carefully.

Nothing else to add, but that we would like to thank all the people that made the ▲LTO RSA 27 Realtime Analyzer a reality available to our customers, thank our designers and all ▲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

TABLE OF CONTENT

1. INTRODUCTION

Thank you very much for expressing you confidence in ▲LTO products by purchasing our ▲LTO RSA 27 Realtime Analyzer. With the RSA27 you have acquired the flexible and applied realtime spectrum analyzing tool and pink noise generator, which can optimize stage monitor sound quality and reduce feedback problems.

The RSA 27 offers the simple and clear operation interface and excellent performance. It contains the four pushing-buttons, each of them is equipped with the LED indicator; 28 bar LEDs display, through which, the RSA can react readily on program materials, then you can find the specific feedback points easily; a input gain control and a MIC input socket.

In order to get the best out of your RSA 27 Realtime Analyzer, please go through this manual carefully.

2. FEATURE LIST

- Signal rack unit
- Illuminated power switch
- 27 band in 1/3 octave ISO centers display within a range of 40Hz to 16kHz
- ±3dB/±6dB range for switch
- Pink noise generator
- Switch-able +48V phantom power supply
- 1/4" TRS microphone input
- Balanced XLR AUX MIC input
- 1/4" TRS and XLR connectors for output
- Pink noise 1/4" TRS unbalance output
- High quality parts and rigid configuration for long life and full credibility
- Manufactured under QS9000, VDA6.1 certified management system

3. CONTROL ELEMENTS

3.1 The Front Panel
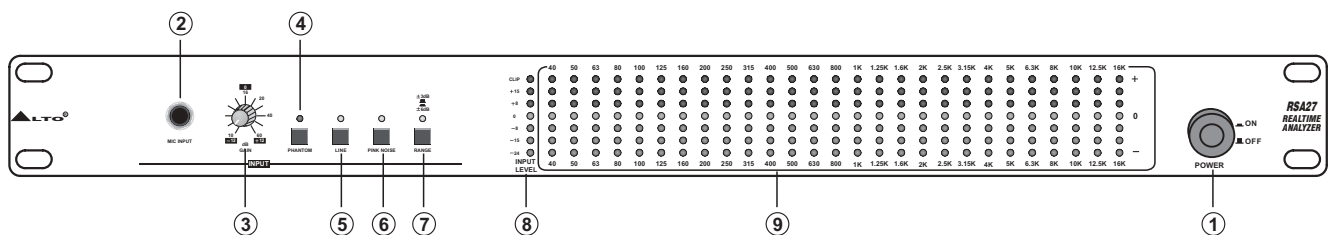
1. POWER Switch

Turn the apparatus ON or OFF.

2. MIC INPUT Connector

The MIC input is used to feed the external program source to signal path. Depend on the LINE switch, you can select to input MIC signal or LINE signal through the connector. For further details, please refer to the (5). Besides, the MIC input connector is in parallel with the AUX MIC input connector on rear panel, but is used to input prior to AUX MIC input.

3. INPUT GAIN Control

Rotating this control will give you proper gain. The control is provided with two different indication rings, when releasing the LINE switch (5), you should read the inside ring (10dB ~ 60dB) indication; otherwise, pressing the switch allows you read the outside ring (-12dB ~ +12dB) indication.

4. PHANTOM Switch

Engaging this button will provide the standard +48V DC power for most condenser microphones, and the corresponding LED will light up.

Note: Plug in the microphone well before turning phantom power on.

5. LINE Switch

Through this switch, you can select to input MIC signal or LINE signal. Engaging is for LINE signal, and the corresponding LED will light up; otherwise, for MIC signal, and the LED is off.

6. PINK NOISE Switch

Engaging this switch is used to activate the pink noise generator, which will provide the pink noise.

Note: For avoiding the unexpected noise appear, please turn off your system before engaging this switch.

7. RANGE Switch

This button is used to switch range mode between ±3dB and ±6dB. Up for ±3dB; down for ±6dB. It can determine the 3dB or 6dB per LED scales on each band, and affect the display of frequency spectrum LED meters.

8. INPUT LEVEL LEDs Meter

This 7-digit meter tells you the level of input signal, and the range goes from -24dB to +15dB. In case of the Clip LED lights up, please turn down the input gain control to avoid any distortion.

9. Frequency Spectrum LEDs Meter

Through the 27-band LEDs meter, you can grasp the frequency realtime change easily. There are three sorts of LED displays, when the response is too high in corresponding frequency band, the red LED lights up; when the response within the setting range, the green LEDs light up; in the same way, when the response is too low, the yellow LEDs light up.

3.2 The Rear Panel
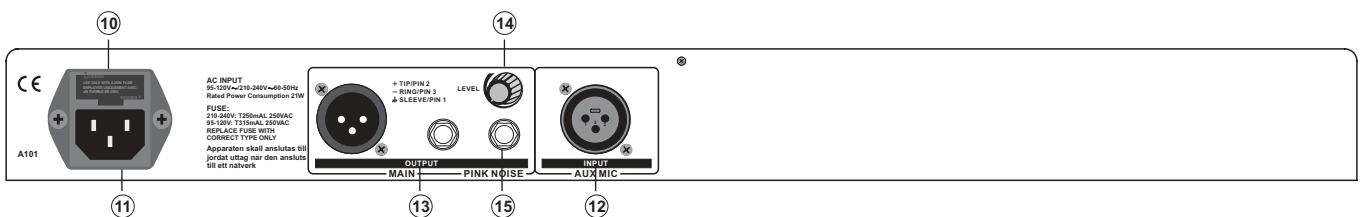
10. Fuse Holder / Voltage Selector

This is a dual voltage unit. Before you attempt to connect and operate the unit, please make sure that your local voltage matches the voltage on the fuse holder cover.

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.
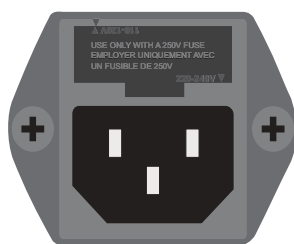
THIS IS SET FOR
110V AC TO 120V
AC OPERATION
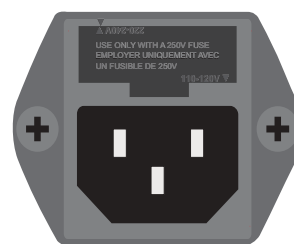
THIS IS SET FOR
220V AC TO 240V
AC OPERATION

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.

To change, pull fuse holder out and rotate 180^0, then push in again.

11.AC Inlet

This connector is meant for the connection of the supplied main cord. Do not insert power cord into unit until voltage has been correctly set. Do not plug power cord into AC power until voltage has been correctly set.

12.AUX MIC INPUT

The XLR connector is parallel with MIC INPUT, which is used to input the signal from a low impedance microphone.

13.MAIN OUTPUT

These connectors are used to output the signal. You can output the signal via the balanced XLR connector or 1/4" TRS phone jack.

14.LEVEL Control

This control is used to boost the level for signal from pink noise generator.

15.PINK NOISE

The 1/4" TRS connector is used to output pink noise to external sound system.


4. INSTALLATION & CONNECTION

4.1 Audio Connection

Both XLR and 1/4" TRS connectors are available on your RSA 27. In this way you can interface your RSA 27 in several different ways without experiencing any noise or signal loss. You can use your RSA 27 with single instrument using the mixer's main insert or on the complete mix connecting the RSA 27 in between the mixer and the power amplifier.
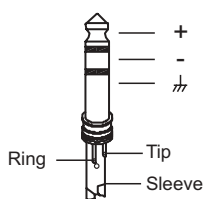
- Wiring Configuration

Either the 1/4" TRS phone jack or the XLR connector can be wired in balanced and unbalanced modes, which will be determined by the actual application status, please wire your system as the following wiring examples:
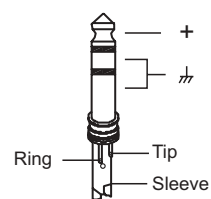
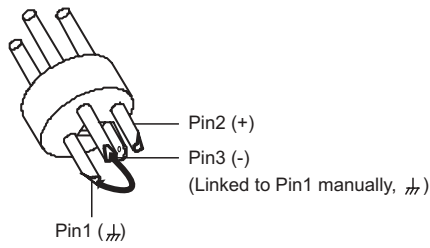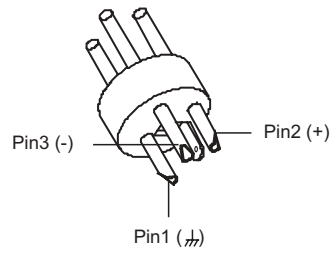• For 1/4" Phone jack
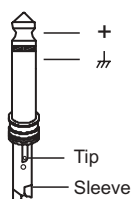
| TS Type Unbalanced	TRS Type Balanced	TRS Type Unbalanced

• For XLR connector

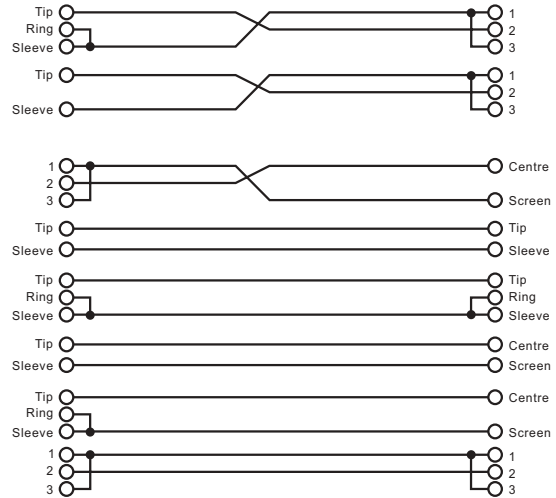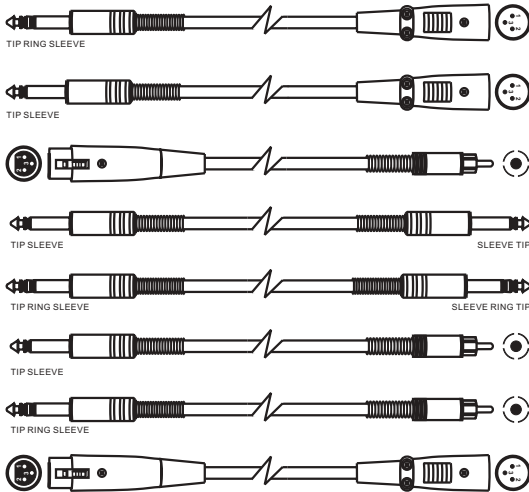

XLR Type Unbalanced

XLR Type Balanced

- In Line Connection

For these applications the RSA 27 Realtime Analyzer provides 1/4" TRS connectors and XLR connectors to easily interface with most any professional audio device. Follow the configuration examples below for your particular connection.

• Balanced
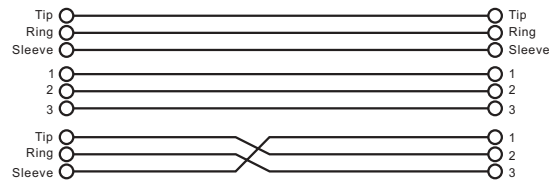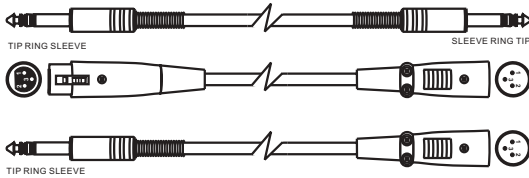
• Unbalanced

4.2 Rack Mounting

The most secure mounting is on a universal rack shelf available from various rack manufactures or your music dealer. The RSA 27 Realtime Analyzer fit 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 RSA 27 Realtime Analyzer on high temperature devices such as power amplifier etc. to avoid overheating

5. APPLICATION

In this chapter, we will explain how to use and wire your RSA 27 Realtime Analyzer. In live application, the RSA 27 can be as a frequency realtime spectrum analyzer or as a pink noise generator. For further details, please read following content carefully.

First, let's catch on the pink noise, which is defined as random noise that has been weighted with frequency to produce constant noise power per octave, while one octave is added, the noise power is attenuated by 3dB. Because the ear of human being reflects the logarithm effect to the sound, so the pink noise is heard as the same level for each octave. Just because of this character, the pink noise is always used in the sound reinforcement system to adjust the equalizer.

Next, let's introduce how to use the RSA27 in system.

Usually, it is difficult to grasp the change of frequency spectrum in stage monitor. In order to detect the response problems in time, ▲LTO RSA 27 provides easy and useful operation interface, which contains 27 bands LEDs display that are used to read the program materials real time.

The RSA 27 is used to visually judge the character of pink noise signal received by the measurement facilities, you may adjust the EQ to optimize the response of a sound system based on RSA 27 LEDs display. If there are feedback occurs on some frequency band in system via observing the LEDs display, you can kill it through adjusting the level in system in time.

Generally speaking, the frequency response of system is very flat, so you will look the LEDs display of RSA 27 like at the same level. If some frequency band is out of the level, through the RSA 27 display you can adjust the EQ to get the best result.

In any case, the RSA 27 Realtime Analyzer is very useful tool.

Here, we introduce the connection of RSA 27 in a system simply, perhaps, it will help you a lot.
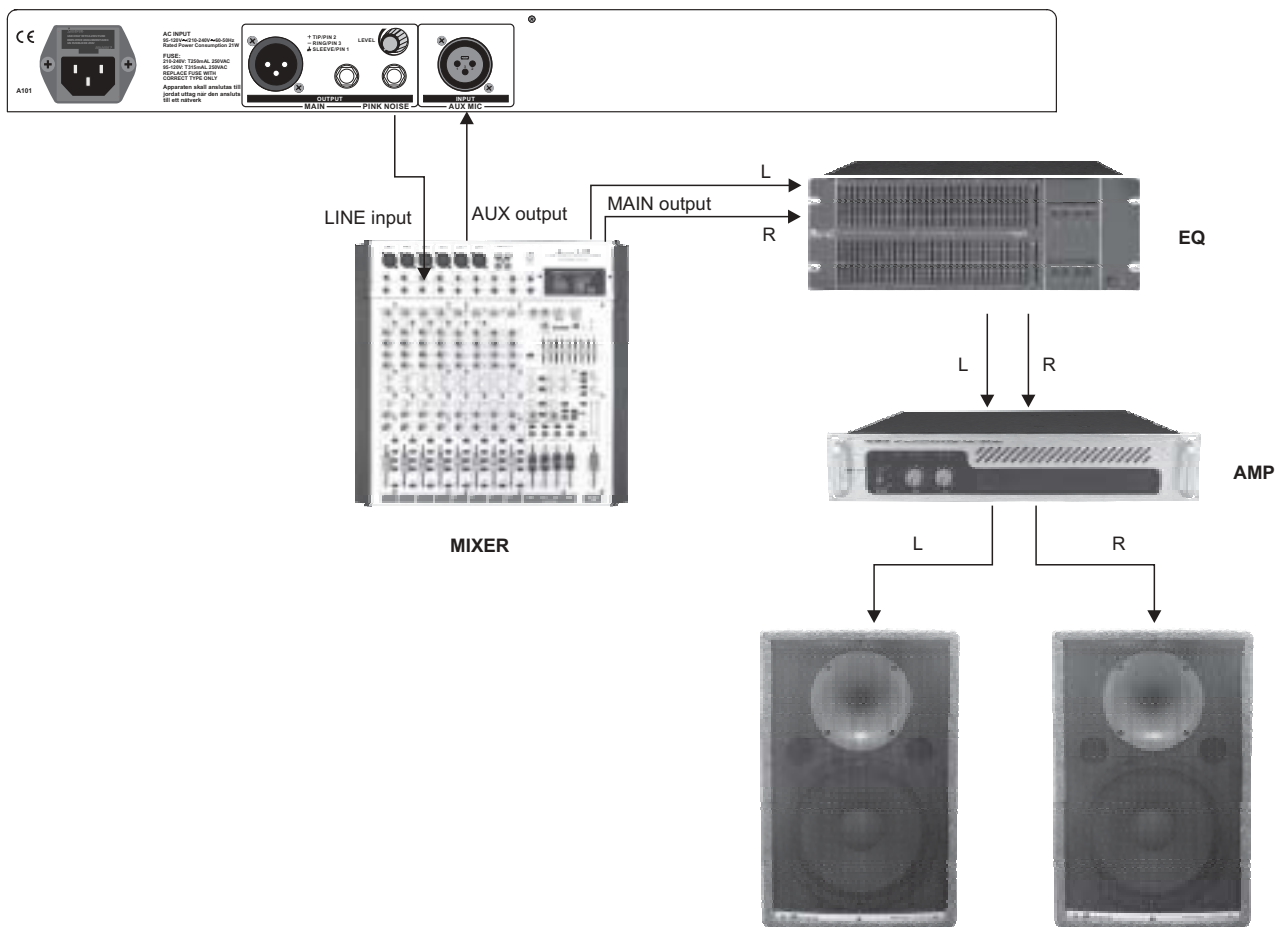
6. TECHNICAL SPECIFICATIONS

INPUT section		
	Connectors	1/4" TRS jack and XLR connector
	Input Gain	MIC: 10 ~ 60dB
		Line: -12dB ~ +12dB
	Input Level	MIC in: +14.8dBu
		Line in: +23dBu
OUTPUT section		
	Connectors	1/4" TRS jack and XLR connector
	Output Level	Main out bal +22dBu
Real Time Analyzer		
	27 bands (40Hz ~ 16kHz)	7-digit LED for each band
	Filters	1/3 octave
	Range	±3dB / ±6dB
General Performance		
	Phantom	Supply +48V
	Pink noise	OFF to 0dBu
	Frequency Response	10Hz to 50kHz: 0/-2dB
	Distortion	MIC: <0.01% /-30dBu /30dB gain
		Line: <0.009% /0dBu
	S/N ratio	83dBu
Power supply		
	Mains Voltage	U.S./CANADA 100 - 120V~, 60Hz
		U.K./AUSTRALIA 210 - 240V~, 50Hz
		EUROPE 240V~, 50Hz
	Power Consumption	21W
	Fuse	100 - 120V~: 315mA
Physical		200 - 240V~: 250mA
	Dimension	483(W)×217(D)×44(H)mm
	Net weight	2.07kg
	Gross weight	2.57kg

7. BLOCK DIAGRAM
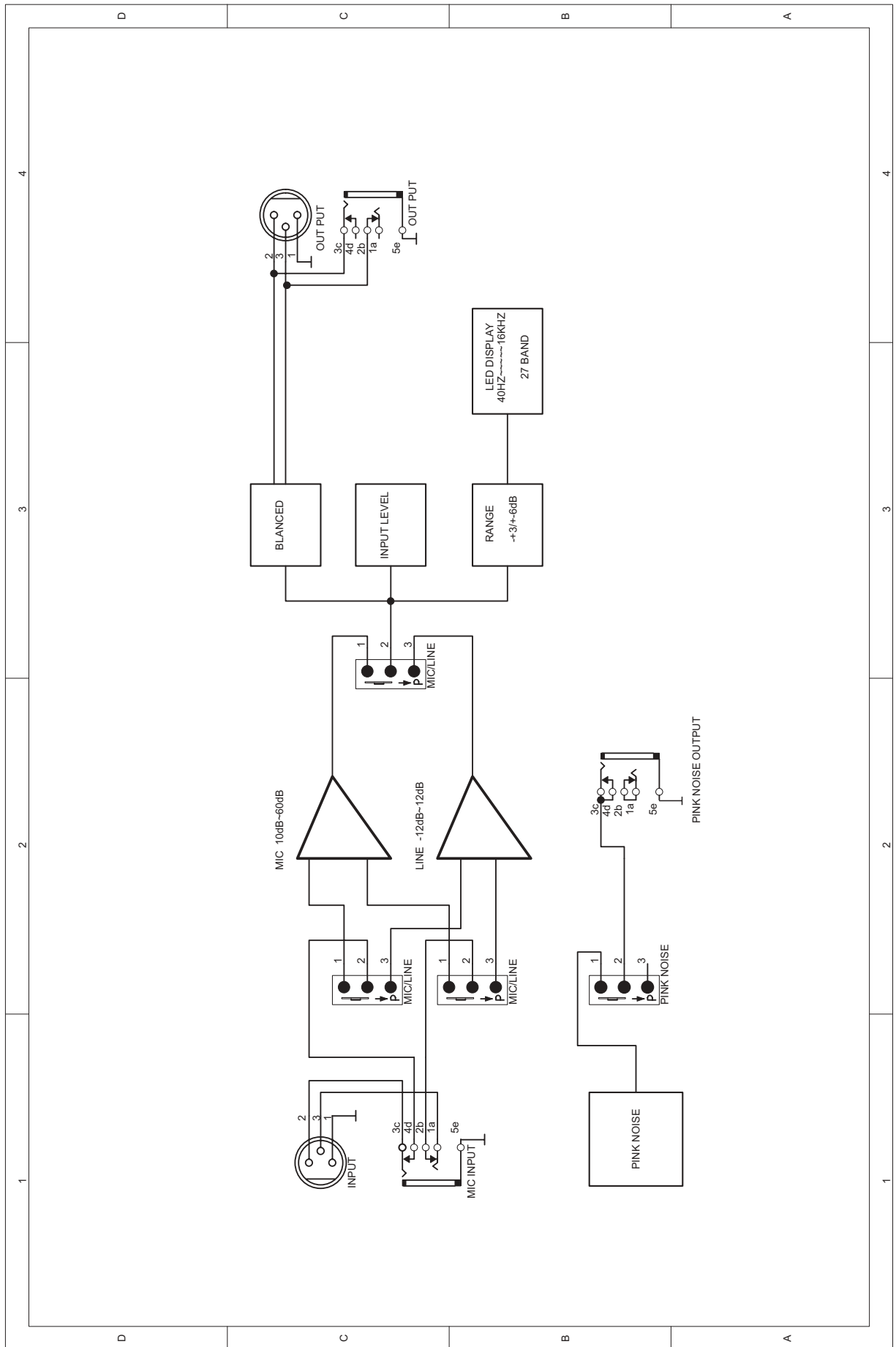
8. WARRANTY

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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