COMPACT MIXER

MM1002 / MM1202

USER'S MANUAL

PHONIC

www.phonic.com

SAFETY PRECAUTIONS!

WARNING - TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE.

Do not allow water or liquids to be spilled into this unit. If the unit has been exposed to rain or liquids, please unplug the power cord immediately from the outlet (with DRY HANDS) and get a qualified service technician to check it. Keep this unit away from heat sources such as radiators, heat registers, stoves, etc.

This unit contains no user-serviceable parts. Refer all service needs to a qualified service engineer through a Phonic dealer.

This triangle on your component alerts you to the presence of uninsulated " dangerous voltage" inside the enclosure that may be sufficient to constitute a risk of shock.

This triangle on your component alerts you to important operating and maintenance instructions in this accompanying literature.

CAUTION:
TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVERS (OR BACK). NO USER-SERVICEABLE PARTS ARE INSIDE. REFER ALL SERVICING TO A QUALIFIED SERVICE PERSONNEL.

Keep this unit clean by using a soft dry brush and occasionally wiping it with a damp cloth. Do not use any other solvents, which may damage the paint or plastic parts. Regular care and inspection will be rewarded by a long life and maximum reliability.

Your Phonic MM1002 / MM1202 was carefully packed at the manufacturing site and the packing box was designed to protect the unit from rough handling. We recommend that you carefully examine the packaging and its contents for any signs of physical damage, which may have occurred during transportation.

If the unit is damaged: ***Notify your dealer and the shipping company immediately.*** Claims for damage or replacement may not be granted if not reported properly or in a timely manner.

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CONTENTS

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INTRODUCTION

Congratulations on your purchase of the MM serial Mixer. The MM serial mixer is built into a rugged construction, which is ideal for small live gigs, recording and fixed PA installations. In order to get the best performance from the mixer, please read this user's manual carefully. Please familiarize yourself with the new and different functions on this mixer.

FEATURES

MM1002

- 10 standard inputs
- 2 balanced Mic/Line input channels with 2 band EQ. Able to accept a wide range of Microphone and Line level from Neutrik combo connector
- 4 stereo inputs with +4/-10 input sensitivity selector
- Additional 2T return inputs, for CD playback or link to submixer
- Global +48V phantom power switch on 1-2 channel at master section
- Separate Mix and Control Room output
- M/S switch
- Record output
- Meter indicator switch allows meter to show MS/ST/Headphone level
- Headphone output
- Peak indicators on each mono input channel

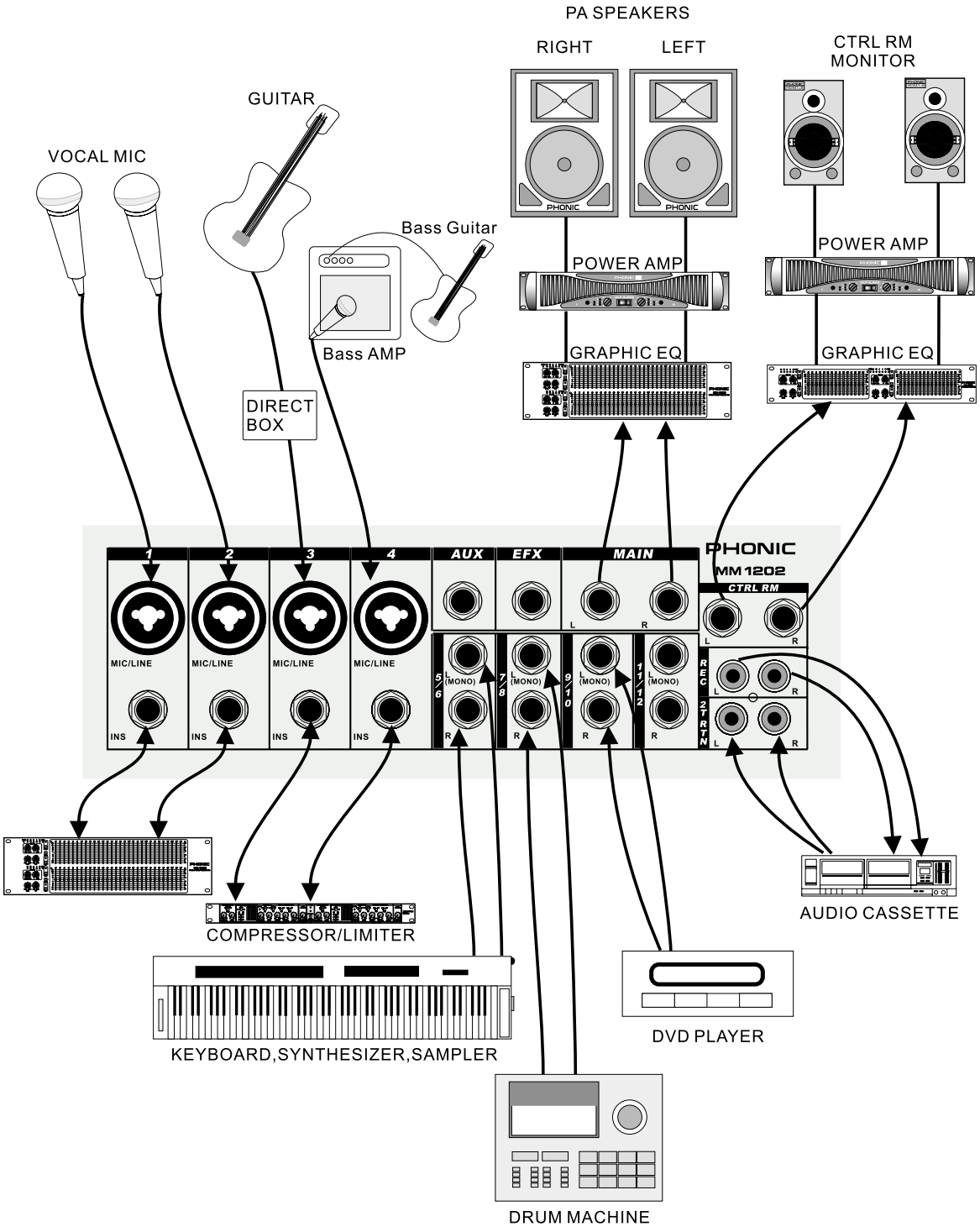
MM1202

- 12 standard inputs
- 4-balanced Mic/Line input channels with 3 band EQ. Able to accept a wide range of Microphone and Line level from Neutrik combo connector
- 4 stereo inputs with +4/-10 input sensitivity selector.
- Additional 2T return inputs, for CD playback or link to another submixer
- Global +48V phantom power switch on 1-4 channel at master section
- Separate Mix and Control Room output
- M/S switch
- Record output
- Meter indicator switch allows meter to show MS/ST/Headphone level
- Headphone output
- Peak indicators on each mono input channel

GETTING STARTED

1. Check the AC voltage before connecting the AC plug. This product is equipped with a 3-wire grounding type plug; this is a safety feature and should not be defeated. Proper grounding is a necessary practice to prevent electric shock hazards to the operator, the microphone user, and the musicians who are wired to this unit.
2. Before switching on the main power, keep all the output fader all the way down to prevent damage or excessive noise caused by bad level adjustment, wrong wiring, defective cables, or bad connection.
3. Always turn on the mixer before the power amplifier; turn off the mixer after the amplifier.
4. Always turn off the unit before connecting and disconnecting the unit from the power source.
5. Never use solvents to clean the unit. Clean with a soft, dry cloth.

CONNECTING IT UP



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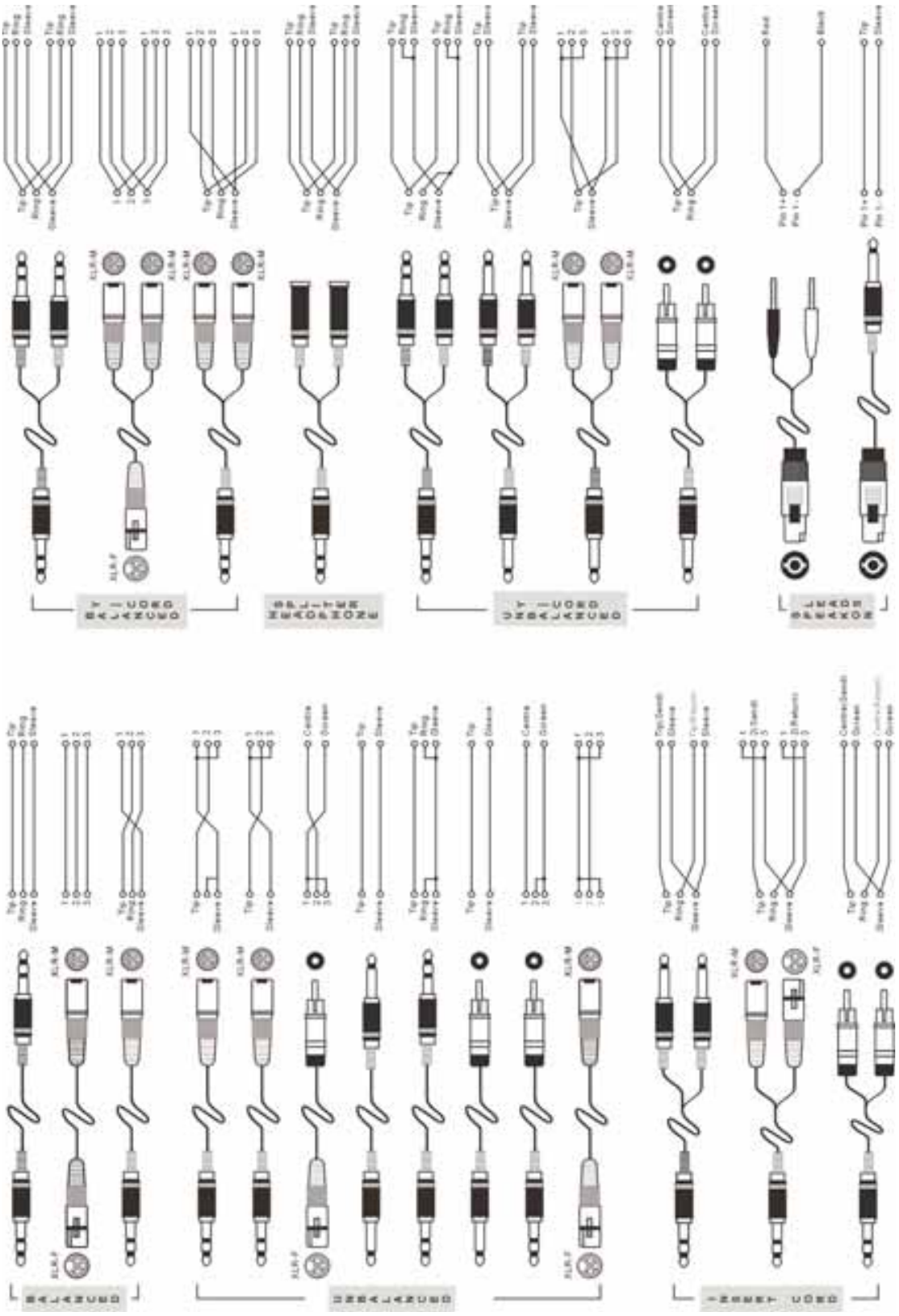
TYPICAL CONNECTING LEADS



UNBALANCED & BALANCED

Most of the mistakes in audio installations are due to incorrect and defective audio connections. In order to perfectly complete your installation. Please pay special attention to the following section unless you are already familiar with balanced/unbalanced operations.

WHAT IS AN UNBALANCED LINE?

You can find this kind of system in most of home audio-video systems. They have one conductor to carry signal, and another conductor for a ground. Normally, for lower level signals, the ground conductor shields the signal conductor.

WHAT IS A BALANCED LINE?

A balanced system transmits signal via 2 conductors plus one ground shielding conductor. The 2 signal conductors carry the same signal but out of phase. For the balanced input stage, the amplifier will boost the difference between the 2 signal conductors and remove the identical part (known as common mode signal) of the 2 signals . Because the real signal is carried by the 2 conductors out of phase, so it is perfectly carried to the input. At the same time, interference that occurs during transmission will be identical (common mode). Because the signal conductors are run together, there is no chance they can be different, and all the interference will be removed by the balanced input amplifier.

THE DIFFERENCE BETWEEN TWO OPERATIONS:

Because of the common mode interference immunity of a balanced system, the ground conductor doesn't need to carry any electrical current, which means the ground of the 2 connected units has an identical ground level which is vital to an interference free system. Let's look back at the unbalanced system. The signal electrical current goes from the signal conductor to the ground conductor. The ground level of the 2 connected units are not identical. This means the system is more easily inclined to noise interference.

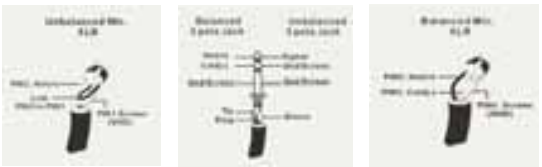
Running long cables is easy for a balanced system but difficult for an unbalanced system. A Lower noise level is a characteristic of a balanced system. Because a balanced system needs 2 conductors for the signal and 1 conductor for the ground, a minimum of 3 conductors are needed for wiring a balanced system. So a dedicated system separates the ground and shields the 2 conductors.

Please read following section to properly wire for balanced and unbalanced systems:

THE CORRECT WIRING FOR BALANCED OPERATION:

Always connect the main power with 3 plugs. Make sure the power system ground is working properly. Don't use a ground insulator plug adapter without properly connecting the ground individually. This is vital to making a successful audio system connection. Always connect the ground pin (PIN 1 in XLR) to the source unit, and disconnect this pin on the destination unit. This connection topology is to avoid creating a grounding loop between the signal and power ground. Utilize only the power ground, because it always has a lower resistance and better distribution than the signal ground.

If there is hum, a possible reason is a bad ground connection for the system. In case you can not find the fault, try connecting the ground pin of the input connectors. If the hum is reduced or eliminated, check your power grounding system. Special attention is needed when you use the equipment racks with some distance between them, and/or use a large quantity of power amplifiers. Check the power ground between the racks and power distribution strips with your electrical supply engineer. Make sure there is one, and only one, proper ground point for the audio system (or connected video system).



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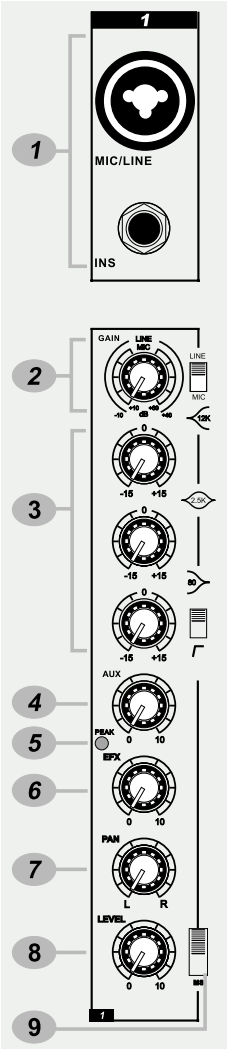


CHANNEL STRIP DESCRIPRION

1 MIC/LINE MM1002(Ch1~2)/ MM1202 (Ch1~4)

The Microphone is via a combo connector, which allows the connections of XLR or 1/4 " type phone jack. Please use only professional low impedance microphone and properly wired cable for best result. When the 1/4" phone jack plug into the combo connector, the connection can be microphone or line level signal, we can change the input trim for MIC or LINE by using the LINE/MIC slide-switch to set the different TRIM accordingly. However, the phantom power is only available for the XLR connection. Never turn on the phantom power when you have line level source connected to the XLR connector.

48V PHANTOM POWER

+48V Phantom Power is available on each microphone input channel. All faders should be all the way down when switching on/off the phantom power, in order to prevent excessive noise to stage monitor speakers and main speakers; Phantom powered mics should not be plugged in with the +48V switched on.

INS

The INSERT is a break point in the input channel signal path. It allows the signal to be taken out from the mixer, through an external equipment such as a compressor, and then back to the mixer to continue the final mix output.

2 GAIN

This rotary knob adjusts the channel signal level. Too high, the signal will distort as it overloads the channel. Too low, the level of back hiss will be more noticeable and there might be insufficient signal level to the output of the mixer. Proper gain setting allows the mixer to work in the best operating level, adjusts the gain when signal presents to the highest level without triggering the peak LED. That is the most appropriate position.

This gain has two kinds of indication to suit mic or line input, when you use mic input, please read inside ring from +10~+60 dB, if you use line input, please read outside ring from -10~+40dB.

LINE / MIC SWITCH

When you use the channel for microphone, either through XLR or Phone plug, please switch to MIC. If you use the channel for line level source, either through XLR or Phone plug, please switch to the LINE. This switch will set the appropriate gain range for the input signal.

3 EQUALIZER

HIGH

Turn right to boost high frequency, adding crispness to cymbals, vocals and electronic instruments. Turn left to cut this frequency, reducing sibilance or hiss. The control has a shelving response that gives 15dB of boost or cut at 12KHZ.

MID (MM1202 ONLY)

The knob provides 15dB of boost or cut at 2.5KHz, just like the HF EQ knob, the mid band covers the range of most vocals. Listen carefully when you use this control to find how particular characteristics of vocal or guitar signal can be enhanced or reduced .Set the upper knob in the “0” position when not required.

LOW

The control has shelving response that gives 15dB of boost or cut at 80Hz. Adding warmth to vocals or extra punch to guitars, drums and synths by turning to the right. Turn left to reduce stage rumble, hum or to improve a mushy sound.

These equalizers are designed to accomodate different room acoustics, feedback control and improve live PA sound. But no amount of equalization will correct the frequency response curve of a poor loudspeaker. Always begin with all control at the “0” position and avoid excessively cutting/boosting large segments of the peculiar frequency, which would limit the system dynamic range or increase the possibility of the unpleasant feedback sound.To make sound more impressive, dynamic process is necessary. Channel inserts are designed to add-on a compressor, limiter or gate. Please refer to Phonic PCL3200 or MCL2000 for further information.

LOW CUT

Slide down the slide-switch; insert the 18dB per octave 75Hz low cut filter in the signal path. This low cut filter is useful on live vocals to reduce stage rumble or ‘popping’ from microphones. It can also be used to cut off low frequency hum.

4 AUX

This rotary fader sends out the channel signal to AUX bus. The signal is pre-fader so that the aux send to be independent of the fader; this is suitable for foldback or monitor.

5 EFX (MM1202 ONLY)

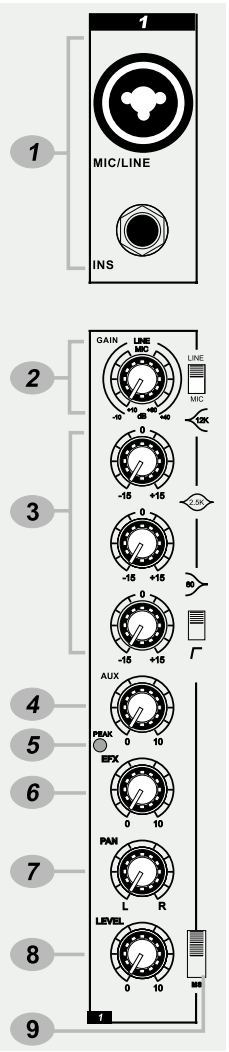
This rotary fader feeds the channel signal to the external effect. The signal is post fader. This is very helpful in simultaneously adjusting the level of the processed signal.

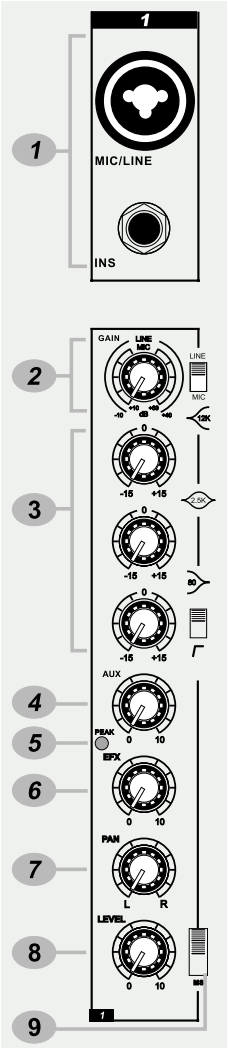
6 PEAK

This red LED will warn you when an excessively high signal level is present in the channel. The signal is sampled at two points in the channel, immediately after/ before the HPF and equalizer. The peak LED will illuminate approximately 6dB before clipping and therefore give warning of a possible overload.

7 PAN

This control sets the amount of the channel signal feeding the left and right mix bus, allows you to locate the source smoothly across the stereo image.





8 LEVEL

A rotary fader determines the proportion of the channel in the mix and provides a clear visual indication of channel level.

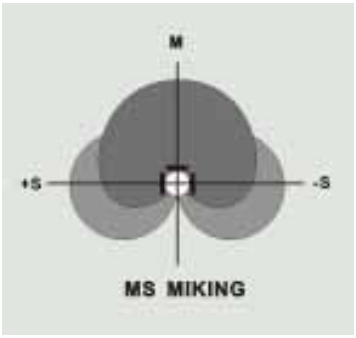
9 M-S SWITCH

To create your stereo sound image, simply slide the switcher to MS and you get a M-S stereo recording.

If you want to make a M-S stereo recording, usually, you will need 2 microphones, one is cardioid for M signal pointing at the center, and the other is figure-eight microphone for S signal pointing to the side. In order to decode the MS signal to XY, you need 3 channels of Mic input to start with, one for M and the other two for +S and -S accordingly. MM series' unique feature - the MS switch - will help simplify the whole process. Now you will not have to worry about the channel availability, and patching with a special cable. When you have an occasion to make a stereo recording, please just choose the MM series mixer and simply slide the M-S switch down. The mixer will prepare everything itself. The odd channel will now become the M channel. The even channel will become the S channel-just plug and play.

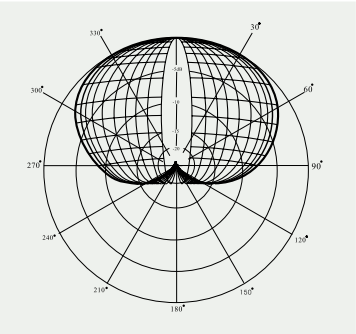
M-S STEREO RECORDING

M-S is an abbreviation for mid-side, the microphones used for M-S recording are a cardioid microphone facing directly to the source, and a figure-eight microphone facing sideways. The figure-eight microphone picks up the left half of the source with one phase and the right half with the inverted phase. When the signal is added to the signal from the cardioid, the signals from the left side are added together, while the signal from the right subtract due to the phase inversion. The combined pattern of the two microphones is similar to two cardioids (or figure eight) facing 45 degrees to the left and the other cardiod facing 45 degrees to the right to create the stereo image. Why don't we use two cardioids 90 degrees apart? That will do something entirely different! With the M-S system, the related angle of the cardioids can be varied according to the level of S (figure eight), and this will vary the width of the stereo image.



WHAT IS A CARDIOID MICROPHONE?

Cardioid means heart-shaped. Any microphone which has a hearted-shaped Polar Pattern is called a cardioid microphone. The cardioid is most sensitive to the sounds which arrive from the front. The sounds which arrive from 90 degrees to the side are 6 Decibels less sensitive than to the front, and theoretically, it is completely insensitive to the sounds coming from the rear. In practice, the 100% directional qualities of a cardioid are impossible to achieve due to reflected sounds from walls and ceiling, which are entering the sensitive area of the microphone.
The most important attribute of the cardioid is that the microphone can discriminate between direct sounds and reverberant sounds, which come from all other directions at random. One of the most important uses of the cardioid microphone is in sound reinforcement, where the directivitive allows the system gain to be higher without generating acoustic feedback.



CARDIOID POLAR PATTERN

WHAT IS A FIGURE-8 MICROPHONE?

The derivation of the name for this pattern is obvious from the following figure. Bi-directional elements are most sensitive to sounds coming in from the front or rear(left or right) of the microphone, and reject sounds from the sides(front and rear).

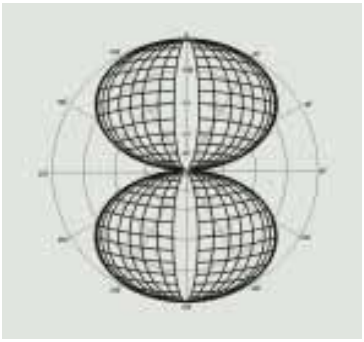
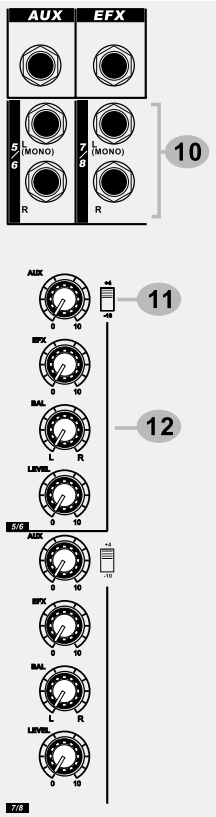


FIGURE-8 POLAR PATTERN



10 STEREO INPUT

These high impedance inputs accept 2-pole phone jacks. Use these inputs for keyboards, drum machines, synths, tape machine or processing units. If the source signal is mono please plugs into the left channel socket only.

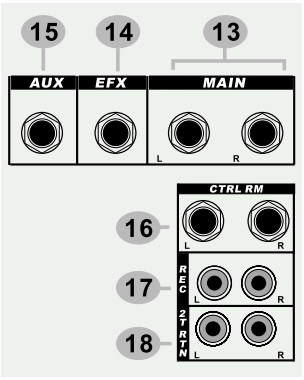
11 +4/-10 SWITCH

The stereo input channel accept 1/4“ phone jacks. It provides two input sensitivities .The –10dBV should be selected for amateur type machine or HIFI systems, most professional equipment uses input and output levels of +4dBu. This switch allows you to match the sources connected to the stereo input channel to either standard, which is important to ensure the best possible sound quality, start with the switch +4, if you can‘t achieve an enough signal level, select to –10dBV.

12 BAL (BALANCE) CONTROL

The BALANCE control sets the amount of the channel signal feeding the MAIN mix output, allows you to balance the source in the stereo image. When the control knob turns fully to the left or right, you send only that side of the signal to the mix.

MASTER SECTION DESCRIPTION



13 MAIN OUT

These sockets send line level signals from the mixer to external devices (for example: EQ or a power amplifier).

14 EFX OUT (MM1202 only)

This socket sends out the signals from mix bus.

15 AUX OUT

This socket sends out the signals from aux bus.

16 CTRL RM

This jack socket sends the mix signals to the control room speakers.

17 REC

The signals are sent to the tape recorder via the associate RCA sockets.

18 2T RTN

These 2 RCA jacks are for the 2T tape return to the mixer.

19 EFX OUT CONTROL(MM1202 ONLY)

This knob controls the mix signals level send to the external effect.

20 AUX OUT CONTROL(MM1202 ONLY)

This knob controls the AUX OUT level.

21 +48V PHANTOM PWR

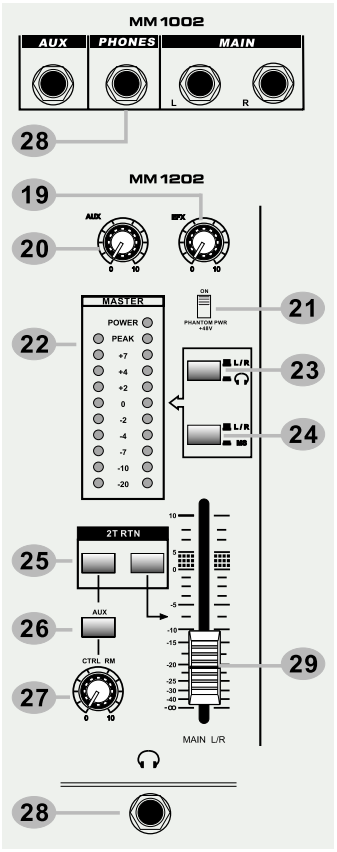
This slide-switch turns the master phantom power on and off.

22 LED LEVEL METERS

LED meter shows the level of master mix L and R in the stereo mode: In the MS mode, the left hand side meter shows the M signal level, the right hand side shows the S signal level.

23 HEADPHONE / STEREO INDICATION SELECT BUTTON

Push down to select the meter to show headphone level, release it to show the main stereo output level.

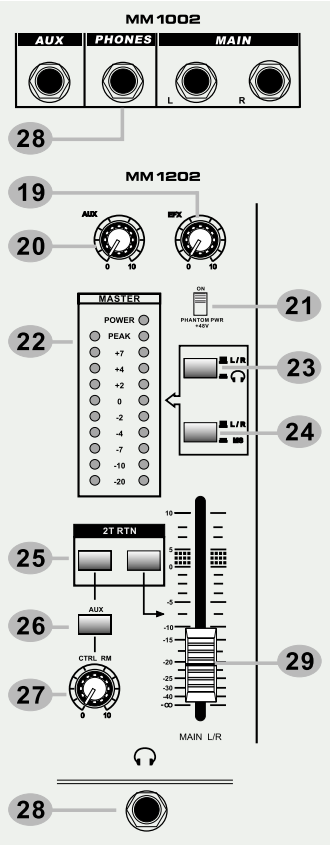


24 MS/ST SELECT BUTTON

The switch select the LED LEVEL METER are in the MS or STEREO mode, in the MS mode; the left channel of the LED LEVEL METER represents the M signal, the right channel of the LED LEVEL METER represents the S signal. Two LED level are always different. The closer the difference between two levels the wider the stereo image you can get. If only the M signal of the meter shows, the master output is MONO. If S level is higher than M, the stereo is out of phase.

25 2T RTN SIGNAL PATH SELECT BUTTON

Push down the right button feeds the 2T RTN signals into MAIN L/R output. Push down the left button feeds the 2T RTN signals into control room and effected by the control room level.



26 AUX SIGNAL PATH SELECT BUTTON

Push this button to feed the AUX signal to the control room affected by the control room level.

27 CTRL RM LEVEL

This rotary fader controls the output level to the control room and headphone.

28 HEADPHONE

This jack socket sends the mix signals to the headphone.

29 MAIN L/R FADER

This 60mm long fader controls the output level of MAIN OUT.

REAR PANEL DESCRIPTION

30 POWER SUPPLY INPUT SOCKET

Connect the power supply unit to this socket. Make sure the power supply unit is not plugged into AC outlet before connecting to the mixer.

31 POWER ON/OFF SWITCH

This switch turns the power of the unit on and off.

INITIAL SETUP

This procedure is very important. Even if you don't like to read manuals, please read this section. After you have connected the system, you can begin the initial set up for every input channel. The matching of every input gain to the signal source is crucial. Every detail affects the final output of the mixer. Basically, the input sensitivity adjustment, channel fader, and output fader are the main factors. You should try to set only as much microphone gain as required to achieve a good balance between signals. If the input gain is set too low, you will not get enough gain on the faders to push the signal up to an adequate level. If the input gain is set too high, the channel fader will need to be pulled down in compensation, but leave the greater risk of feedback because a small fader movements will have a very significant effect on output level. Certainly, the limited fader travel path will not be successful in the mixing procedure. Please use the following set up procedure. Don't turn the output up until they clip and then backing off.

FOLLOW THE PROCEDURE FOR EACH CHANNEL IN USE

- Set all faders and gain controls all the way off.
- Phantom powered microphone should be connected before the +48V is switched on.
- Set power amplifier levels to 70%.
- Set the CTRL RM Level and Headphone level to about 50%.
- If you want to hear what you're doing later, plug your headphone into the phone output socket, or hook up your control room amplifier system to the Control Room outputs.
- Set EQ control at center position.
- Set PAN and BALANCE knobs at center position.
- You need a headphone to continue.
- Apply a typical performance level signal, monitoring the level on the LED meter.
- Adjust the input gain until the meter shows in the amber section, with occasional peaks to the first red LED at maximum source level. This allows enough headroom to accommodate peaks and the maximum level for normal operation; you can listen to them through your headphone.
- For"+4" line level audio signals, slide the +4/-10 switch to +4.
- For "-10" sources, slide the +4/-10 switch to -10.
- For microphone sources, the gain control adjustment will depend on what kind of the microphone you use, normally turn the gain clockwise around 2~3 o'clock. But please ask the singer to perform outloud, don't whisper, if they do not sing at a normal level while you are doing the sound check, you might drive the mixer to overload or produce feedback, because you set the gain too high during the initial set up.
- Repeat this procedure on all other channels. When more channels are added to the mixer, the meters LED may move up to the red section. Adjust the overall level using the master faders if necessary.

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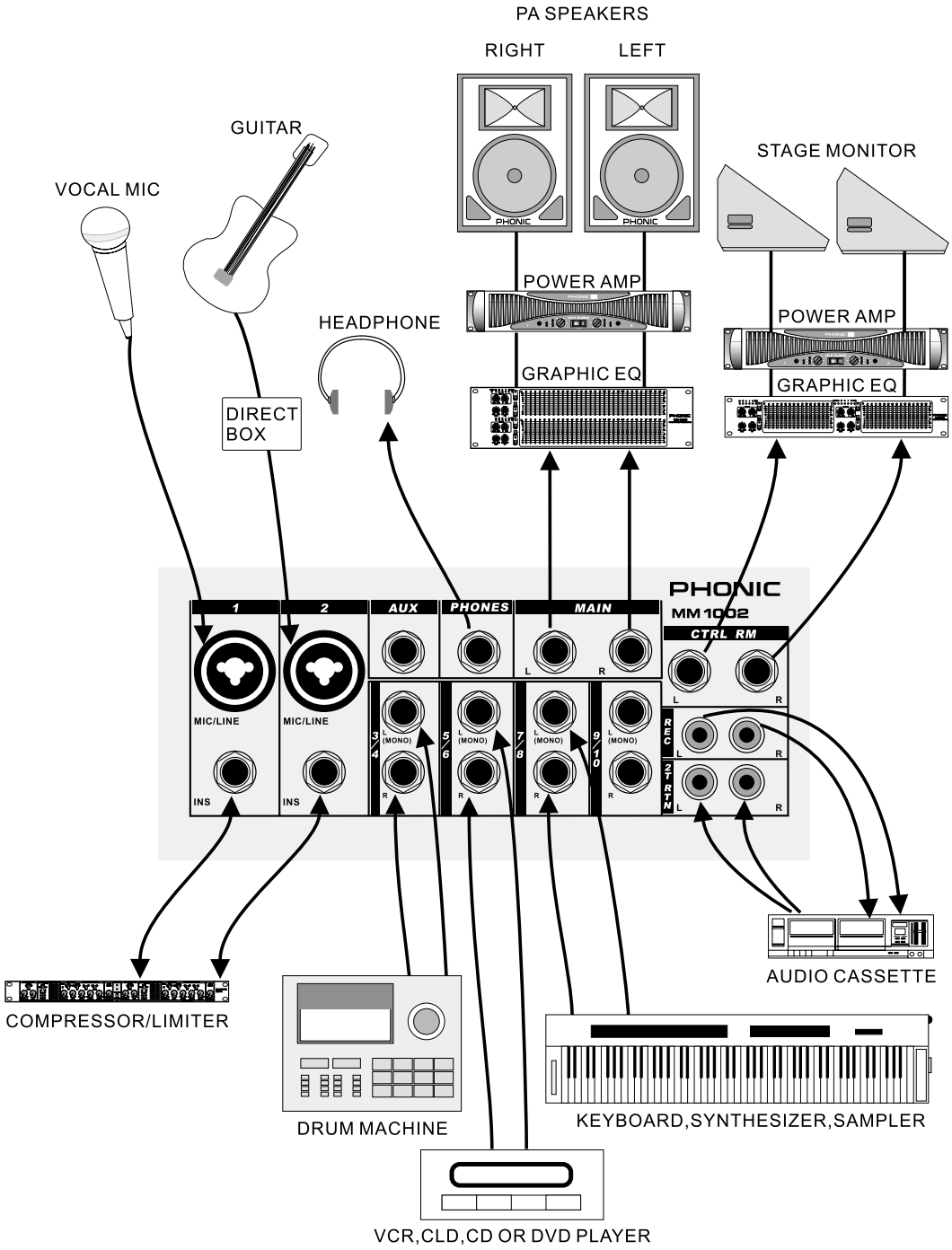
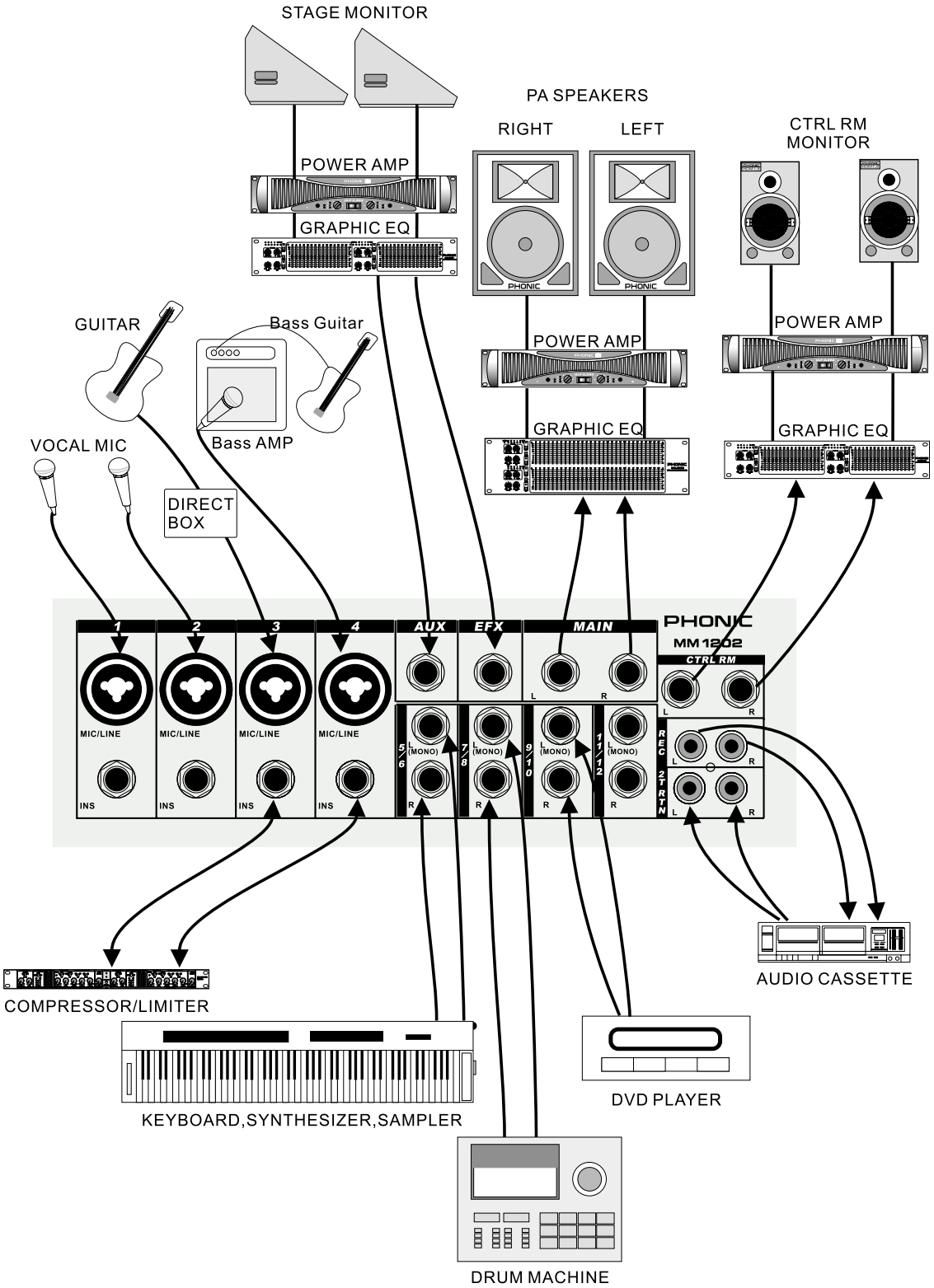
APPLICATIONS

STANDARD CONNECTIONS

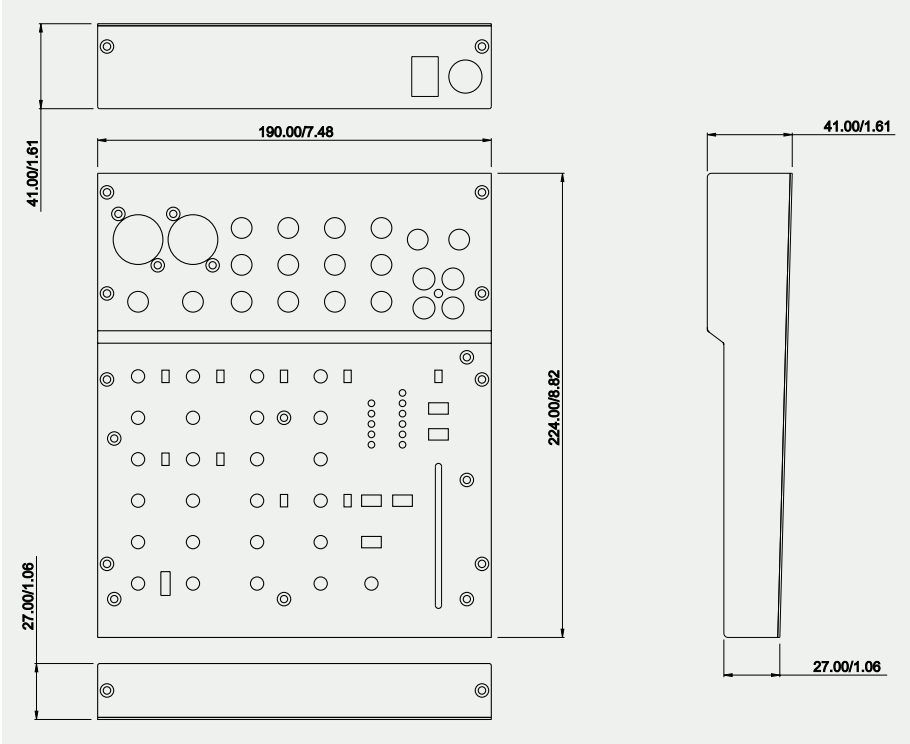


LIVE BAND SETTING

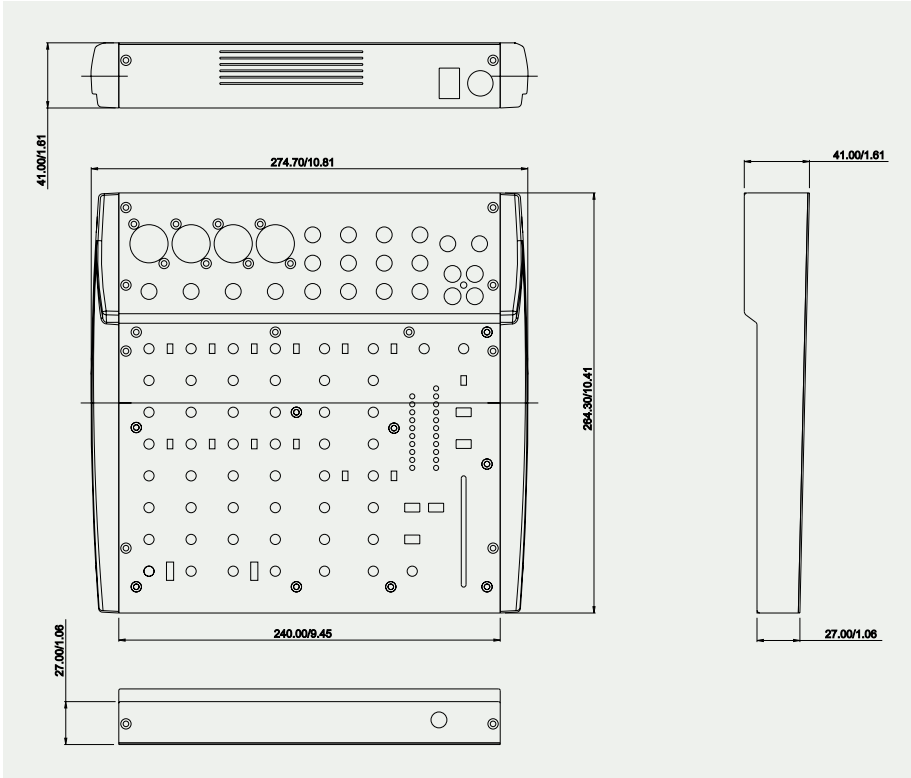


DIMENSIONS

MM1002



MM1202



Measurements are shown in mm/inch.

SPECIFICATIONS

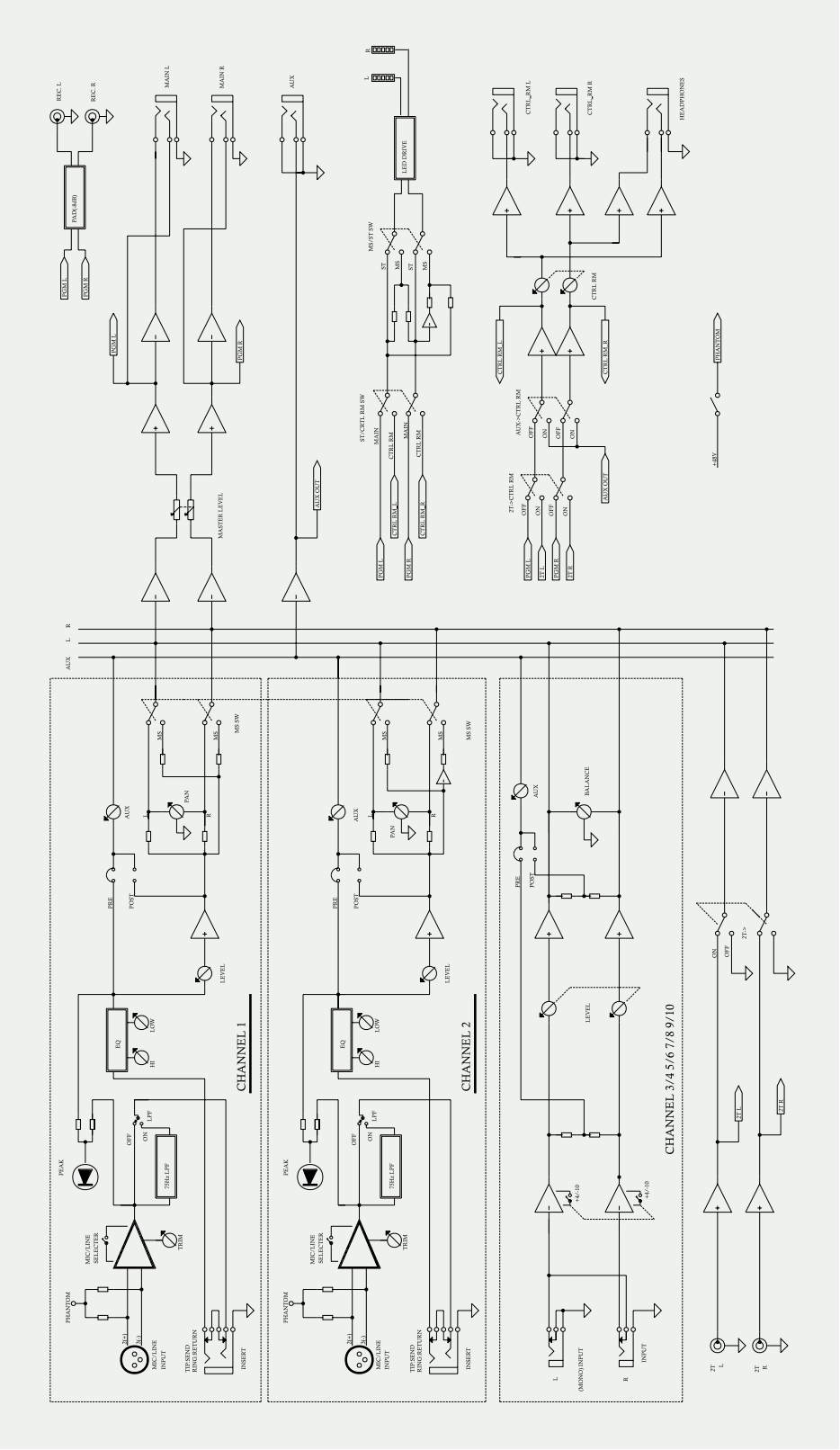
	MM1002	MM1202
Inputs		
Balanced Mono Mic/Line channels	2	4
Balanced Stereo Line Channels	4	4
2T input	1	1
Outputs		
Main L/R stereo	TRS, Bal.	TRS, Bal.
Aux sends	2, TRS, Unbal.	2, TRS, Unbal.
Phones	1	1
Control RM	TRS, Unbal.	TRS, Unbal.
Channel Strips	4	6
Aux controls	1	2
Pan/Balance control	Yes	Yes
Volume Controls	Rotary	Rotary
MS matrix	1	2
Inserts	2	4
Master Section		
Aux send masters	1	2
Master Aux send Solo	Yes	Yes
Phones/Control RM Level Control	Yes	Yes
Phones/Control RM Source Switching.	Yes	Yes
Faders	ST/60mm	ST/60mm
Metering	MS/ST	MS/ST
Number of channels	2	2
Segments	5	10
Phantom Power Supply	+48VDC	+48VDC
Switches	Master	Master
Noise (20Hz to 20KHz bandwidth, line inputs to main L/R outputs, all channels assigned, panned L/R)		
Master @ unity, channel fader down.	-89dBu	-89dBu
Master @ unity, channel fader @ unity.	-86dBu	-86dBu

	MM1002	MM1202
S/N ration, ref to +4	>90dB	>90dB
THD (Any output, 1KHz @ +14dBu, 20Hz to 20KHz, channel inputs)	<0.005%	<0.005%
CMRR (1 KHz @ -60dBu, Gain at maximum)	80dB	80dB
Crosstalk (1KHz @ 0dBu, 20Hz to 20KHz bandwidth, channel in to main L/R outputs)		
Channel fader down, other channels at unity	<-83dB	<-83dB
Channel muted, other channels at unity	NA	NA
Frequency Response (Mic input to any output)		
20Hz ~ 60KHz	+0/-1dB	+0/-1dB
20Hz ~ 100KHz	+0/-3dB	+0/-3dB
Maximum Levels		
Mic preamp input	+10dBu	+10dBu
All other inputs	+22dBu	+22dBu
Balanced outputs	+28dBu	+28dBu
Un-balanced outputs	+22dBu	+22dBu
Impedances		
Mic preamp input	2 KΩ	2 KΩ
All other inputs (except inserts)	10 KΩ	10 KΩ
RCA 2T outputs	1.1K ohm	1.1K ohm
All other outputs	100 ohm	100 ohm
Equalization	2-band, +/-15dB	3-band, +/-15dB
Low EQ	80Hz	80Hz
Mid EQ	NA	2.5KHz
Hi EQ	12KHz	12KHz
Low cut filter	75Hz(-12dB/oct)	75Hz(-12dB/oct)
Microphone Preamp E.I.N. (150 ohm terminated, max gain)	<129.5dBm	<129.5dBm
Power Consumption	20 watts	20 watts
Weight	1.5 kg (3.3 lbs)	3 kg (6.6 lbs)
Dimensions(WxHxD)	190x56x233 mm	240x56x276 mm
	(74.8"x22.0"x91.7")	(94.5"x22.0"x108.7")

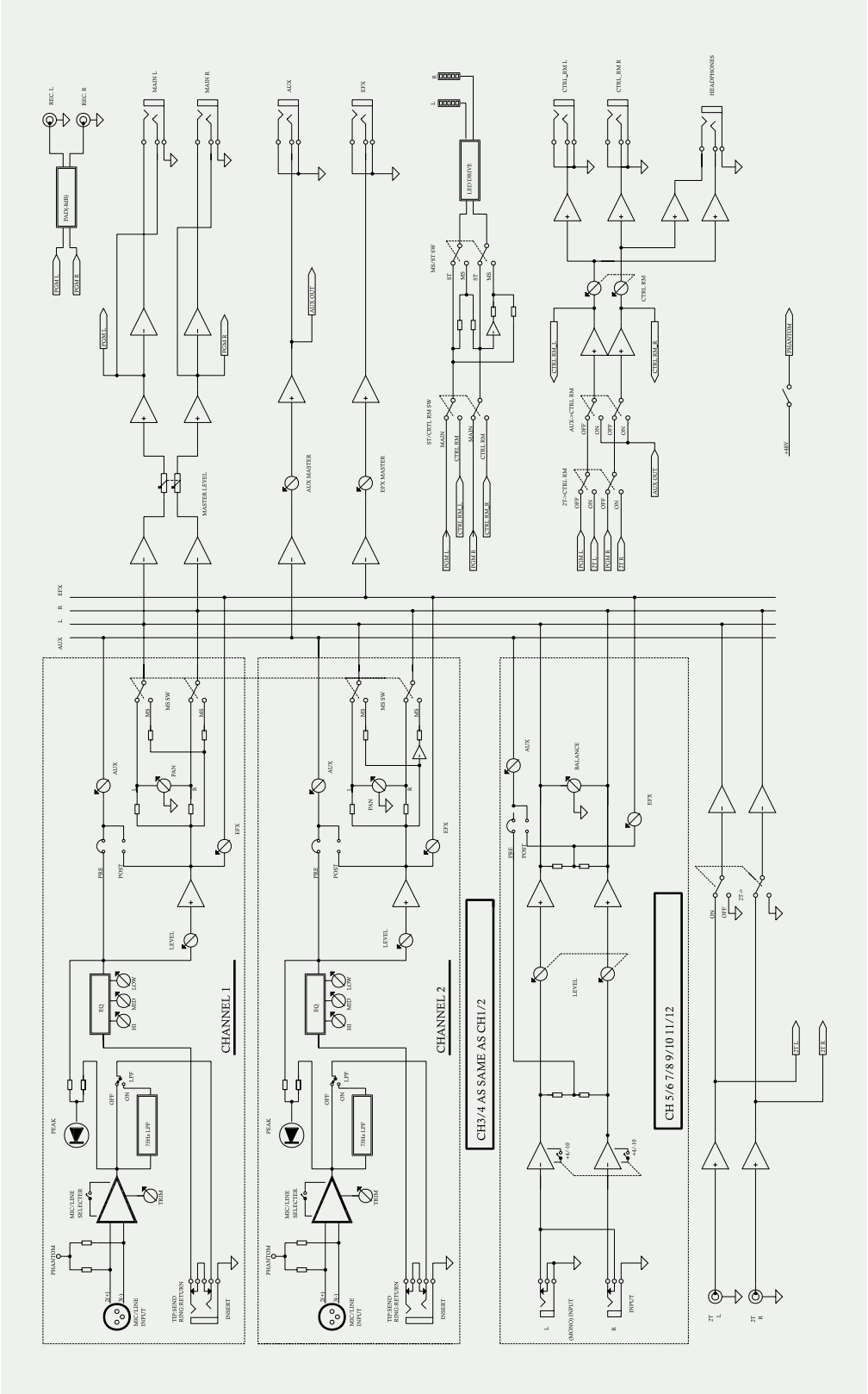
Due to continuous product improvement, the specifications are subject to change without notice.

SYSTEM BLOCK DIAGRAMS

MM1002



MM1202



REFERENCE BOOKS

Phonic recommends the following books for those interested in advanced audio engineering and sound system operation:

- Sound System Engineering by Don and Carolyn Davis, Focal Press, ISBN: 0-240-80305-1
- Sound Reinforcement Handbook by Gary D. Davis, Hal Leonard Publishing Corporation, ISBN: 0-88188-900-8
- Audio System Design and Installation by Philip Giddings, Focal Press, ISBN: 0-240-80286-1
- Practical Recording Techniques by Bruce and Jenny Bartlett, Focal Press, ISBN: 0-240-80306-X
- Modern Recording Techniques by Huber & Runstein, Focal Press, ISBN: 0-240-80308-6
- Sound Advice – The Musician's Guide to the Recording Studio by Wayne Wadham, Schirmer Books, ISBN: 0-02-872694-4
- Professional Microphone Techniques by David Mills Huber, Philip Williams. Hal Leonard Publishing Corporation, ISBN: 0-87288-685-9
- Anatomy of a Home Studio: How Everything Really Works, from Microphones to Midi by Scott Wilkinson, Steve Oppenheimer, Mark Isham. Mix Books, ISBN: 091837121X
- Live Sound Reinforcement: A Comprehensive Guide to P.A. and Music Reinforcement Systems and Technology by Scott Hunter Stark. Mix Books, ISBN: 0918371074
- Audiopro Home Recording Course Vol 1: A Comprehensive Multimedia Audio Recording Text by Bill Gibson. Mix Books, ISBN: 0918371104
- Audiopro Home Recording Course Vol. 2: A Comprehensive Multimedia Audio Recording Text by Bill Gibson. Mix Books, ISBN: 0918371201

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