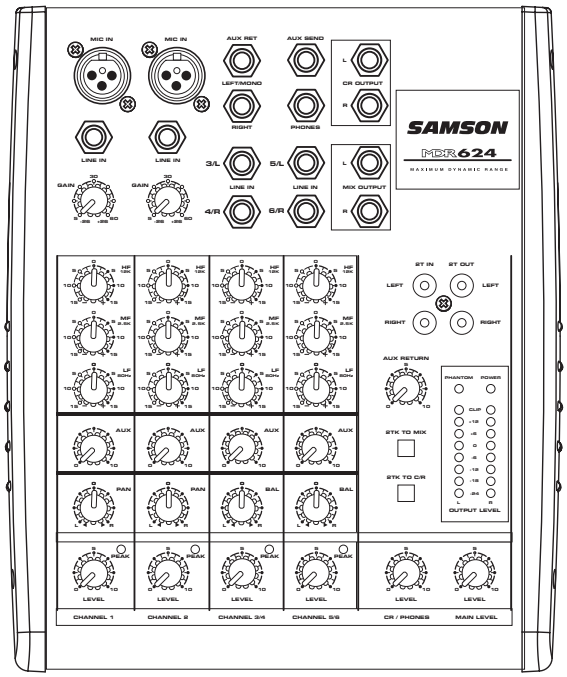
MDR624

Maximum Dynamic Range



SIX CHANNEL MIXER

Owners Manual

MDR Series Mixers

SAMSON AUDIO

Introduction

Congratulations on your purchase of the Samson MDR624 mixer! The MDR624 is a six channel mixer, with two low noise microphone pre-amps. In addition to the two mono Mic/line inputs, there are two channels with left and right inputs to handle stereo signals. For added flexibility, you can change the tone quality of your microphones or other line inputs by using the three-band channel equalizers. Connecting external effects like a reverb or digital delay to the MDR624 is easy thanks to the Aux send on each channel along with the stereo Aux Return in the master section. LED indicators for Power, Phantom, Peak and Main Output Level make it easy to keep your levels set correctly and minimize distortion. Clean, clear sound reproduction, packaged in a rugged enclosure, ensure reliable high quality sound from performance to performance. Optimized for recording, live sound reinforcement and commercial installations, the MDR624 is an ideal mixer solution offering big sound in a compact package.

In these pages, you'll find a detailed description of the features of the MDR624 mixer, as well as a description of its front and rear panels, step-by-step instructions for its setup and use, and full specifications. You'll also find a warranty card enclosed—please don't forget to fill it out and mail it in so that you can receive online technical support and so we can send you updated information about these and other Samson products in the future.

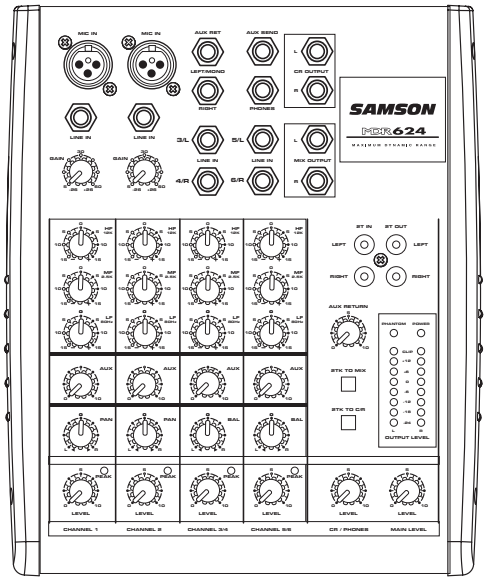
With proper care and adequate air circulation, your MDR624 will operate trouble free for many years. We recommend you record your serial number in the space provided below for future reference.

Serial number: _____

Date of purchase: _____

Should your unit ever require servicing, a Return Authorization number (RA) must be obtained before shipping your unit to Samson. Without this number, the unit will not be accepted. Please call Samson at 1-800-3SAMSON (1-800-372-6766) for a Return Authorization number prior to shipping your unit. Please retain the original packing materials and if possible, return the unit in the original carton and packing materials.

MDR624 Features

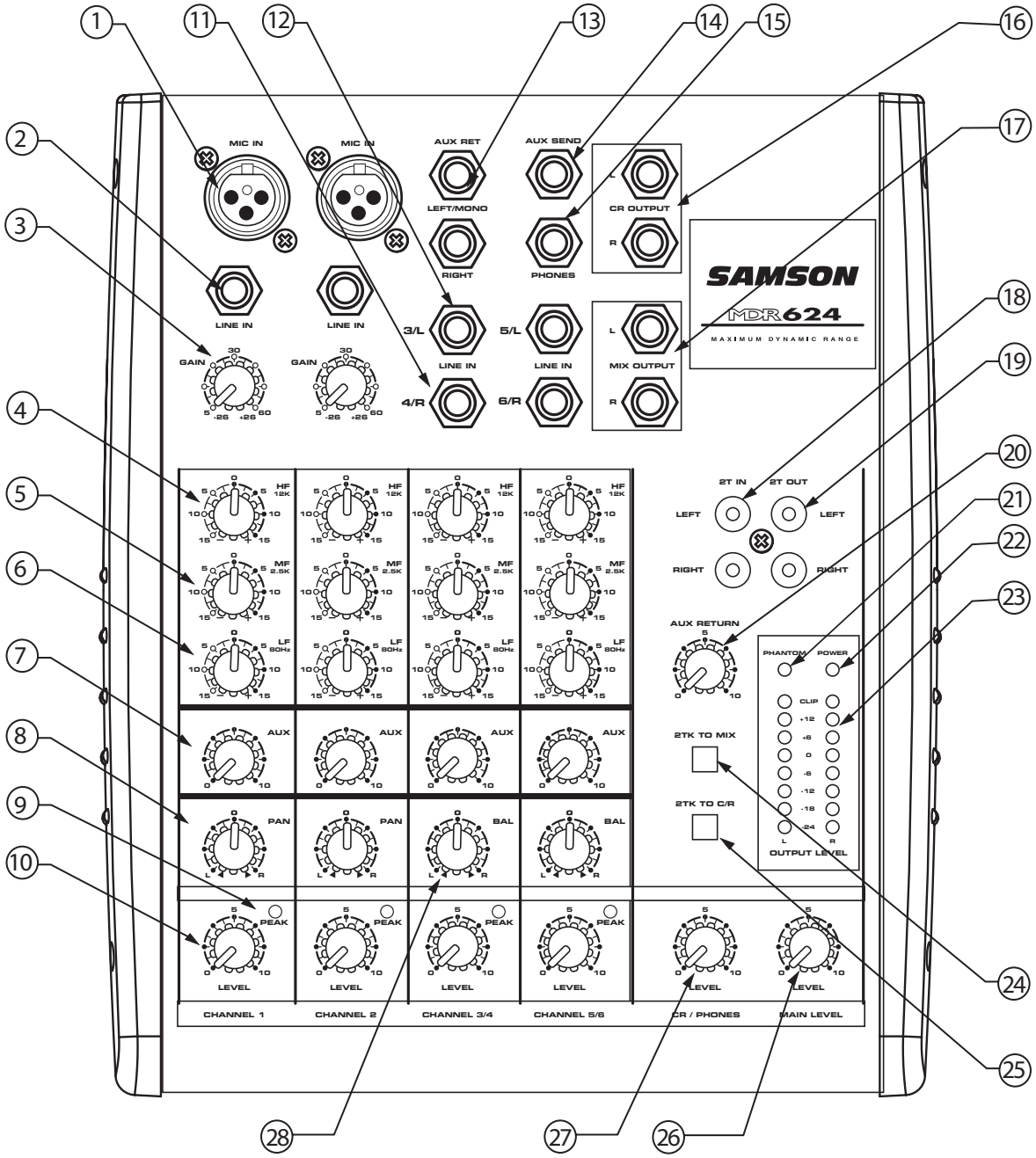


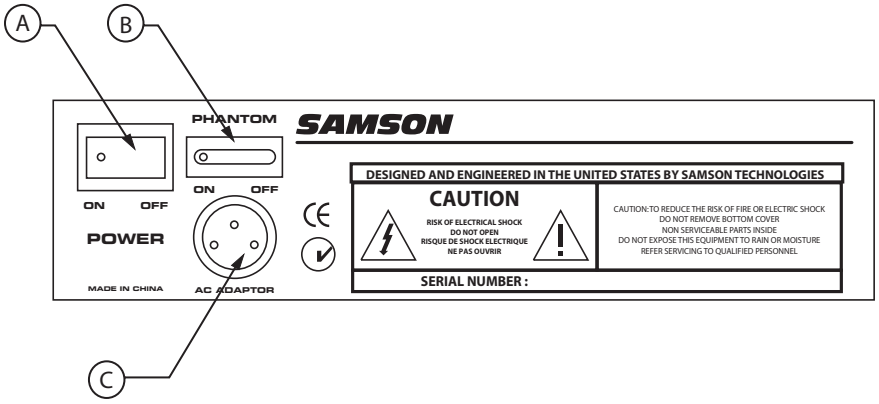
The Samson MDR624 six channel mixer, is a comprehensive, all-in-one solution for live sound, recording, fixed installation and post production applications. Here are some of its main features:

- Six channels – Two Mic/Line plus two Stereo inputs.
- Flexible design topology ideal for live sound, recording and post production.
- 2 Track To Mix Level control allows you to mix in a CD, DAT, Cassette, Computer Sound Card or Mini Disk with the channel faders.
- Three-band channel equalizer, +/-15dB at 80Hz, 2.5 KHz and 12KHz provides precise and musical results in sound shaping.
- An Auxiliary Send for external effects, on stage monitor mix, or headphone mixing.
- Eight segment LED Meter with VU ballistics displays the main MIX output.
- High quality, low noise, discrete microphone pre-amplifiers with 48-Volt phantom power, provide Maximum Dynamic Range and transparent audio.
- Advanced circuit design using discrete components and high quality, low noise op-amps carefully selected at each stage of the signal path.
- Quality build and rugged construction ensure reliable performance from venue to venue and session to session.
- Three-year extended warranty.

Controls and Functions

Front and Rear Panel Layout





Front and Rear Panel Layout

Front and Rear Panel Layout

FRONT PANEL

1. **MIC** – Input connector for Low-Noise Microphone pre-amp.
2. **LINE** –Input connector for Line level inputs.
3. **GAIN** – Used to set the input level of the mic pre and line input.
4. **HIGH FREQUENCY** – Controls the high band of the Channel Equalizer, +/- 15 dB at 12KHz.
5. **MID FREQUENCY** – Controls the mid band of the Channel Equalizer, +/- 15 dB at 2.5KHz.
6. **LOW FREQUENCY** – Controls the low band of the Channel Equalizer, +/- 15 dB at 80Hz.
7. **AUX** – Pre fader auxiliary send that can be used with an external effects processor, or to create a cue or monitor mix.
8. **PAN** – Controls the channel's position between left and right in the stereo bus.
9. **PEAK** – Red LED will illuminate indicating when the GAIN has been adjusted too high.
10. **LEVEL** – Audio taper fader provides smooth control over level changes.
11. **RIGHT LINE** – 1/4-inch phone input connector for the right line input for the stereo channels.
12. **LEFT LINE** - 1/4-inch phone input connector for the Left Line input for the stereo channels.
13. **AUX RET** – Input connector from external line level sources.
14. **AUX SEND** – Line level output from the Auxiliary bus.
15. **HEADPHONE JACK** – Connect stereo headphones here.
16. **CR OUTPUT**– Left and Right Control Room output connectors for connecting a monitor system.
17. **MIX OUTPUT** – Left and Right main Mix output connectors.
18. **2 TRACK INPUTS** – Connect the output from a DAT, Cassette, Mini Disk or Hard Disk Recording system.
19. **2 TRACK OUTPUTS** – Connect to the input of a DAT, Cassette, Mini Disk or Hard Disk Recording system.
20. **AUX RETURN** – Used to mix in level of the effects return.
21. **PHANTOM** – Indicates that the 48 Volt Phantom Power is on.
22. **POWER** – Indicates the MDR624 is powered up.
23. **OUTPUT METER** - Eight segment display with VU ballistics indicates main Mix level.
24. **2 TRACK TO MIX** - Switch used to mix the 2 track input with the mix from the channel inputs.
25. **2 TRACK TO CR** – Switches between the main Mix and the 2 Track in the Control Room output.
26. **MAIN LEVEL** – Used to control the overall volume of the Left and Right main Mix outputs.
27. **C ROOM/HEADPHONE** – Adjusts the volume of the control room speakers or headphones.
28. **BALANCE** – Controls the channel's position between left and right in the stereo inputs.

REAR PANEL

A. **POWER** – Switches on the MDR624's main power.

B. **PHANTOM** – Engages the 48-Volt Phantom power supply to microphone pre-amps.

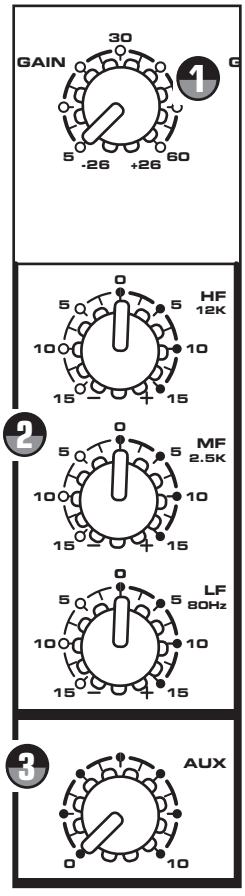
C. **AC ADAPTOR INLET** – Connect External AC power supply here.

Controls and Functions
MONO INPUT CHANNEL SECTION

The following section details each part of the MDR624's input channels including the GAIN control, 3-BAND EQ, AUX send, PAN, BALANCE and LEVEL controls. The input channels One and Two on the MDR624 feature high quality, discrete transistor pre-amps providing transparency and extended dynamic range on standard XLR connectors. Channels 3/4 and 5/6 are stereo input channels that accept line level signals on standard 1/4" phone connectors for either balanced (TRS – TIP/ RING/SLEEVE) or unbalanced (TS – TIP/SLEEVE) connections. *A detailed explanation of the Input, as well as the Output connectors, can be found in the following section "Input and Output Connections" on page 11 of this manual.*

1 GAIN

The MDR624's pre-amp stage has a variable GAIN control, which is used to set the sensitivity of the input. Because the input can accept either a mic or line level signal, the GAIN control operates in two ranges based on which input is being used. When a microphone is connected to the input, the range is 5 to 60dB, and when a line is connected, the range is –26 to +26dB. *For more information on using the GAIN control see the section "CONNECTING MICROPHONES AND INSTRUMENTS" on page 12 of this manual.*



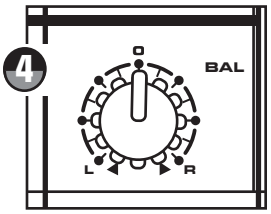
2 CHANNEL EQUALIZER

The MDR624 input channels feature a 3-band equalizer allowing you to adjust the high, mid, and low frequencies independently on each channel. The channel's frequency response is flat when the knobs are in the "12:00" position. Rotating the knob towards the right will boost the corresponding frequency band by up to 15dB, and rotating it towards the left will cut the frequency by up to 15dB. The frequency centers, range of boost or cut, and equalizer type for each band are as follows:
High: 12KHz +/- 15dB shelving type
Mid: 2.5KHz +/- 15dB peaking type
Low: 80Hz +/- 15dB shelving type

3 AUX SEND

The AUX section is often used for a monitor mix in a live sound mixing, or for a headphone mix in a recording application. Each input channel includes an Aux send which controls the amount of that channel's signal that is sent to the Aux bus. *For more information on using the AUX control see the section "SENDING AN INDEPENDENT MIX TO THE MONITOR SPEAKERS" on page 13 of this manual.*

4 BALANCE (Stereo Inputs Only)



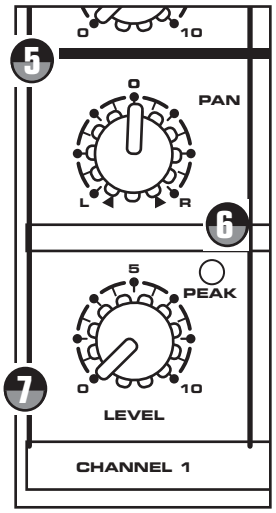
The MDR624's BALANCE control is used to place or position a mono input into the stereo main Left and Right MIX bus. For a stereo input, the balance control is used to center the sound between the Left and Right Mix bus. You can create a stereo image by panning some input signals to the left and others to the right.

5 PAN (Mono Inputs Only)

The MDR624's PAN control is used to place or position the mono signal into the stereo main Left and Right MIX bus. You can create a stereo image by panning some input signals to the left and others to the right. The MDR624's PAN control is a Power-Pan circuit, which includes a 3dB dip in the center position. This is desirable since there's a 3dB increase in gain when the mono input signal is heard in both the Left and Right MIX bus.

6 PEAK LED

The MDR624's MIC/LINE pre-amp also includes a CLIP LED which, when illuminated, indicates that the signal is peaking or overloading. To reduce distortion, lower the GAIN control to keep this LED from staying on.



7 FADER

The MDR624's rotary input FADER controls the overall channel level. The input FADER features an audio taper and no detents for smooth fades.

Controls and Functions

MASTER SECTION

The MDR624's Master section includes the master level controls for the MAIN mix, AUX and CR (Control Room) / PHONES output, as well as, 2-track assign switches and LED metering for power and level. The following section details the function controls and switches in the Master section.

8 MAIN LEVEL

The master MAIN control is the overall volume control for the left and right mix bus. The MAIN LEVEL affects both the Control ROOM signal which is output to the speakers and the line level signal which is output from the MIX OUT jacks.

9 CR / PHONES

The C/ROOM + PHONES control is used to set the level sent to the control room outputs, and also to the head-phone jack.

2 TRACK INPUT AND OUTPUT

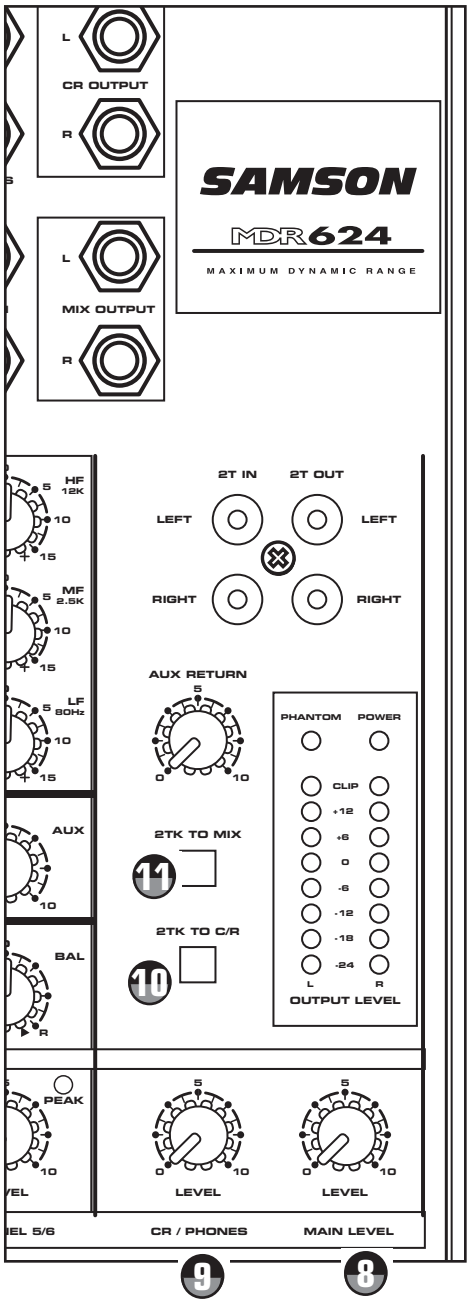
The MDR624's 2 Track section provides the connections for playback and recording for an external device such as a DAT, cassette recorder, CD or Mini Disk.

10 2TK TO CR

The 2TR TO CR switch is used to assign the 2TR input to the Control Room output. If you push down the 2TK TO CR button, signal will be routed into the left and right Control Room output and will be adjusted by the CR / PHONES control knob.

11 2TK TO MIX

The 2TR TO MIX switch is used to assign the 2TR input to the MAIN mix bus. If you push the 2TR TO MIX button, the signal present at the 2 TRACK IN will be routed to the left and right MAIN output and the level will be controlled by the MAIN LEVEL knob.



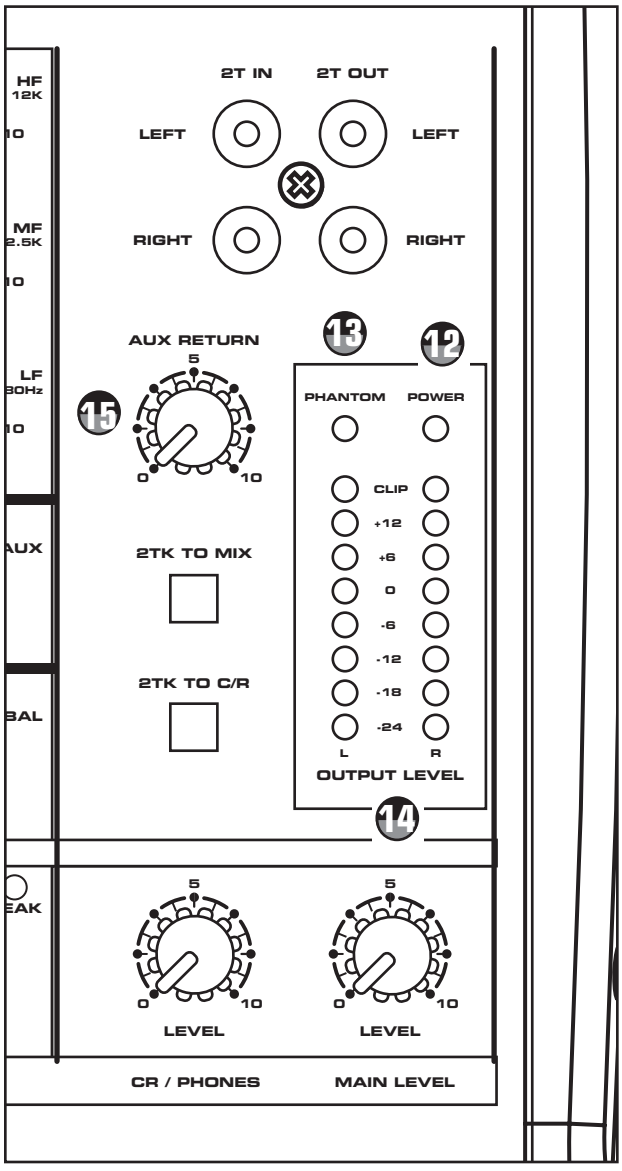
MASTER SECTION - continued

12 POWER LED

The Power LED lights up to indicate that the main POWER switch (located on the rear panel) is on.

13 - Phantom Power LED

This LED illuminates indicating that the 48 volt phantom power is applied to the microphone pre-amps enabling use with condenser microphones. The +48V LED will light up when the Phantom Power switch (located on the rear panel) is switched to the ON position.



14 Output Level Meter

The OUTPUT LEVEL METER allows you to monitor the level of the signal which is being sent to the MIX OUT jacks.

NOTE: To avoid distortion, adjust the Main Level control so that the 0 indicator LED lights occasionally.

Auxiliary Return

The MDR624 has a stereo auxiliary return, which can be accessed via the pair of 1/4-inch phone jacks located on the top panel. The Auxiliary Return can be used to connect any stereo line level signal, but they are primarily used to connect the output of external effects processors.

15 AUX RET

This adjusts the amount of signal that is coming from the AUX RET jacks to the MAIN bus. *For more information on using the AUX control see the section "USING AN EXTERNAL EFFECT" on page 13 of this manual.*

MDR624 Input and Output Connections

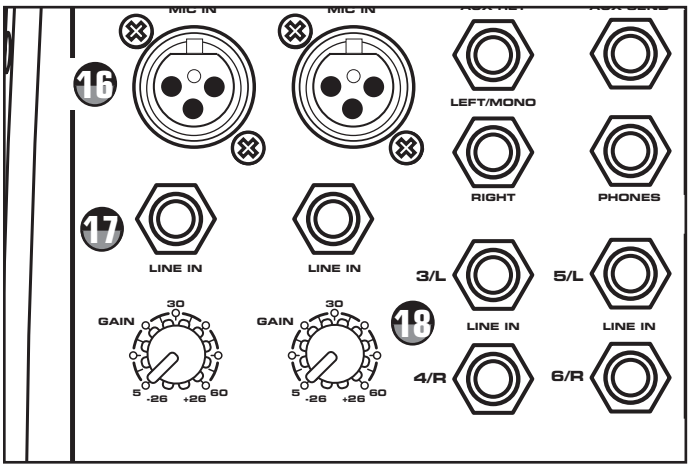
CHANNEL 1 – 6 MIC and LINE INPUTS

The MDR624's channels 1 and 2 mono input channels each have a 1/4-inch connector for line level inputs and XLR connectors for the MIC inputs. Channels 3/4 and 5/6 stereo input channels each have 1/4-inch connectors for line level inputs. By using the GAIN control on channels 1 + 2, you can connect a variety of signal sources from microphones to line level devices such as synthesizers, and drum machines. All the LINE and MIC inputs are balanced. The MIC inputs are compatible with microphones with output impedances of 50~600 Ohms and the LINE inputs are compatible with line level devices of 600 Ohms.

NOTE: It is not possible to simultaneously use both the LINE and MIC inputs on the same channel. Use only one of the inputs for the appropriate source on each channel.

Following below is a detailed description of the MDR624's input and output connectors.

16 Microphone Input - Mono Input Channels



Use these inputs to connect Low Impedance microphones and low level signals from direct boxes. The MIC inputs have a nominal operating level of –50dB through -20dB. The MIC inputs also feature +48V phantom power, allowing you to use condenser microphones. The Phantom Power switch (located on the MDR624's rear panel) enables phantom power on all the microphone inputs when set to the ON position. XLR Connector pin-out - Pin 1: Ground, Pin 2: Hot (+), Pin 3: Cold (-)

17 Line Level Input - Mono Input Channels

Use these inputs to connect synthesizers, drum machines, effects processors or any line-level signal. The LINE inputs have a nominal operating level of -40dB through - 10dB. TRS phone jacks Connector pin-out - Sleeve: Ground, Tip: Hot (+), Ring: Cold (-)

18 Line Level Input - Stereo Input Channels

You can connect the outputs from stereo devices such as synthesizers, drum machines, effects processors or any stereo line-level signal. Use the LEFT input when connecting a mono input signal to the Stereo Input channels. The LINE inputs have a nominal operating level of -40dB through - 10dB. TRS phone jacks Connector pin-out - Sleeve: Ground, Tip: Hot (+), Ring: Cold (-)

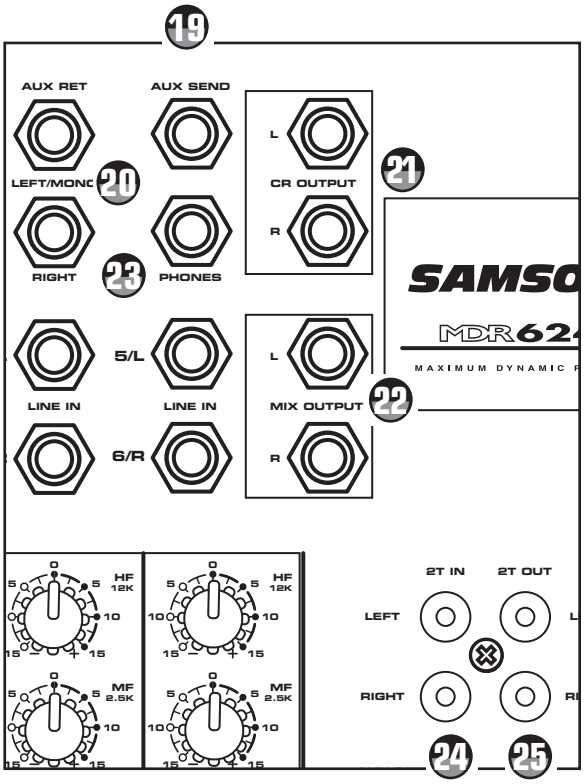
MDR624 Input and Output Connections

MASTER SECTION INPUT AND OUTPUT JACKS

The MDR624 features several output connectors allowing you to interface a variety of external devices. A stereo recording device, such as a cassette recorder, can be connected to the 2 Track jacks, and power amplifiers or powered monitors can be connected to the CONTROL ROOM and MAIN output jacks.

19 AUX Send

The signal present at the AUX output is sent from the AUX bus, which is fed from the AUX send on the input channels. The AUX output can be used as the MONITOR MIX bus in a live sound situation by connecting the output to a power amp and monitor speaker.



20 AUX RETURN LEFT/RIGHT

The AUX RETURN LEFT/RIGHT are stereo inputs that are generally used to connect the outputs of an effects processor, but can also accept the signal from any line level source like a keyboard, recorder and even another mixer. The signal connected to the AUX RETURN LEFT/RIGHT will feed the main LEFT/RIGHT MIX bus. The overall level is controlled by the AUX RET knob located in the master section on the front panel. Use the LEFT/MONO input when connecting a mono input signal to the AUX RETURN.

21 CONTROL ROOM LEFT/RIGHT OUTPUT

The Control Room outputs are used to connect a studio monitor system. The Control Room outputs have the same output as the L/R MIX, however, the level can be adjusted independently from the main mix using the C ROOM/HEADPHONES control.

22 MIX LEFT/RIGHT OUTPUT

In a live sound application, the LEFT/ RIGHT MIX outputs are connected to a power amplifier or powered speakers. In a recording application, the LEFT/ RIGHT MIX outputs are used to connect to the inputs of a stereo device such as computer sound card, DAT, or cassette recorder.

23 HEADPHONE OUTPUT

You can connect a standard pair of stereo headphones to the PHONES jack and depending on the position of the 2T TO CR switch, you will hear either the 2-Track input or the MAIN mix.

24 2TR INPUT

The MDR624 features dual RCA connectors for the left and right 2-track input. You can use these inputs to connect a CD, Cassette, Mini Disk, DAT or the output from a computer sound card. To listen to the input connected to the 2T IN, be sure to check the position of the 2T To Mix and 2T TO CR switches. *For more information on using the 2 Track inputs, see the section "PLAYING BACK A CD USING 2T TO MIX " on page 13 of this manual.*

25 2TR OUTPUT

If you want to record the mix from your MDR624, you can use the 2-track OUT connectors. The dual RCA connectors can be connected to a CD, Cassette, Mini Disk, DAT or recorder, even the input of a computer sound card for hard disk recording. *For more information on using the 2 Track outputs, see the section "RECORDING A MIX FROM THE MDR624 " on page 13 of this manual.*

Operating the MDR624

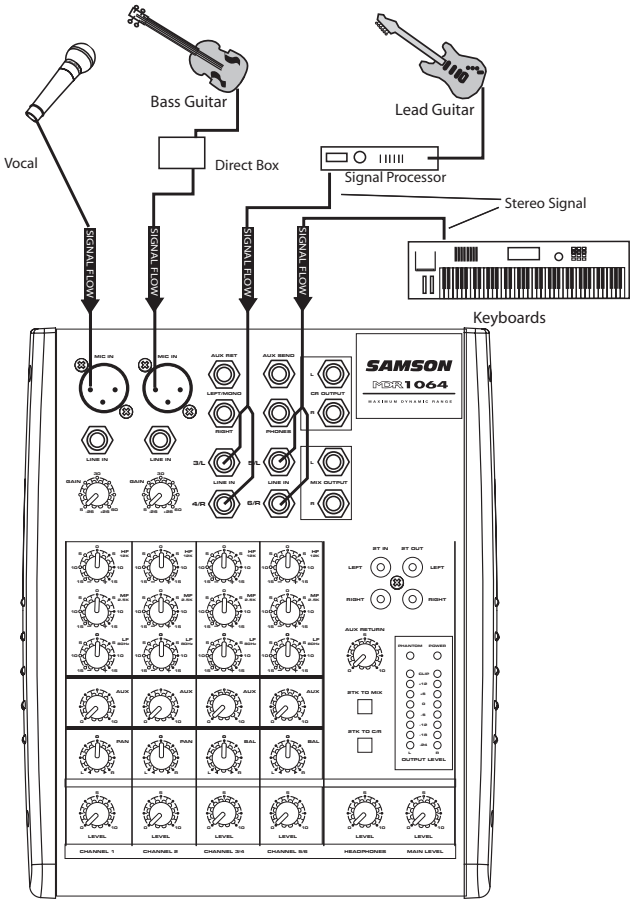
BASIC OPERATION

The following section explains the basic operation of the MDR624.

CONNECTING MICROPHONES AND INSTRUMENTS

1. Before connecting mics or instruments, make sure that the power of all your systems components, including the MDR624, are turned off. Also, make sure that the Left and Right MIX faders are turned all the way down.

2. Connect the cables to your microphones and instruments, and insert the other end of the cable firmly into the appropriate input on the MDR624.



NOTE: SETTING THE INPUT GAIN - When connecting a microphone to channels 1 + 2, it's a good idea to start with the Gain Control turned all the way down. Set the input fader to the "2 o'clock" position and slowly raise the GAIN control until you see the CLIP LED turn on. Now, back the GAIN control down so that the CLIP LED only lights for a short time during the loudest input the channel will see.

3. Switch on the power of any peripheral devices, and then power up the MDR624.

NOTE: It is important to remember the Golden Rule of audio … " **LAST ON, FIRST OFF**". Translated, this means that when turning on your system, you should always turn your power amplifiers or powered monitors on LAST, and when turning your system off, turn your power amps off FIRST. This helps avoid any loud pops caused by inrush current at power up, which can sometimes damage loudspeakers.

4. Turn on your power amp or powered monitors and raise the level control to the manufacturers' recommended operating level.

5. Set the Main Level fader in the MDR624's master section to the "2 o'clock" position.

6. While speaking into the mic (or playing the instrument), adjust the channel Level control so that the "0" LED of the MAIN section peak level meter lights occasionally.

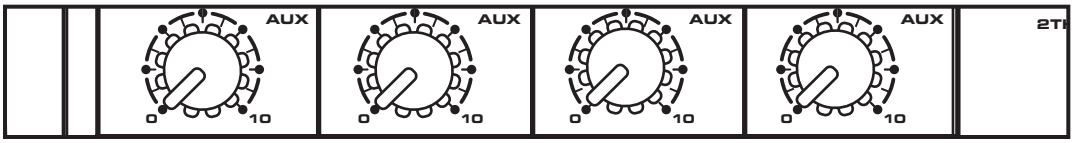
7. You can shape the tone of each channel by adjusting the equalizer controls as desired.

SENDING AN INDEPENDENT MIX TO THE MONITOR SPEAKERS

The MDR624's AUX send can be used to feed a separate set of amplifiers and loudspeakers for stage monitors. This lets you build one stereo mix for the amplifiers and speakers facing the audience and the other mono mix for the amplifiers and monitor speakers facing the musicians.

1. Raise the AUX controls for the channels that you wish to hear from the monitor speakers.

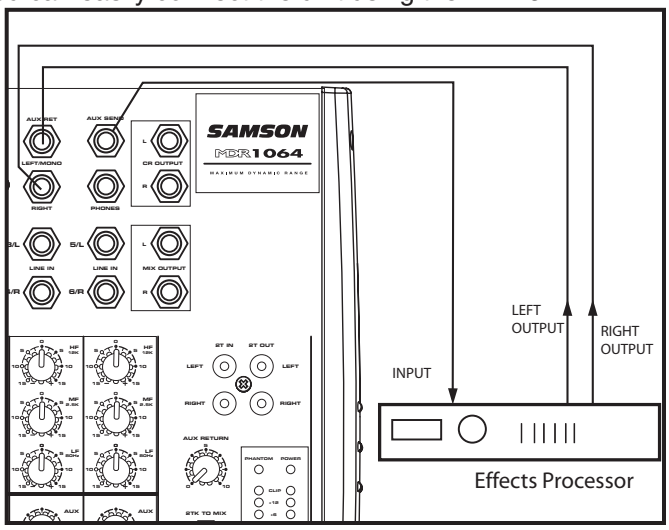
   NOTE: The AUX controls are "PRE-FADER SENDS" which means they are not affected by the FADER level settings of each channel. This allows you to create a mix for the monitors that is independent of the main LEFT and RIGHT MIX.



2. In order to get the most gain from your monitor mix, use an external graphic equalizer (like a Samson S curve 131 or E31i) to cut out any frequencies that cause feedback. For more information, see the diagram on pg. 14.

USING AN EXTERNAL EFFECT

If you want to use an external device for effects processing, you can easily connect the unit using the MDR624 AUX bus. Follow the simple steps below to interface your processor:

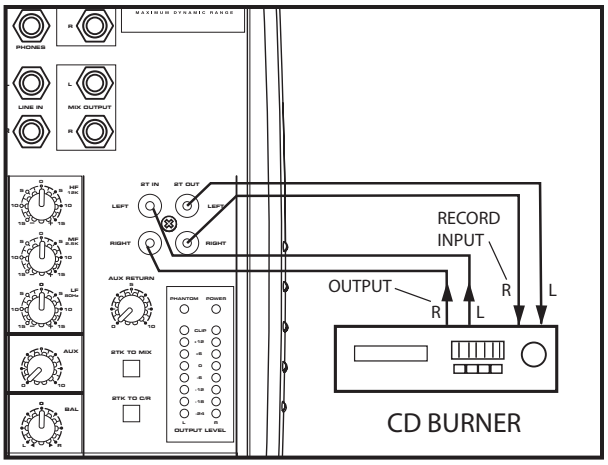


1. Set the L/R mix faders to the "2 o'clock" position.
2. Raise the AUX knobs for the channels to which you want the external effect to be applied.
3. Set the input level of the external effect so that the sound is not distorted and so that the effect's input meter does not indicate a clipped signal.
4. Use the AUX return control to adjust the level of the effects processed by the external effects device.

PLAYING BACK A CD USING 2T TO MIX

The MDR624 has a dedicated input for playing back a CD, Tape or Mini Disk, which is heard in the Control Room and Headphone outputs or the main outputs. Below is a description of how you can play back a CD, Tape or MD using the MDR624's 2 TRACK INPUT.

- Turn the CONTROL ROOM and MAIN LEVEL knob all the way down.
- If you want to hear the 2-track in the Control Room outputs, engage the 2T to CR switch. If you want to hear the 2-track in the the MAIN outputs, engage the 2T TO MIX switch.
- Start playback on the CD, Tape or MD player.
- Now raise the CONTROL ROOM level or main level until you reach a comfortable listening level.

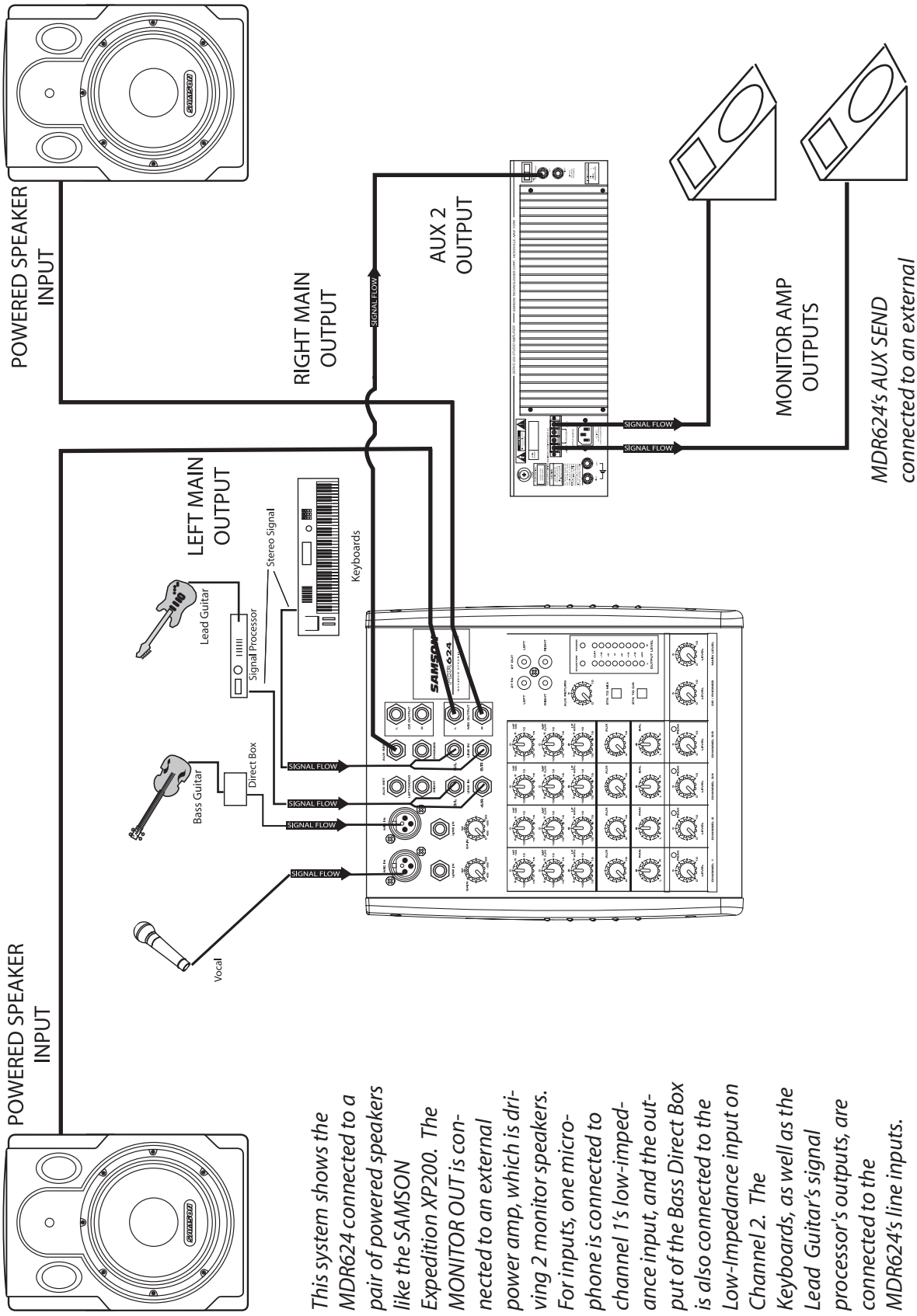


RECORDING A MIX FROM THE MDR624

You can record the audio from the MDR624's mixer section including the MIC, LINE, TAPE IN and AUX inputs to a Cassette deck, MD, DAT or any other type of recorder using the 2 Track outputs. Simply connect the MDR624's 2-Track OUT to the input jacks of the recorder as shown in the diagram to the right. Connect the recorders outputs to the 2 Track in jacks as shown.

MDR624 System Set-Ups

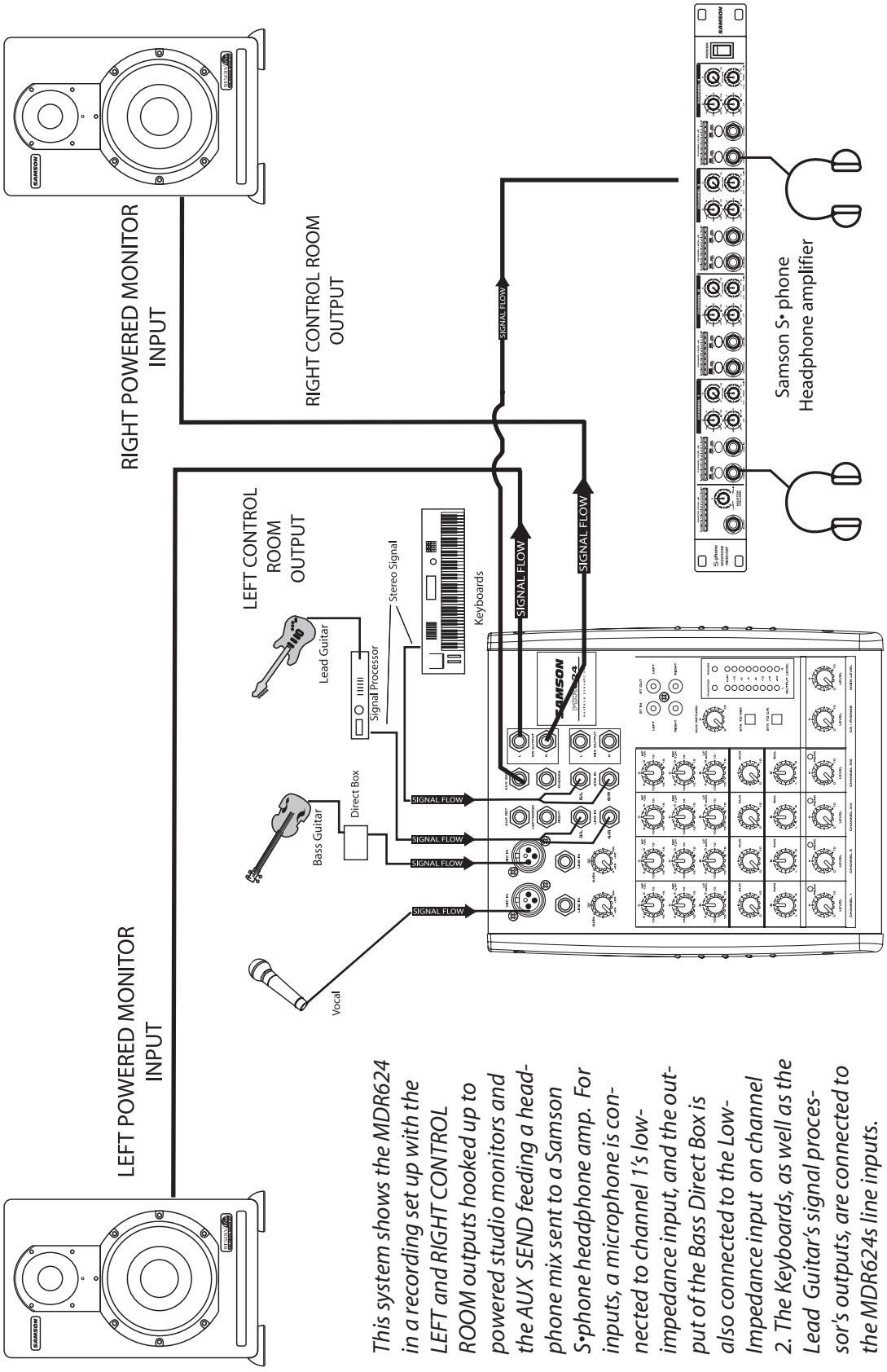
MDR624 LIVE SOUND SET-UP



This system shows the MDR624 connected to a pair of powered speakers like the SAMSON Expedition XP200. The MONITOR OUT is connected to an external power amp, which is driving 2 monitor speakers. For inputs, one microphone is connected to channel 1's low-impedance input, and the output of the Bass Direct Box is also connected to the Low-Impedance input on Channel 2. The Keyboards, as well as the Lead Guitar's signal processor's outputs, are connected to the MDR624's line inputs.

MDR624 System Set-Ups

MDR624 RECORDING SET UP



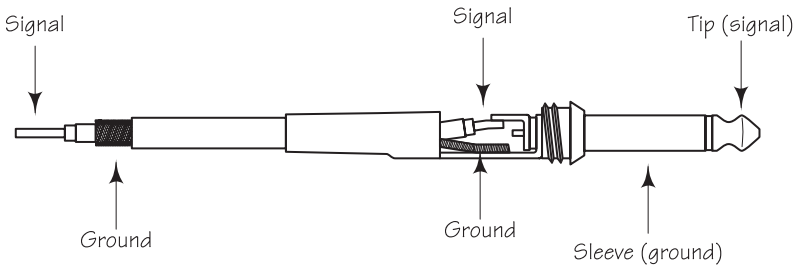
This system shows the MDR624 in a recording set up with the LEFT and RIGHT CONTROL ROOM outputs hooked up to powered studio monitors and the AUX SEND feeding a headphone mix sent to a Samson S•phone headphone amp. For inputs, a microphone is connected to channel 1's low-impedance input, and the output of the Bass Direct Box is also connected to the Low-Impedance input on channel 2. The Keyboards, as well as the Lead Guitar's signal processor's outputs, are connected to the MDR624s line inputs.

MDR624 Wiring Guide

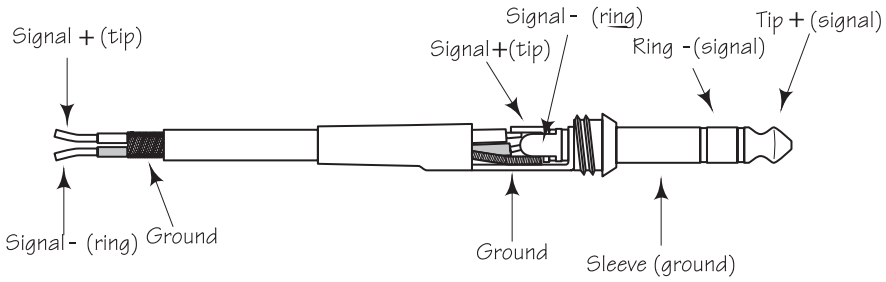
CONNECTING THE MDR624

The are several ways to interface the MDR624 to support a variety of applications. The MDR624 features balanced inputs and outputs, so connecting balanced and unbalanced signals is possible.

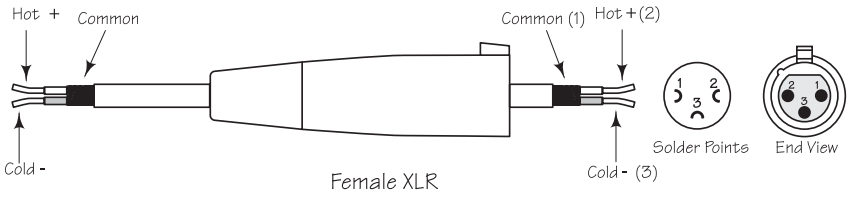
Unbalanced 1/4" Connector

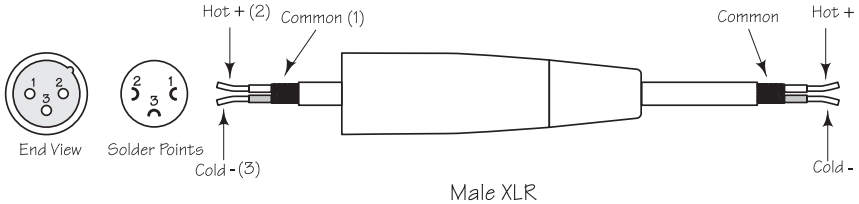


Balanced TRS 1/4" Connector



XLR Balanced Wiring Guide





MDR624 Specifications

Mono input channels

Microphone input	electronically balanced, discrete input configuration
Frequency response	10Hz to 45kHz, +0/- 3dB
Distortion (THD&N)	0.05% at +4dBu, 1kHz
Gain range	5dB to 60dB(MIC)
SNR (Signal to Noise Ratio)	110dB
Line input	electronically balanced
Frequency response	10Hz to 45kHz, +0/ -3dB
Distortion (THD&N)	0.05% at +4dBu, 1kHz
Sensitivity range	-40dBu to -10dBu

Stereo input channels

Line input	balanced
Frequency response	10Hz to 55kHz,+0/-3dB
Distortion (THD&N)	0.05% at +4dBu, 1kHz

Impedances

Microphone input	3.6Kohm
All other inputs	10Kohm or greater
Tape out	1Kohm
All other outputs	120ohm

Equalization

Hi shelving	+/- 15dB @12kHz
Mid bell	+/- 15dB @2.5kHz
Low shelving	+/- 15dB @80Hz

Main Mix Section

Noise(Bus noise)	Fader 0 dB, channels muted:100.0dBr (ref.:+4dBu) Fader 0dB, all input channels assigned and set to UNITY gain: -90dBr(ref.: 4dBu)
Max output	+22dBu balanced
AUX Return gain range	0 to +15dB
AUX Send max out	+22dBu

Power supply (AC/AC Adaptor)

Main Voltage	USA/Canada 95-120V~,60Hz
Europe	210-230V~,50Hz
U.K./Australia	240V~,50Hz
Power Consumption	10Watts

Physical

Dimension	(W, D, H) 187mm 257mm 36/50mm
Net weight	3.7 lb. (1.7 kg) Without Adaptor

Block Diagram