

MIXER ANATOMY  
MIXER APPLICATIONS  
HOOKUP DIAGRAMS  
MIXER TIPS  
MIXER SPECIFICATIONS  
BLOCK DIAGRAMS  
AUDIO GLOSSARY  
NEW IMPROVED BACK COVER

# MACKIE®

## COMPACT MIXER REFERENCE GUIDE



LOUD Technologies Inc. is always striving to improve our products by incorporating new and improved materials, components, and manufacturing methods. Therefore, we reserve the right to change the specifications, details, and operating details of our products at any time without notice.

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# Introduction

## Goal of this book

Audio engineering is a combination of science and art. This book will help you to thoroughly understand what's under the hood so that you can apply the science as you develop your art. The intent is to tell you a whole lot more about mixers than you'd learn from a typical instruction manual. This is a technical reference, so at times we'll get technical.

## Organization

There are many interrelated topics to visit when learning about a mixer. This book is divided into five main sections:

- The Mixer Anatomy section is an introduction to mixers in general, with an emphasis on signal flow (how a signal gets from input to output) followed by a detailed discussion of each control you'll find on a Mackie mixer.
- The Mixer Applications section is a series of application notes, including hookup diagrams and suggestions for operation.
- The Mixer Tips section contains some general tips and more detailed articles on important technical subjects.
- The Mixer Specifications section contains.. well.. specifications of the Mackie mixers described in this book. It also shows block diagrams, dimension drawings, and layouts of the mixer front and rear panels.
- A Glossary of useful audio terms has been added at the end.

Each section has its own set of chapters, and each page has the chapter number in the top heading. Each chapter starts on a right-hand page (i.e. an odd-numbered page), so sometimes you will see blank pages on the left. Do not be alarmed, this is perfectly normal, and does not mean we were lost for words, or left to have a tea break.

Because of the way things are interrelated, you'll find some repetition in the different sections. This isn't because the editor had a bad day or short-term memory loss; it's to allow you take it from the top, or jump in wherever you're comfortable. You can expect to learn:

- The names and functions of the major building blocks of a mixer
- How to read and follow a block diagram
- Signal paths through the mixer
- Function of all the controls and some special features
- Hookups for various applications
- Mixing and operating tips

Much of what's written here applies to any mixer, even (dare we say it) one from another manufacturer, although not everything may apply to your particular mixer. Different applications call for different features, so you may not have every control, input, or output described here. If you're not familiar with mixing consoles, we suggest that you read through this book at your leisure, and keep it handy as a reference.

## Iconography and conventions



This icon marks information that is critically important or unique. For your own good, read these and remember them. They will be on the final test.



This icon leads you to in-depth explanations of features and practical tips. While not mandatory, they usually have some valuable nugget of information.

If you come across a label in the text written in capital letters, this is how a knob or control on the mixer is actually labeled. For example SOLO, TRIM or INITIATE LIGHT SPEED.

## Read This Page Please!

The Level Setting Procedure described below, is often fondly mentioned in the rest of this book. Please read it – you’ll be glad you did.

We’ll talk about gain structure a little farther on, but proper setting of input gain is very important to get the lowest noise and distortion when mixing. Keep this in mind and you won’t go astray.

### Level Setting Procedure

Message to seasoned pros: do NOT set levels using the old “Turn the trim up until the clip light comes on, then back off a hair” trick. When a Mackie Designs mixer clip light comes on, you really are about to clip.

This procedure really works - it assures low noise and high headroom. Proper level setting is important whether you’re mixing your band’s PA, tracking a recording, or doing a multitrack mixdown. Please read on.

It’s not necessary to hear what you’re doing to set optimal levels, but it helps you to understand what you’re adjusting. Plug a set of headphones into the PHONES output jack, then turn the PHONES level control about one-quarter of the way up.

Perform the following steps for each channel - one channel at a time:

1. Turn the TRIM, AUX send, and all fader controls fully down. This prevents listeners from hearing what you’re doing. It won’t be interesting.
2. Set the EQ knobs to their center (usually detented) position.
3. Connect the signal source to the MIC or LINE channel input.
4. Press the channel’s SOLO switch. Note: Some of our mixers have a SOLO MODE switch in the output section. If applicable, select the LEVEL SET (PFL) mode - the LEVEL SET LED will light.

Note: The PPM series Powered Mixers are the exception, since they don’t have a SOLO switch. Watch the INPUT LEVEL SET LED. When it blinks on peaks, that’s the equivalent of a 0 VU reading.

5. Play something into the selected input, at real-world (as loud as you’d expect it to be) levels.
6. Adjust the TRIM control so that the display on the meter stays around 0. (Only the left meter will be active.)
7. If you’d like to apply some EQ, do so now and return to the previous step to check the level again. **THIS IS VERY IMPORTANT!** Equalization can add several dB of boost to the channel signal, resulting in too high a level going into the mixer if you don’t trim it back down.
8. Disengage that channel’s SOLO switch.
9. Repeat for all of the other channels that you’re using in the mix.

And now on to our regularly scheduled program: