

# CONTENTS

INTRODUCTION .....	7
--------------------	---

## PART I: STUDIOLIVE MIXER OVERVIEW

<b>CHAPTER ONE—THE INPUT SECTION</b> .....	9
Mic/Line .....	10
Insert .....	11
Direct Out .....	11
48V (Phantom Power) .....	12
Channel Fader .....	13
Mute .....	14
Input Selection .....	14
Solo .....	14
Pan .....	15
Stereo Link .....	16
Assignments .....	16
Select .....	17
<b>CHAPTER TWO—THE FAT CHANNEL</b> .....	19
The Phase Switch .....	19
The High-Pass Filter .....	20
The Gate .....	20
On .....	22
Threshold .....	22
Range .....	22
Attack and Release .....	22
Key Filter and Key Listen .....	23
Exp .....	23
The Compressor .....	23
Threshold .....	24
Ratio .....	25
Attack and Release .....	25
Auto .....	26
On .....	26
Soft .....	26
Gain .....	26
The Limiter .....	27
On .....	28
Threshold .....	28
The Equalizer .....	28
Frequency .....	29
Q .....	29
Shelf .....	29
Gain .....	30
On .....	30
A/B .....	30
Digital Output .....	30
Channel Memory .....	31
Copy and Load .....	32
Save .....	32
Presets .....	32
<b>CHAPTER THREE—AUX AND FX BUSES</b> .....	33
Output .....	34
Control .....	35
Select .....	37
Solo .....	37
Post .....	38
Effects .....	39
Level .....	40
Select .....	40
Post .....	40
Mute .....	40
Mix .....	40

<b>CHAPTER FOUR—METERING</b>	41
The Fat Channel Meters	41
Input	42
Output	42
Gain Reduction	43
Aux	43
Fader Locate	44
The Main Meter Section	45
Selected Channel	45
Subs	46
Main	46
<b>CHAPTER FIVE—THE MASTER SECTION</b>	47
The Monitor Section	47
Monitor	47
Main	48
Tape	48
FireWire or D))	49
Solo	49
The Solo or Cue Section	50
SIP (Solo In Place)	50
PFL (Pre-Fader Listen)	50
Solo or CUE Level	51
Phones	51
2 Track In	52
Level Control	52
Tape	52
FireWire or D)) Button	52
The Talkback System	52
Talkback Mic	53
Talkback Routing	53
Talkback Button	53
Aux Inputs	54
Subgroups	54
Mute Groups	55
All On	55
All Off	56
Mute Groups 1–6	56
Master Fader	56
<b>CHAPTER SIX—MASTER CONTROL</b>	57
Navigation	57
Value	57
Previous and Next	57
Page Up and Page Down	57
FX	58
Scene	58
Store	58
Recall	58
System	58
Digital Effects	58
Reverb	58
Delay	61
Setting Up the Effects	62
Graphic EQs	62
Assignment	63
Navigation	64
Storing and Recalling Settings	64
Using the Graphic EQ	64
System Menu Control Functions	64
Page 1: Global	65
Page 2: Network	66
Page 3: iOS Setup	66
Page 4: Aux Pre Position	66
Page 5: FX Pre Position	67
Page 6: Digital Info	67
Page 7: Sub Out Delay	69
Page 8: Lockout Mode	70
Page 9: System About	70

<b>CHAPTER SEVEN—UNIQUE FEATURES</b>	71
Virtual StudioLive	71
Sample Rate	72
Clock Source	72
Operation Mode: Buffer Size	73
Remote Control via VSL	74
Manage Presets	75
Lockout	77
Wireless Control via SL Remote	77
Smaart Integration	77
The Spectrograph	77
The Real-Time Analyzer (RTA)	81
Output Check	83
Smaart Room Analysis Wizard	83
QMix/QMix-AI iPhone Remote Control of Cue Mixes	84
Recording Software	85
Capture 2	85
Studio One	85

## PART 2: USING STUDIOLIVE FOR LIVE SOUND

<b>CHAPTER EIGHT—TUNING THE SOUND SYSTEM TO THE ROOM</b>	87
Why Each Venue Sounds Different	87
The Size	87
The Shape	89
The Building Materials Used	90
The Fixtures	90
The Audience	90
EQing the Room	91
Using Smaart to Analyze and Correct a Live Venue	91
A Word About Room EQ Curves	94
Suppressing Feedback	95
Ringing Out the System	95
Using Smaart to Suppress Feedback	96
GEQ Draw Mode	98
Storing and Recalling a Setup	98
Storing a Setup	98
Recalling a Scene	100
<b>CHAPTER NINE—STAGE MONITOR MIXES</b>	101
Analyzing and Correcting the Floor Monitors	102
Suppressing Feedback	102
Ringing Out the System	102
Using Smaart to Suppress Feedback	102
Setting Up Multiple Monitor Mixes	104
QMix iPhone Remote Control of Monitor Mixes	104
Setting Up Wireless Control	105
Connecting Your Computer to the Network (AI Series Consoles)	106
Connecting Your iPhone to the Network	107
The Different Views	107
QMix Options	108
Permissions	109
<b>CHAPTER TEN—LIVE MIXING WITH STUDIOLIVE</b>	111
Stage Setup	111
Line Check	112
Gain Staging	113
Bad Gain Staging Examples	113
Channel and Subgroup Gain Staging	114
Setting the Levels	115
Adding More Instruments	116
Using the Dynamics	116
Setting Up the Gate	116
Setting the Compressor	117
Using the Limiter	118
Using the EQ	118

Using the High-Pass Filter .....	119
Using the Equalizer.....	119
Creating a Balance .....	122
Dealing with Loud Amplifiers .....	123
Mixing Up to the Stage Volume .....	123
Mixing with Subgroups .....	123
Mixing in Stereo .....	124
Using Effects .....	125
Two-Delay Setup .....	125
Reverb and Delay Setup.....	125
Two-Reverb Setup.....	125
Two-Delay Two-Reverb Setup (AI Series Only) .....	125
Storing Presets and Scenes .....	126
<b>CHAPTER ELEVEN—CONTROLLING STUDIOLIVE REMOTELY .....</b>	<b>127</b>
Setting Up Wireless Control.....	127
On a Mac Running OS X 10.6 to 10.8 .....	127
On a PC Running Windows 7 .....	128
Connecting Your iPad to the Network .....	128
Using SL Remote .....	129
The Start Page.....	129
The Different Views .....	130
Scenarios for Remote Control .....	134
<b>CHAPTER TWELVE—ADDITIONAL FEATURES .....</b>	<b>135</b>
Console Linking.....	135
Lockout Mode.....	137
Output Check.....	139
System Delay .....	140
<b>CHAPTER THIRTEEN—RECORDING YOUR PERFORMANCE .....</b>	<b>143</b>
Recording with Capture 2.....	143
Using Capture 2.....	143
Virtual Soundcheck .....	144
Session Lock.....	145
File Management .....	146
Big Meter Mode .....	147
Markers.....	148
Using an Outboard Recorder.....	149
Setting the Record Level.....	151
Two-Track Recording.....	151
 <b>PART 3: USING STUDIOLIVE IN THE STUDIO</b>	
<b>CHAPTER FOURTEEN—TREATING YOUR ROOM ACOUSTICS .....</b>	<b>153</b>
Acoustic Quick Fixes.....	153
Tuning Your Speakers to the Room.....	158
The Type of Curve to Look For.....	160
<b>CHAPTER FIFTEEN—MIC PLACEMENT .....</b>	<b>161</b>
Basic Miking Technique.....	161
Step 1: Choose the Best Place in the Room .....	161
Step 2: Choose the Right Mic .....	162
Step 3: Choose the Mic Placement .....	163
Step 4: Avoid Phase Cancellation .....	165
Basic Mic Placement .....	166
The Secret to Good Sounds .....	167
The Drum Kit .....	167
Bass Guitar .....	172
Electric Guitar.....	173
Acoustic Guitar .....	174
Electric Keyboards.....	174
Acoustic Grand Piano.....	174
Acoustic Upright Piano .....	175
Hand Percussion .....	176
Drum Percussion .....	176
Individual String Instruments .....	177
String Ensembles.....	177
Brass.....	178

Saxophone .....	179
Lead Vocals.....	179
Background Vocals.....	180
Stereo Miking Techniques .....	180
X/Y .....	180
ORTF .....	181
Spaced Pair.....	181
Stereo Mic.....	182
<b>CHAPTER SIXTEEN—RECORDING WITH STUDIOOLIVE</b> .....	183
Setting Record Levels.....	183
Headroom.....	184
How to Set the Recording Level.....	185
Recording with or without Signal Processing .....	186
Setting the Recording Level with Signal Processing.....	187
DI Setup.....	187
Saving Your Settings .....	188
If Something Is Noisy or Distorting.....	188
Cue Mixes .....	189
Setting Up a Cue Mix.....	189
The Players Control Their Own Cue Mixes with QMix .....	192
Studio One.....	195
Versions .....	196
Uploading to Soundcloud .....	196
Uploading to Nimbit .....	196
<b>CHAPTER SEVENTEEN—STUDIO MIXING WITH STUDIOOLIVE</b> .....	197
The Difference between Live and Studio Mixing.....	197
How Long Should a Mix Take? .....	198
Configuring StudioLive for Mixing.....	199
Setting Up Solo In Place.....	199
Building the Mix.....	200
Creating a Balance .....	200
The Rhythm Section.....	200
The Lead Element.....	203
The Rest of the Mix.....	204
Panning.....	204
Panning the Drums.....	204
Stereo Instruments.....	205
Background Vocals.....	205
Using the Equalizer .....	206
Frequency Areas to Look At.....	206
The Principles of Equalization.....	207
Using the Dynamics .....	207
Using the Gate .....	207
Using the Compressor .....	208
Using the Limiter.....	210
Using Effects .....	210
Recalling FX Presets.....	210
Using Reverb.....	211
Using Delay.....	212
Add an Artificial Double .....	212
EQing Effects.....	213
Storing Presets .....	213
Watch the Meters.....	214
Storing and Recalling Scenes.....	214
<b>CHAPTER EIGHTEEN—NIMBIT</b> .....	215
Nimbit Features.....	215
Free Plan .....	216
Plus Plan.....	216
Premium Plan .....	217
Accessing Nimbit.....	217
Uploading a Song to Nimbit .....	218
<b>INDEX</b> .....	220

# INTRODUCTION

You're probably wondering why *The PreSonus StudioLive Handbook* book came about when there's a perfectly good manual for the PreSonus StudioLive console already.

StudioLive's manual is indeed well-written and contains a lot of details about the console, some which will also be covered here and some not, but I never intended for this book to be just a rehash of the manual.

The real reason why I wrote this book is because so few StudioLive owners actually use this excellent console to anywhere near its full potential. In fact, the typical user only scratches the surface of what it can do, which is a shame because if you do tap into its power, it can help make your gigs and recordings sound so much better, as well as solve a number of typical user problems along the way. My goal is to show you scenarios where these features can be helpful in the hopes that you'll give them a try.

This is also a book about "why." Many users, especially those new to mixing, aren't sure why many of StudioLive's features and controls are included or what they may be used for. The *StudioLive Handbook* is intended to give you some background regarding the real-world situation that caused each feature to be created. Every parameter is on the console for a good reason, and if you understand the problem it solves, it makes it a lot easier to apply them to your own mixing situation.

Like many of my other books, *The PreSonus StudioLive Handbook* is divided into three parts:

- **Part 1** is a general overview of StudioLive, with an in-depth look at all the controls, parameters, and functions as well as an explanation of why they're included and the situations where they're normally used.
- **Part 2** is about using StudioLive specifically in the live sound environment, with a look at how the console can solve some typical problems in situations where you'll most likely be using it.
- **Part 3** is about using StudioLive in the studio, with a look at recording, miking, and mixing techniques used by top pros that go beyond what's found in a typical owner's manual.

StudioLive is an amazing achievement in that it packs so much bang for the buck in terms of features, although many are never even touched by some users. It's also highly flexible and updatable, things that many other consoles in the price range can't claim, and its feature set blooms when connected to a computer.

As PreSonus vice-president of sales Rick Naqvi says, "The worst that your StudioLive will ever be is on the day that you buy it!" That's a bold statement, but I hope to show how it's absolutely true. Let's dig into the features that StudioLive can contribute to make your live sound and recordings sound better than ever before.

## Stereo Link

Many stereo instruments or vocals are easier to control during a mix if their channels are linked together, which is what the Stereo Link button does. This allows you to change the EQ, compression, or effects on both channels simultaneously from just a single channel, so the adjustments are faster and more precise.

To engage the stereo link function, select two channels and then the Stereo Link button (see Figure 1.12). The only caveat is that they have to be adjoining odd and even channels, such as 1–2, 5–6, or 21–22, to successfully link together.



FIGURE 1.12: THE STEREO LINK BUTTON.

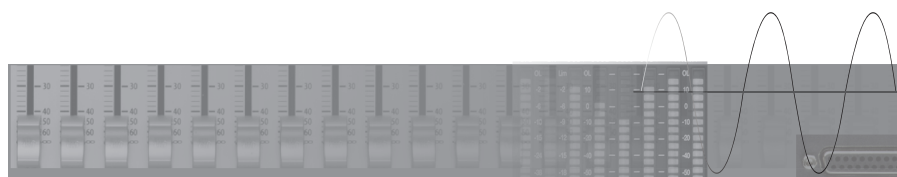
## Assignments

The Assignment section allows you to assign the channel to either the main console outputs or any of the four subgroups (see Figure 1.13). Large groups of faders (12 drum channels, for instance) can be impossible to move all at the same time even with two hands, so subgroups were created to make that operation easier. That means you can assign a number of channels (such as the drums) to a single subgroup fader and a number other similar channels (such as vocals) to another subgroup fader so you don't need four hands on the console to do a mix.



FIGURE 1.13: THE ASSIGNMENT SECTION.





## METERING

Metering is important in any piece of audio gear, but especially so in anything digital. That's because a signal that exceeds 0dB on the meter usually results in distortion that often sounds worse than when it happens in its analog counterpart. That's why we have to take metering seriously, and StudioLive does, with the ability to visually monitor far more than it initially appears to. This chapter provides an overview of the various meters on the console and their functions.

### The Fat Channel Meters

The Fat Channel meters are actually multipurpose in that they can display much more than the individual functions of the Fat Channel. With the buttons located below the Digital Effects | Master Control (see Figure 4.1), the meters can be switched to look at input, output, gain reduction, auxes, and fader position, as discussed in the following sections.

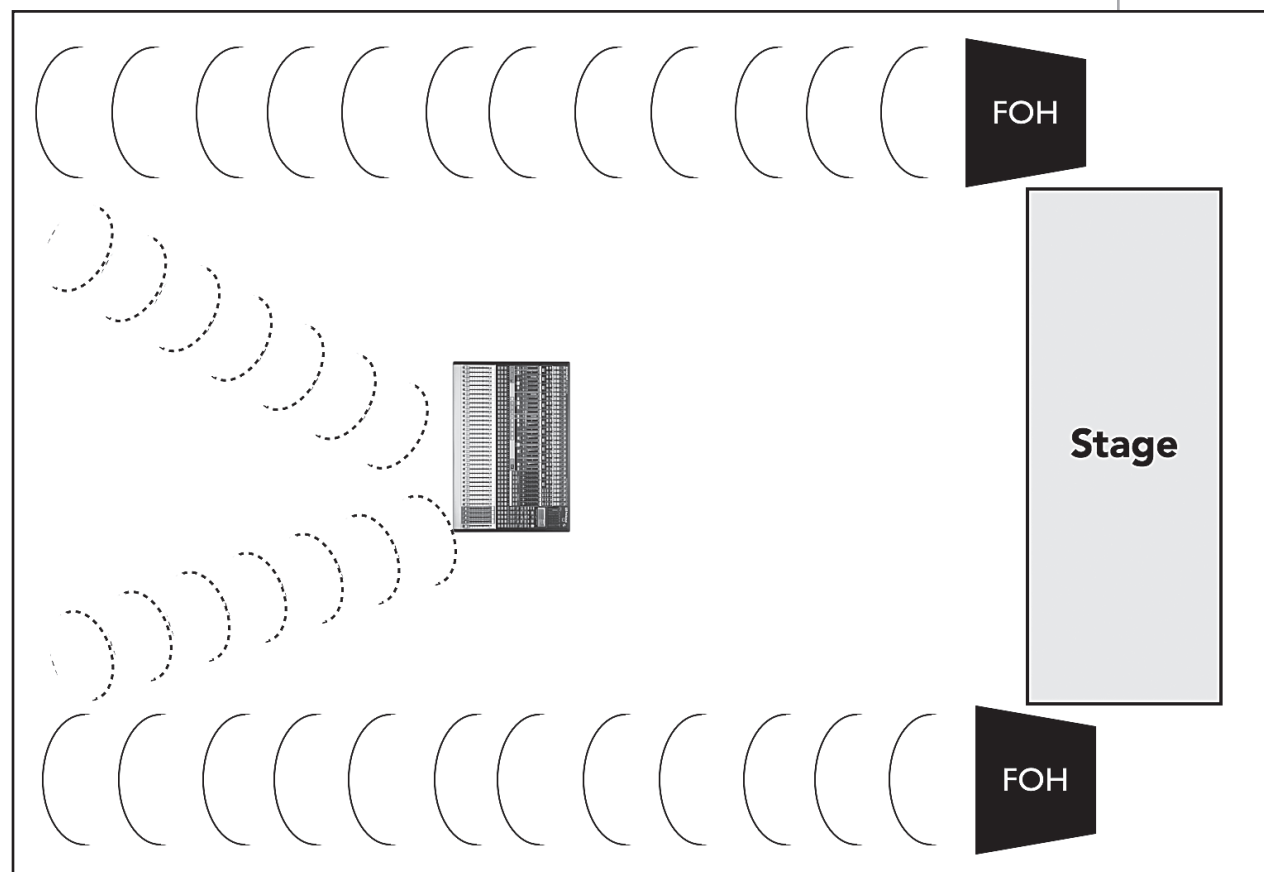


FIGURE 4.1: THE METER SWITCHES.



## THE SHAPE

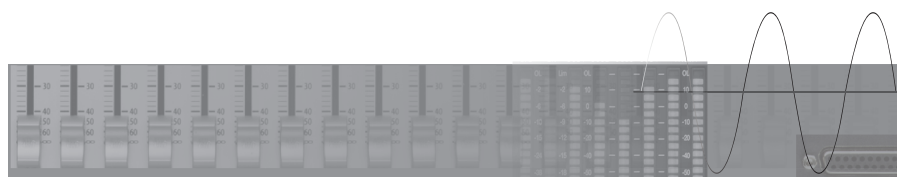
The shape of the room is one of the major factors in the way it sounds. The best shape is a rectangle, as long as the stage is facing lengthwise (see Figure 8.4). That's because the room reflections are generally more pleasing with less cancellation and reinforcement as they bounce around (without getting into a long technical explanation on acoustics). The worst shape is a square—or even worse than that, a cube, where all the dimensions are the same. This means that in spots in the room some low frequencies will be overwhelming, while they'll be nonexistent in other places.



**FIGURE 8.4: A RECTANGULAR ROOM.**

Speaking of a cube shape, the height of the ceiling makes a big difference, because some of the sound can go up and entertain the spiders rather than your audience in a room with a high ceiling. A very low 10- or 12-foot ceiling tends to make the room sound very loud, because the sound is easily reflected off it back onto the audience. A 30-foot or higher ceiling starts to sound cavernous, but in between can be a nice compromise.

Have you ever noticed how most bars, clubs, and even churches have the weirdest shape and have the stage in the worst place? That's because most are built with other things than the band in mind. In fact, the band and the stage placement are sometimes the last things they consider.



## LIVE MIXING WITH STUDIO LIVE

After the speaker system is tuned to the venue, we can get down to the business of mixing. In this chapter we'll look at the sequence of events that happens in mixing a live show and how StudioLive can make some of them go much faster.

### Stage Setup

A working band plays a lot of venues, and that means its members are faced with a different stage every gig. On some gigs there's a comfortable amount of space, while others feel cramped, and every once in a while there's so much room that the band is unsure how to use it all. Regardless of the venue, here are a few tips that will help the sound stay consistent:

1. **Always set up the same way.** It's easier to EQ things and account for any leakage if the players and gear are always set in the same place on stage. It's also better for the players because they have consistent audio and visual cues from gig to gig.
2. **Set the speakers in front of the band if possible.** This keeps the interaction with open mics to a minimum and minimizes any phase cancellation with the floor monitors. The only exception where you might push the speakers back a little would be if the monitors are inadequate and the band can't hear enough of the main mix, but remember that the risk of feedback is increased when this happens (see Figure 10.1).

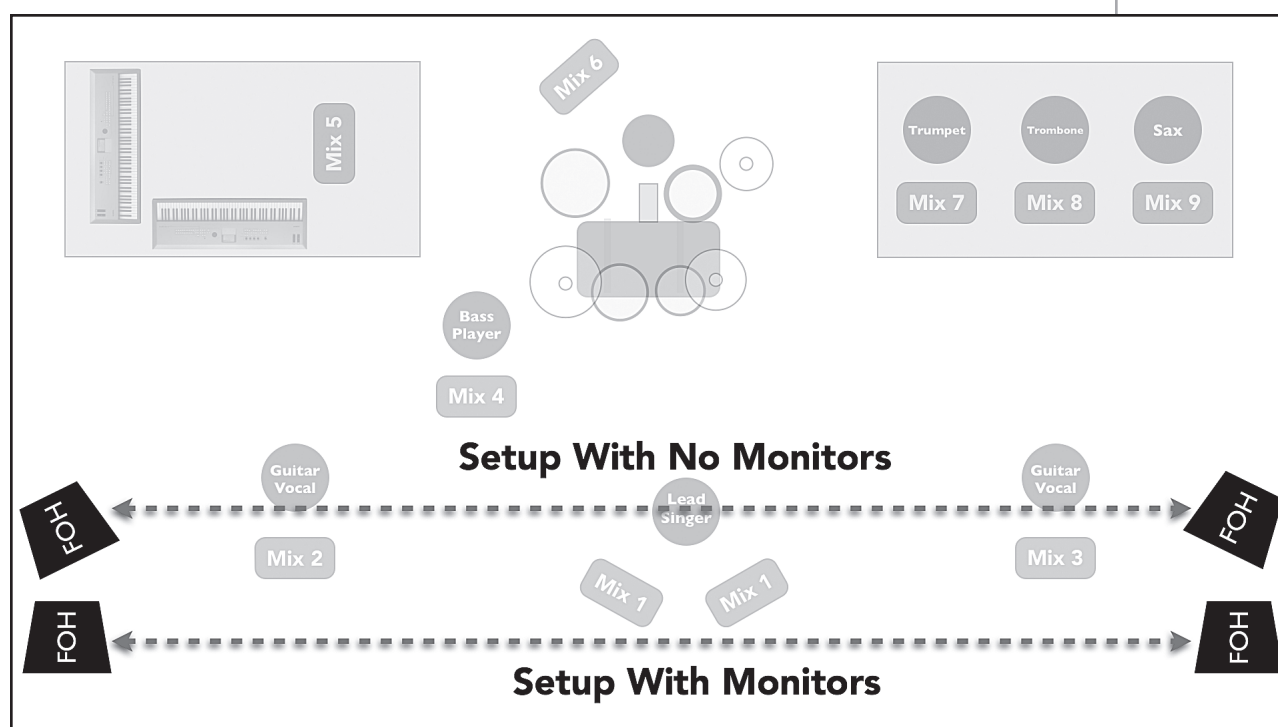


FIGURE 10.1: SPEAKER SETUP.

### ACOUSTIC GUITAR

Place a mic about 6 inches away from where the neck meets the guitar body (see Figure 15.14).

**What to listen for:** A balance in tone of the instrument.

**How to get it:** Move the mic closer to the sound hole for more body and less definition. Move the mic back for more of the room or a more even tonal balance.



FIGURE 15.14: TYPICAL ACOUSTIC GUITAR MIC PLACEMENT.

### ELECTRIC KEYBOARDS

Connect the keyboard outputs to either a single direct box for mono or two for stereo. Select the position of the ground switch that provides the lowest noise. Also try using the line inputs of the channels on StudioLive. Start with the Mic/Line control set to  $-20$  and raise it until you find the appropriate level.

---

#### TIP

When recording in mono, either use the keyboard output labeled Mono or select a mono preset, if available.

---

### ACOUSTIC GRAND PIANO

If using only a single mic, place it about 6 inches above where the high and low strings cross. If miking in stereo (or just to get a better balance between the instrument's highs and lows), place one mic about 6 inches over the center of the high strings and another about 6 inches over the center of the low strings (see Figure 15.15).

**What to listen for:** A balance between the high and low strings.

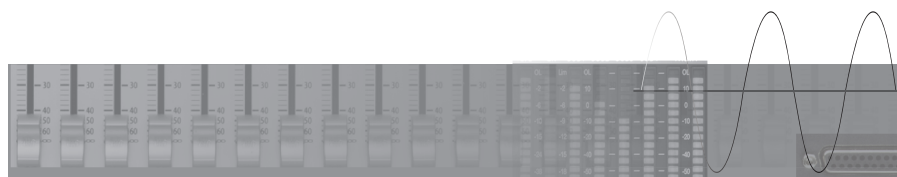
**How to get it:** Move the mics lower for a brighter sound with less leakage but less balance between registers. Move the mics higher for a better balance but less definition and more potential leakage. Move the mics left and right over the strings to adjust the balance in the range.

---

#### TIP

A stereo pair above where the high and low strings cross can be a good alternative. (See the "Stereo Miking Techniques" section later in the chapter.)

---



## RECORDING WITH STUDIO LIVE

This chapter is about recording fundamentals that apply to any recording situation, not just when using StudioLive. That said, we'll look at some specific functions of StudioLive as we go along.

### Setting Record Levels

Over the years, some misconceptions about meter level readings have arisen and have left many confused about just what the correct level should be, so let's bust a couple of myths.

**Myth #1:** You have to record at close to 0dBFS for it to sound good. For the most part, you do not have to record with the level close to 0dB (the highest it will go before the red Overload indicator lights) on today's digital gear. If your signal peaks are between -6 and -10dB or even lower on the channel meter, it will sound fine (see Figure 16.1). In the early days of digital recording, a meter reading close to 0dB actually was necessary to keep the noise to a minimum because of the 8- and 16-bit resolution that was being used, but modern 24-bit recording no longer has this limitation.

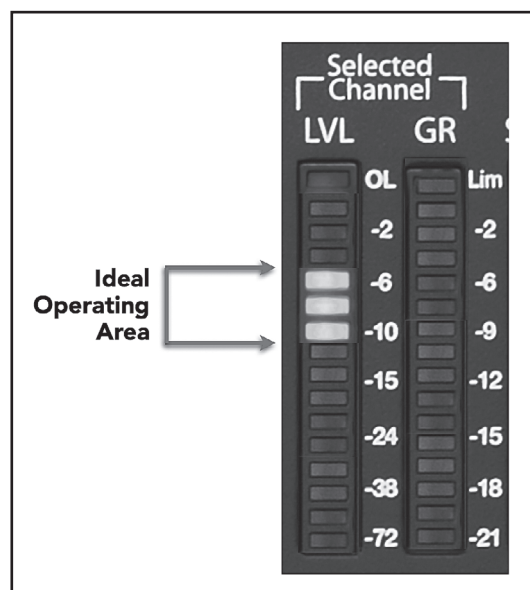
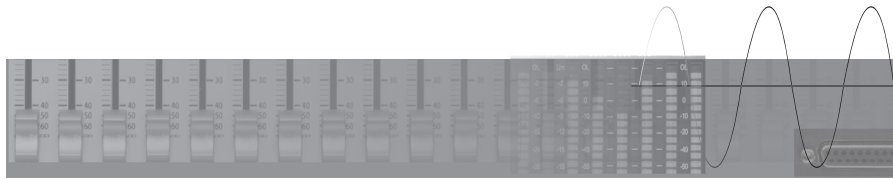


FIGURE 16.1: A SAFE DIGITAL RECORDING LEVEL.

**Myth #2:** If I record at a lower level, the signal will be noisy. Again, this is untrue. You can easily record digitally at a lower level without directly introducing any noise into the recorded signal by the recording process. This myth actually comes from the analog tape days, where the magnetic tape medium itself had a level of self-noise in it. If you recorded too low, you'd begin to hear the tape noise, but that doesn't happen in the digital world.

Now, what *can* happen is that if everything you record is at -30dB, you'll have to increase the gain somewhere later when you're mixing; that may introduce some noise, and you won't be taking advantage of the digital medium's dynamic range. Because StudioLive is a digital mixer, you can actually almost get away with doing this, which isn't possible in the analog world. Still, if you



## STUDIO MIXING WITH STUDIO LIVE

Today's studio mixing has become a marriage of console and DAW, with every engineer using the features of each to a varying degree. Many would prefer to do much of the mix work mostly in the box (meaning within the DAW), while others are more comfortable using the features of a console to perfect the mix. The techniques in this chapter are somewhat generic, as they apply to either, although we'll mostly use StudioLive for any examples. Also, many techniques that we'll talk about can apply to live mixing as well.

Unfortunately, we can only briefly touch upon the many aspects of mixing in a single chapter. For more in-depth info, refer to *The Mixing Engineer's Handbook* (Cengage Learning PTR, 2013), *Audio Mixing Boot Camp* (Alfred Music, 2012), or the Audio Mixing Bootcamp video series on Lynda.com.

Remember, everything in this chapter is a starting point only. Because each song, arrangement, performance, and mix is different, you'll have to tweak the settings to work with your own particular situation. The examples will help get you in the ballpark, but the rest is up to your ears.

### The Difference between Live and Studio Mixing

You might think that mixing is the same whether you do it live or in the studio, and to some degree that's true, but there are differences.

For one thing, the studio is more about precision. When you're mixing live, the song is gone as soon as it's played. You have to wait until the next gig to try to refine its mix, but everything could sound different because it'll probably be in a different environment with different acoustics and conditions. In the studio, the song is replayed over and over again as every aspect of the mix is refined, from the balance to the panning to the compression to the effects. It's easier to do this because you're always listening in an environment that doesn't change from mix to mix.

The second thing is that it's up to the engineer to make a studio mix interesting. During a live gig, the mix could be less than stellar, yet the audience won't notice because of the energy of the band onstage. (This happens all the time in venues large and small.) In the studio, the engineer has to make the mix interesting by virtue of the way the mix is crafted. It has to be able to pull people in and not only make them want to listen, but also make them want to keep listening until the song is over. You could have the best-recorded and -played performances in the world, but it can all sound flat with a mediocre mix. That's why it's not uncommon to spend weeks on a mix. In the past, it was more common than you'd think to do dozens of mixes of the song, or even spend a couple of months getting a mix to the point where the production team felt it was worthy of release. Great studio mixes don't always come easily.