

# The Recording Engineer's Handbook

THIRD EDITION

Bobby Owsinski

Cengage Learning PTR



Professional • Technical • Reference

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**The Recording Engineer's Handbook,  
Third Edition  
Bobby Owsinski**

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Library of Congress Control Number: 2013942733

ISBN-13: 978-1-285-44201-3

ISBN-10: 1-285-44201-6

**Cengage Learning PTR**

20 Channel Center Street

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# About the Author

A longtime music-industry veteran, **Bobby Owsinski** started his career as a guitar and keyboard player, songwriter, and arranger, eventually becoming an in-demand producer/engineer working not only with a variety of recording artists, but also on commercials, television, and motion pictures. One of the first to delve into surround sound music mixing, Bobby has worked on more than 100 surround projects and DVD productions for a variety of superstar acts.

Combining his music and recording experience with an easy-to-understand writing style, Bobby has become one of the bestselling authors in the music recording industry, with 19 books that are now staples in audio recording, music, and music business programs in colleges around the world, including the bestselling *The Mixing Engineer's Handbook*, *The Recording Engineer's Handbook*, *How to Make Your Band Sound Great*, and *Music 3.0: A Survival Guide for Making Music in the Internet Age*. Many of his books have also been turned into video courses that can be found online at [lynda.com](http://lynda.com), and he continues to provide presentations, workshops, and master classes at conferences and universities worldwide.

Visit Bobby's production blog at [bobbyowsinski.blogspot.com](http://bobbyowsinski.blogspot.com), his Music 3.0 blog at [music3point0.blogspot.com](http://music3point0.blogspot.com), and his website at [bobbyowsinski.com](http://bobbyowsinski.com).

## Bibliography

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*The Mixing Engineer's Handbook* (Cengage Learning): The premier book on audio mixing techniques provides all the information you need to take your mixing skills to the next level, along with advice from the world's best mixing engineers.

*The Audio Mastering Handbook* (Cengage Learning): Everything you always wanted to know about mastering, from doing it yourself to using a major facility, utilizing insights from the world's top mastering engineers.

*The Drum Recording Handbook* [with Dennis Moody] (Hal Leonard): Uncovers the secret of making amazing drum recordings in your own recording studio even with inexpensive gear. It's all in the technique, and this book/DVD will show you how.

*How to Make Your Band Sound Great* (Hal Leonard): This band-improvement book and DVD shows your band how to play to its fullest potential. It doesn't matter what kind of music you play, what your skill level is, or whether you play covers or your own music, this book will make you tight, it will make you more dynamic, it will improve your show, and it will improve your recordings.

*The Studio Musician's Handbook* [with Paul ILL] (Hal Leonard): Everything you wanted to know about the world of the studio musician, including how to become a studio musician, who hires you, how much you get paid, what kind of skills you need, what gear you must have, the proper session etiquette required to make a session run smoothly, and how to apply these skills in every type of recording session, regardless of whether it's in your home studio or at Abbey Road.

## The Recording Engineer's Handbook

*Music 3.0: A Survival Guide to Making Music in the Internet Age* (Hal Leonard): The paradigm has shifted, and everything you knew about the music business has completely changed. *Music 3.0* provides a strategy for how to navigate the new music business.

*The Music Producer's Handbook* (Hal Leonard): This book and DVD reveal the inside information and secrets to becoming a music producer and producing just about any kind of project in any genre of music. The book also covers the true mechanics of production, from analyzing and fixing the format of a song, to troubleshooting a song when it just doesn't sound right, to getting the best performance and sound out of the band and vocalist.

*The Musician's Video Handbook* (Hal Leonard): This book and DVD describe how the average musician can easily make any of the various types of videos now required by a musical artist either for promotion or for a final product. But just shooting a video isn't enough. The book will also demonstrate the tricks and tips used by the pros to make the video look professionally done, even with inexpensive gear and not much of a budget.

*Mixing and Mastering with IK Multimedia T-RackS: The Official Guide* (Cengage Learning): T-RackS is a popular stand-alone audio mastering application that includes a suite of powerful analog-modeled and digital dynamics and EQ processor modules that also work perfectly as plug-ins during mixing. With *Mixing and Mastering with IK Multimedia T-RackS: The Official Guide*, you can harness the potential of T-RackS and learn the tips and tricks of using T-RackS processor modules to help bring your mixes to life, then master them so they're competitive with any major-label release.

*The Touring Musician's Handbook* (Hal Leonard): Touring is what every musician dreams about from the first time he or she picks up an instrument. But what do you do when you finally get that chance? How do you audition? What kind of chops do you need? What equipment should you bring? How do you prepare for life on the road? Regardless of whether you're a sideman, a solo performer, or a member of a band, all of these questions are answered in *The Touring Musician's Handbook* and DVD. As a bonus, it includes individual touring musician guides for guitar, bass, drums, vocals, keys, horns, and strings, as well as interviews with famous and influential touring players.

*The Ultimate Guitar Tone Handbook* [with Rich Tozoli] (Alfred Publishing): The definitive book for discovering that great guitar sound and making sure it records well. The book outlines all the factors that make electric and acoustic guitars, amplifiers, and speaker cabinets sound the way they do, as well as the classic and modern recording and production techniques that capture great tone. *The Ultimate Guitar Tone Handbook* also features a series of interviews with expert players, technicians, recording engineers, producers, and manufacturers that gives you an inside look into the business of guitar tone. An accompanying DVD provides both an audio and a visual reference point for achieving the classic sounds you hear on records.

*The Studio Builder's Handbook* [with Dennis Moody] (Alfred Publishing): No matter how good your recording gear is, chances are you're not getting the best possible sound because of the deficiencies of your room. While you might think that it costs thousands of dollars and you need the services of an acoustic designer to improve your studio, *The Studio Builder's Handbook* and DVD will strip away the mystery of what makes a great-sounding studio and show you how you can make a huge difference in your room for as little as \$150.

*Abbey Road to Ziggy Stardust* [with Ken Scott] (Alfred Publishing): The memoir of legendary producer/engineer Ken Scott, who holds a unique place in music history as one of only five engineers to have recorded the Beatles, and producer and/or engineer on six David Bowie records, among many others. Funny, poignant, and oh so honest, Ken pulls no punches as he tells it as he saw it, as corroborated by a host of famous and not-so-famous guests who were there as well. Plus, you'll be privy to several exclusive stories, facts, technical details, and never-before-seen photographs available only in *Abbey Road to Ziggy Stardust*.

*The Audio Mixing Boot Camp* (Alfred Publishing): If you're creating your first mix and don't know where to begin, or your mixes aren't as good as you'd like them to be, *The Audio Mixing Boot Camp* and DVD are here to help. Built around a series of hands-on mixing exercises designed to show you how to listen and work like a pro, the book reveals the tips, tricks, and secrets to all the different facets of mixing, including instrument and vocal balance, panning, compression, EQ, reverb, delay, and making your mix as interesting as possible.

*Audio Recording Basic Training* (Alfred Publishing): If you're new to recording and don't know where to start, or your recordings aren't as good as you'd like them to be, *Audio Recording Basic Training* and the included DVD are a great place to begin. Built around a series of hands-on recording exercises designed to show you how to listen and work like a recording pro, the book reveals the tips, tricks, and secrets to all the different facets of recording—including miking a drum kit, recording vocals, and miking just about any kind of electric or acoustic instrument.

You can get more info and read excerpts from each book by visiting the excerpts section of [bobbyowsinski.com](http://bobbyowsinski.com).

## Bobby Owsinski Lynda.com Video Courses

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The Audio Mixing Boot Camp Video Course: More than eight hours of movies outlining the various steps, tips, and tricks of mixing like the pros.

Audio Recording Techniques: Discover the industry secrets to recording crisp, rich vocal and instrument tracks, as renowned audio engineer Bobby Owsinski walks through the process of miking and tracking a complete song using A-list session musicians in a top-of-the-line studio.

Mastering for iTunes: Best practices for mastering music and audio destined for sale on Apple iTunes with their new Mastered for iTunes high-resolution audio program.

## Also Available from Bobby Owsinski

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Delay Genie iPhone App: Time your delays and reverbs to the track with this easy-to-use app. Also has a live mode for delaying speakers or delay towers. And it's FREE!

## Bobby Owsinski's Social Media Connections

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Bobby's Music Production Blog: [bobbyowsinski.blogspot.com](http://bobbyowsinski.blogspot.com)

Bobby's Music Industry Blog: [music3point0.blogspot.com](http://music3point0.blogspot.com)

Bobby on Facebook: [facebook.com/bobby.owsinski](https://facebook.com/bobby.owsinski)

Bobby on YouTube: [youtube.com/polymedia](https://youtube.com/polymedia)

Bobby on LinkedIn: [linkedin.com/in/bobbyo](https://linkedin.com/in/bobbyo)

Bobby on Twitter: [@bobbyowsinski](https://twitter.com/bobbyowsinski)

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# Introduction

When the first edition of this book was written back in 2002, the recording world was a different place. There were still quite a few real commercial studios available to record in, the old studio structure of master and apprentice engineer was still in place, and record labels were still where you wanted to be if you were an artist. Boy, everything has really changed since then. Now virtually anyone can have a pretty good-sounding personal studio without spending a lot of money, record labels have lost much of their power, and since there aren't a lot of commercial studios around anymore, there are not many pro engineers to pass on the tricks of the trade. That's what makes this book all the more useful.

The idea behind my books is to preserve the techniques of the recording masters for history and pass those techniques on to you, the reader. That might not be as hands-on or efficient as the master/apprentice (engineer and assistant) system used in large studio facilities for 50 years, but at least there's somewhere to refer to if you don't know how to record an instrument and there's no one around to ask.

In this new era of samples, loops, and modeling, a whole generation of engineers has grown up with little working knowledge of microphone technique, and that's understandable when you can make great recordings without ever having to do much tracking in the first place. The problem is that sooner or later, there'll be a time when a question like "What's the best way to mike the snare to really make it punchy?" or "How do I get a big guitar sound like *[name your favorite artist]* gets?" or "How do you mike a piccolo?" can cause a mild panic. That's where this book comes in.

While there are many books available that touch upon the basics of recording (especially stereo orchestral material), there aren't many books that feature multiple techniques in miking a wide variety of instruments in the detail needed to achieve reasonable and consistent results. And there is no book that concentrates upon this basic, yet all-important facet of recording in quite the same way as it's presented here.

As you'll see, there are many ways to get the same basic result. There's no right way to mike an instrument, but some ways are more accepted than others and therefore become a standard. Whenever possible, I've tried to provide a high-resolution photo or diagram of a described miking technique, as well as a written description of the theory behind it, as well as the possible variables.

Those of you who have read my previous books will notice that the format for this book is identical to those. It's divided into two sections:

- ▷ Part I takes a look at the microphone basics, the classic models frequently used, and the techniques used by the best tracking engineers in the business.
- ▷ Part II is made up of interviews with some of the finest (and in some cases legendary) tracking engineers in the world.

Keep in mind that whenever possible, I tried not to get too specific on the make and model of microphone to use. That's because you probably don't have access to some of the expensive vintage mics that are frequently specified in the various setups, but the fact of the matter is that the placement counts more than the mic, so feel free to use whatever mics you have.



# Meet the Engineers

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Here's a list of the engineers who contributed to this book, along with some of their credits. You'll find that there are some industry legends as well as others that specialize in all different genres of music.

**Chuck Ainlay** is one of the new breed of Nashville engineers that brings a rock-and-roll approach to country music sensibility. With credits such as George Strait, Dixie Chicks, Vince Gill, Patty Loveless, Wynonna, and even rock icons such as Dire Straits and Mark Knopfler, Chuck's work is heard worldwide.

**Steve Albini** gained his considerable experience and reputation working primarily with underground and alternative bands. While his most famous credit remains Nirvana's *In Utero*, Steve has worked with a diverse lineup of artists such as PJ Harvey, the Pixies, the Stooges, Cheap Trick, Silkworm, Jesus Lizard, Bush, and even the mainstream Jimmy Page/Robert Plant *Walking to Clarksdale*.

**Michael Bishop** was formerly the chief engineer for the audiophile label Telarc. He mostly utilizes the old-school method of mixing live on the fly, always with spectacular results.

**Bruce Botnick** has a perspective on recording that few engineers have. After starting his career in the thick of the Los Angeles rock scene recording hits for the Doors, the Beach Boys, Buffalo Springfield, the Turtles, and Marvin Gaye, Bruce became one of the most in-demand movie soundtrack recordists and mixers, with blockbuster credits such as *Star Trek*, *Poltergeist*, *Air Force One*, *Aladdin*, *Mulan*, *ET*, and many more.

**Ed Cherney** is one of the most versatile and talented engineers of our time. He has recorded and mixed projects for the Rolling Stones, Iggy Pop, Bob Dylan, Michael Jackson, Elton John, Bob Seger, Roy Orbison, and John Mayer, as well as many others. Ed has also recorded and mixed the multiple Grammy-winning *Nick of Time* and *Luck of the Draw* CDs for Bonnie Raitt, as well as engineered the Grammy-winning "Tears in Heaven" track for the Eric Clapton-scored film, *Rush*.

**Wyn Davis** is best known for his work with hard-rock bands such as Dio, Dokken, and Great White. From his Total Access studios in Redondo Beach, California, Wyn's work typifies old-school engineering coupled with the best of modern techniques.

**Frank Filipetti** has recorded everyone from Celine Dion, Carly Simon, James Taylor, Tony Bennett, and Elton John to Kiss, Korn, Fuel, Foreigner, Hole, and many more. Known for his fearless ability to either extensively experiment or get instant sounds as the session dictates, Frank's old-school wisdom combined with his adventuresome and modern approach continues to push the cutting edge.

**Eddie Kramer** is unquestionably one of the most renowned and well-respected producer/engineers in all of rock history. His credits include rock icons such as Jimi Hendrix, the Beatles, the Rolling Stones, Led Zeppelin, Kiss, Traffic, and the Kinks, pop stars Sammy Davis Jr. and Petula Clark, and the seminal rock movie *Woodstock*.

**Mark Linett** is a Sunset Sound alumnus who went on to a staff position at the famous Warner Bros.-owned Amigo Studios before subsequently putting a studio in his house. You've heard his work many times, with engineering credits for the likes of the Beach Boys, Brian Wilson, America, Rickie Lee Jones, Eric Clapton, Christopher Cross, Buckwheat Zydeco, Randy Newman, Michael McDonald, and many more.

**Mack** has a Who's Who list of credits such as Queen, Led Zeppelin, Deep Purple, the Rolling Stones, Black Sabbath, Electric Light Orchestra, Rory Gallagher, Sparks, Giorgio Moroder, Donna Summer, Billy Squire, and Extreme.

## The Recording Engineer's Handbook

Having recorded so many big hits that have become the fabric of our listening history, Mack's engineering approach is steeped in European classical technique coupled with just the right amount of rock-and-roll attitude.

**Al Schmitt** has won more engineering Grammys than anyone in history, with 18 on his mantel. Coupled with his work on more than 150 gold and platinum records, Al's credit list is way too long to print here (but Henry Mancini, Steely Dan, George Benson, Toto, Natalie Cole, Quincy Jones, and Diana Krall are some of them), but suffice it to say that his name is synonymous with the highest art that recording has to offer.

Also included are interviews with these special non-engineer guests:

**David Bock** knows as much about microphones as anyone on the planet. From repairing vintage mics of all kinds to building newer versions of the classics, David knows why and how they work, and why they're made the way they are.

**Ross Garfield** is known as "The Drum Doctor," and anyone recording in Los Angeles certainly knows that he's the guy to either rent a great-sounding kit from or have fine-tune your kit. Having made the drums sound great on platinum-selling recordings for the likes of Bruce Springsteen, Rod Stewart, Metallica, Marilyn Manson, Dwight Yoakam, Jane's Addiction, Red Hot Chili Peppers, Foo Fighters, Lenny Kravitz, Michael Jackson, Sheryl Crow, and many more than can comfortably fit on this page, Ross agreed to share his insights on what it takes to make drums sound special.

I'm sure you'll find these interviews as much fun to read as they were for me to conduct. I'm also sure that even if you're pretty good at recording, you'll find some interesting techniques in the book that you never thought of and might find useful along the way. I know I did.