




HANS WEEKHOUT

# MUSIC PRODUCTION

LEARN HOW TO  
**RECORD, MIX,  
AND MASTER MUSIC**

THIRD EDITION



A Focal Press Book

# Music Production

We're all able to record music; a smartphone will get you quick results. But for a good sound, a lot more is involved. Acoustics, microphone placement, and effects have a huge influence on the resulting sound.

*Music Production: Learn How to Record, Mix, and Master Music* will teach you how to record, mix, and master music. With accessible language for both beginner and advanced readers, the book contains countless illustrations, includes tips and tricks for popular digital audio workstations, and provides coverage of common plugins and processors. Also included is a section dedicated to mastering in a home studio. With hundreds of tips and techniques for both the starting and advanced music producer, this is your must-have guide.

**Hans Weekhout** is one of the best-known names in the Dutch studio scene. Besides collaborating with countless Dutch artists, he has worked with international artists like Prince, Falco, and Girls Aloud. Under the moniker of Capricorn, he scored a worldwide hit with the dance track "20 Hz." As a lecturer in the Pop department of the Conservatory of Amsterdam, he teaches his students the intricacies of music production.



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# **Music Production**

## **Learn How to Record, Mix, and Master Music**

Third Edition

Hans Weekhout

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# Preface

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We've been able to record music for almost a century now. But it's only since the 1950s that technology has added a new dimension to music, namely, *sound*. Sound is never the same, and that's exactly what makes recording music a fascinating process—and unpredictable at the same time. I've been working as an engineer, producer and artist for more than 25 years, but my fascination for sound is still growing.

Recording is the most critical aspect in a musician's career. A hit reaches far and can reach a wide audience. Every time it's played, the work of musician, producer and engineer is under the microscope. So it better be good! But what is a good record? Of course, it starts with a good song and a good voice, but in pop music, **production value** is often just as important. If you listen to either The Beatles, Prince or Beck, the emotional impact of the song is interwoven with its sound; they are inseparable. This book is about the process of sound-making: it shows you how to apply both analog and digital techniques in order to get a good sound. It will show you how to use software for making professional productions in your living room.

*Music Production* was not written for aspiring engineers/producers only. It's just as valuable for musicians. Despite the fact that longtime, successful artists like Pharrell, Björk, Radiohead and Lady Gaga generally don't flick the switches themselves, they know exactly how to instruct the people surrounding them. So anyone aspiring a long-term career in the music business should learn about the technical aspects of music production. This book can be the guide!



*Thanks to Jan van der Plas.*

Hans Weekhout, Amsterdam, May 2019





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# Introduction

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At the end of the book, you'll find **Appendices** about the characteristics of sound and our hearing. I encourage you to read these first, as it will give you a better understanding of the techniques described earlier in the book.

## TECHNIQUES SHOWN IN PRO TOOLS AND LOGIC PRO

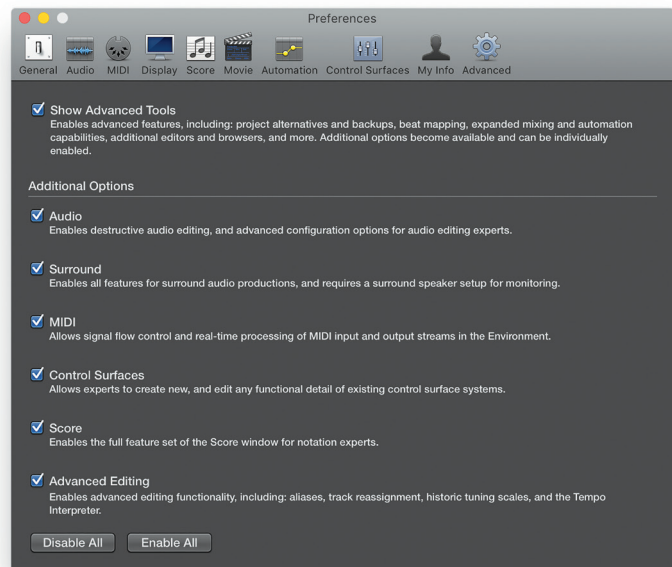
I've chosen to demonstrate techniques in two of the most popular programs: **Pro Tools** (Avid) and **Logic Pro** (Apple). In case you work with other software, that shouldn't be too much of a problem. Most programs offer similar functions, although they may be located in a different menu, under a similar name.

## FAMOUS HARDWARE . . . IN SOFTWARE

With the classic pop recordings, analog gear has been largely responsible for the sound. Some of the vintage devices have gained legendary status and are modeled into so-called **plugins**. Plugins are like little apps inside your project. They behave like the real hardware device, adapting both look and character. That character can then be imparted on a specific instrument. In the book, I will show you plugins with good reputations and demonstrate which settings could work as a starting point.

### Note for Logic Users

Before applying bespoke techniques in **Logic**, don't forget to switch on "Advanced Tools" in Logic Pro X/Preferences/Advanced Tools (see Figure 0.1). Otherwise, many functions are unavailable.



**FIGURE 0.1**  
Logic Pro: "Advanced Tools."



Check [www.musicproduction-pro.com](http://www.musicproduction-pro.com) for extra audio and video.



### Note for Pro Tools Users

On the Mac, secondary functions are commonly activated by holding the “Control” button, followed by a left click. In **Pro Tools**, however, some functions require a “real” right click. On a laptop, a right click can be executed by double tapping the trackpad with two fingers. On a desktop Mac, right-clicking must be activated in System Preferences/Mouse.

# **PART I**

# **Recording**





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## CHAPTER 1

# Production

## The Studio as an Instrument

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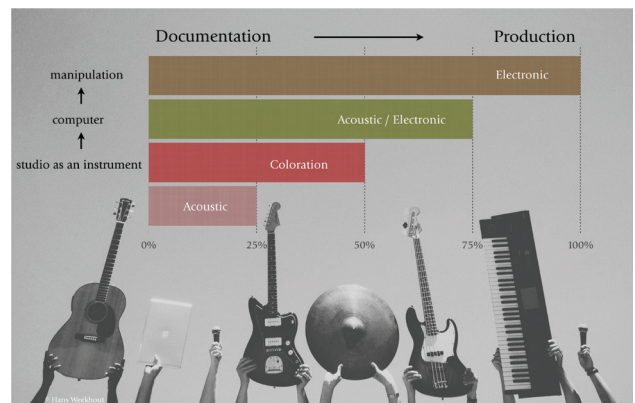
The records of The Beach Boys, The Beatles, Michael Jackson, Trevor Horn, Nirvana and Max Martin not only contained seminal songs but sounded fantastic too. For us, listeners, the sound of these classics is inextricably linked to the music forever. Organizing sound waves can cause the experience of pop music to be total. The questions with music production are, How can a song be translated into a record? and How can the listener's experience be enhanced with the help of technology? Producer Mark Ronson found the answer by adding a kick drum sample to Amy Winehouse's organic-sounding "Rehab." Nirvana-producer Butch Vig doubled guitars and vocals on "Smells like Teen Spirit" without Kurt Cobain knowing. Producer Shawn Everett made Alabama Shake's Britney Howard sing through obscure mics from Craigslist—with a cloth in her mouth, in order to force an extreme performance. These examples effectively demonstrate that there are innumerable ways for production to get to a sound that's specific.

### ► PRODUCTION VALUE

To gain insight into the production value of a given song, it can be useful to assign it one of four categories: documentation, coloration, organic/electronic or fully electronic (see Figure 1.1).

#### First Category: Documentation

Production always starts with the recording of instruments. If the producer wants an instrument to sound as natural as possible, he'll choose the best-quality microphones and record to the best medium available.



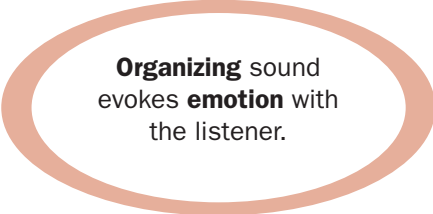
**FIGURE 1.1**

From documentation to production: farther to the right, means more sound manipulation to take place.

When mixing, the goal is to preserve a natural sound, as if the listener is part of the soundstage. Recordings in this category are classical, jazz, live recordings and many singer-songwriters' recordings. From a pop perspective, no production is involved.

### Second Category: The Studio as an Instrument

Instead of the purist's approach, a producer might decide to record a beautiful acoustic guitar in the bathroom, by using a pawnshop mic. Doing so, the resulting coloration becomes an integral part of the music and evokes an emotion with the listener. The studio is not used for documentation only but, rather, as an instrument. Coloration can be achieved by using atypical microphones or acoustics, or with tape machines, equalizers, compressors, distortion units, guitar amplifiers and other sound manipulation tools.



**Organizing** sound evokes **emotion** with the listener.

### Third Category: Computer

Third category productions typically mix acoustic and electronic ingredients. With the use of a computer, it is now possible to intervene **musically**. For example, cutting up musical phrases and reversing them, changing timing (such as *quantizing* drums) or correcting the pitch of the vocal for example. Actually, a fair share of modern pop music is in the third category, although it may **appear** as if it is from the second (or even first) category.

### Fourth Category: All Electronic

Fourth category productions might not use any acoustic element at all. In case it does get used, the producer is free to manipulate it so much that little or nothing of the instrument can be recognized in the end product. The composition and its ingredients are initiated (or at least inspired) by technology. Conventional song structures may be abandoned. When assessing a song, it's impossible to rely on "old values," such as the quality of the composition or good musicianship.

## ► SEPARATION AND CONTRAST

Separation of instruments is usually an important goal for production. That's because you want the listener to connect with every single instrument. Separation is best achieved in the recording stage, by choosing the right instrument, the best playing style and the musical notes that best support the song. These aspects are decisive for the general direction of the record. Only after all musical options have been explored, the studio and its technology come into play to build a good sound and to further improve separation and contrast. This involves finding the best mic and its position, using the best acoustics and, last but not least, making the best possible mix.

## ► DOUBLE-TRACKING

Double-tracking is an often-used studio technique in order to achieve a thicker and wider sound. Doubling happens when you record the same part on a new track, possibly with another instrument. It is commonly used on backing vocals, lead vocals and guitars. Phil Spector used to double-track every single instrument, including drums and bass. As this technique causes individual characteristics and differences to flatten, the resulting sound is somewhat “depersonalized” and less defined. That can be positive. Doubling reinforces a performance, makes it more abstract and increases the stereo width of a mix. These are important qualities in production. Doubling doesn’t add any new notes to the song; that’s why this technique perfectly fits the maxim of “*less is more.*” Soundwise, however, doubling means “more is more.”

With **double-tracking**, the musical content of the song remains the same.

Examples of common doubles:

- A fuzz guitar on the left is doubled with a second fuzz guitar on the right
- An acoustic guitar on the left is doubled with a second acoustic guitar on the right



**FIGURE 1.2**

Crescente Studio, Tokyo, Japan, with a (rare) 72-channel Focusrite mixer.



- A string pad (chords) from one synthesizer is doubled with a sound from another synthesizer
- The lead (and/or) backing vocals are recorded multiple times on individual tracks
- An acoustic piano and an electric piano play the same part

All in all, production is about reinforcing the emotion that's contained within the song. When the sound is "right," the listener can be affected emotionally. This book focuses on production in the second and third category, with the occasional trip to the left or the right.

## CHAPTER 2

# In the Studio

Most of the great pop classics wouldn't have been possible without the experience and talent of many skilled people working together in a large studio. What exactly are the roles of those people, and how did they get there? How have the big temples of sound been responsible for the sound of pop music? And what does modern-day recording look like?

The evolution of studios and technology has been of great influence on the sound of pop music. Since the 1950s, sound has changed roughly per decade.

### BEFORE THE 1960S

Orchestral recordings were made in large rooms with one or more microphones. The natural reverb of the acoustic space was an important ingredient of the sound. After recording, the balance between the instruments could not be altered anymore.

### THE 1960S: MULTITRACKING

By using a 4- to 8-track **multitrack recorder**, it became possible to record multiple microphones separately. This allowed balancing signals after recording, rerecording of individual instruments and changing the sound of an individual instrument. People discovered that manipulating instruments was more effective by separating them acoustically. To minimize **crosstalk**, acoustic screens (*gobos*) were positioned between instruments. Multitracking became the standard.

### THE 1970S: ISOLATION

Technology advanced quickly; multitrack recorders with 24 tracks became the norm. This allowed a separate recording of just about every single instrument. To minimize leakage between microphones, studios built iso-rooms (or booths; see Figure 2.2). In these acoustically damped spaces, musicians were physically separated, hearing the music through headphones, and maintained visual contact through windows. As the booths were acoustically almost dead, the instruments

**FIGURE 2.1**

Control room A at Sound Emporium Studios, Nashville, USA. The wooden frame on the back wall is a “QRD diffuser,” which is used to scatter sound waves. Behind the walls are “bass traps”: spaces that are partly filled with sound-absorbing materials such as rockwool or glass wool. Note the slanted walls.

Source: Photo courtesy Jeff Carpenter/ReadyLight Media & Sound Emporium Studios.

**FIGURE 2.2**

Recording room at Sound Emporium Studios. Both asymmetrical surfaces and different floor and wall materials help sound to become diffuse. Acoustic screens are used to acoustically isolate musicians.

Source: Photo courtesy Jeff Carpenter/ReadyLight Media & Sound Emporium Studios.



sounded dry. In case reverb was needed, plate reverbs or echo chambers were used (see Chapter 14, “Effects | Reverb”). If you listen to typical 1970s’ bands like Thin Lizzy, Steely Dan, Pink Floyd, The Eagles and Chic, the close and dry sound clearly illustrates the big influence of the studio and its technology on pop music.

### THE 1980S: MORE, MORE, MORE

It was discovered that with more reverb, productions could be made to sound bigger. The invention of **digital reverb** made reverb so accessible and easy to use that it was used in great amounts. For more separation on the drums, **noise gates** (see Chapter 27, “Advanced Mixing Techniques: Drums”) were used to separate the individual microphone signals of a drum kit. In the mix, these artificially separated signals had to be forged into a whole again. This caused the sound to sometimes turn out unnatural and artificial. By synchronizing two or three 24-track machines, track counts increased to 48 or 72.

### THE 1990S: DIGITAL TECHNOLOGY

Digital technology entered the studio. It became possible to record on a 24-, 32- or 48-track multitrack machines digitally. Drum sounds were enhanced or even replaced with samples, drummers were replaced by drum loops. Gradually, more and more production tasks could be executed with a computer.

### 2000S: IN THE BOX

Why hire a big studio if you can achieve the same result conveniently, at home? Expensive hardware from the traditional studio is made redundant by computers. Multitracking, mixing and applying effects can be done efficiently “in the box” with an infinite number of tracks. Session recall is only a mouse click away, and projects can be exchanged quickly thru the internet.

#### ► The Producer

Traditionally, the job of a music producer can be compared to that of a film director. A producer is in charge of the recording and brings in ideas for the music. He develops a vision about how the final product should sound. How can the artist be guided to express himself in the best creative way? The producer decides on the studio and the engineer. A good producer creates a pleasant atmosphere and inspires all people in the room to bring out their best. Experience, psychological qualities and a certain authority are needed to guide the artist through the often-complicated process of record making. That’s why it is impossible to become a full-fledged producer through study or courses.

A producer is also the connecting factor between the artist and the record company. The record company will want a vote in the songs to be recorded and the sound for the final product. They allocate a budget for renting the studio, the engineer and the musicians. It’s the producer’s job to manage that budget.

Most producers are accomplished engineers themselves. Yet there are also producers who may never touch a knob, such as Rick Rubin, Trevor Horn, Quincy Jones, George Martin and Phil Spector. Although they might know the ins and outs of the equipment, they leave the technical tasks for the engineer. The producer needs full attention for guiding the artist, as getting a good performance is the highest goal.

Some well-known producers of the 20th century include Les Paul, Sam Philips, Phil Spector, Joe Meek, George Martin, Brian Wilson, Glyn Johns, Gamble & Huff, Chinn & Chapman, Phil Ramone, Roy Thomas Baker, Todd Rundgren, Lee “Scratch” Perry, Stock, Aitken & Waterman, Eddie Kramer, Jeff Lynne, Arif Mardin, John “Mutt” Lange, Chris Thomas, Quincy Jones, Toni Visconti, Giorgio Moroder, Steve Lillywhite, John Leckie, Andy Wallace, Stephen Street and Trevor Horn.