THE ART OF MIXING

A VISUAL GUIDE TO

RECORDING ENGINEERING PRODUCTION

by

DAVID GIBSON

THIRD EDITION

A **Focal Press** Book

ROUTLEDGE

The Art of Mixing

> "David Gibson's groundbreaking work is a real eye-opener for all of us, music professionals and casual listeners alike. He has single-handedly rethought the whole metaphor for the visual representation of recorded music and conjured up a brand new way to interact with it. It's high time we took a new look at the antique user interfaces employed by typical MIDI and same editing tools – and this book is a great place to start." – Thomas Dolby Robertson

David Gibson uses 3D visual representations of sounds in a mix as a tool to explain the dynamics that can be created in a mix. This book provides an in-depth exploration into the aesthetics of what makes a great mix. Gibson's unique approach explains how to map sounds to visuals in order to create a visual framework that can be used to analyze what is going on in any mix.

Once you have the framework down, Gibson then uses it to explain the traditions that have been developed over time by great recording engineers for different styles of music and songs. You will come to understand everything that can be done in a mix to create dynamics that affect people in really deep ways.

Once you understand what engineers are doing to create the great mixes they do, you can then use this framework to develop your own values as to what you feel is a good mix. Once you have a perspective on what all can be done, you have the power to be truly creative on your own – to create whole new mixing possibilities.

It is all about creating art out of technology. This book goes beyond explaining what the equipment does – it explains what to do with the equipment to make the best possible mixes.

David Gibson has been teaching, engineering, and producing groups in major 24 track studios since 1982 and is the founder of Globe Institute of Recording and Production, which offers classes in San Francisco and online. He has done recording for James Brown's band, Bobby Whitlock (Derek and the Dominoes), The Atlanta Rhythm Sections, Hank Williams Jr.'s band, members of the Doobie Brothers, Lacy J. Dalton, and Herbie Hancock. He is also the co-author of the top-selling book on producing, *The Art of Producing*. Gibson is currently the #1 seller of Sound Healing music, also used in hospitals across the US, and he is the author of the best-selling book, *The Complete Guide to Sound Healing*. Gibson is the inventor of the patented Virtual Mixer mixing plug-in and a Virtual Reality healing system where you can place sounds inside a 3D image of the body.

The Art of Mixing

A Visual Guide to Recording, Engineering, and Production

Third Edition

David Gibson

Routledge
Taylor & Francis Group
NEW YORK AND LONDON

Third edition published 2019
by Routledge
52 Vanderbilt Avenue, New York, NY 10017

and by Routledge
2 Park Square, Milton Park, Abingdon, Oxon, OX14 4RN

Routledge is an imprint of the Taylor & Francis Group, an informa business

First edition published by Mix Books, an imprint of artistpro.com LLC 1997
Second edition published by Thompson Course Technology PTR 2005

Library of Congress Cataloging-in-Publication Data
Names: Gibson, David, 1957– author.
Title: Art of mixing : a visual guide to recording, engineering, and production / David Gibson.
Description: Third edition. | New York, NY : Routledge, 2019. | Includes index.
Identifiers: LCCN 2018028427 (print) | LCCN 2018029414 (ebook) | ISBN 9781351252218 (pdf) | ISBN 9781351252201 (epub) | ISBN 9781351252195 (mobi) | ISBN 9780815369479 (hardback : alk. paper) | ISBN 9780815369493 (pbk. : alk. paper) | ISBN 9781351252225 (ebook)
Subjects: LCSH: Sound recordings—Production and direction. | Popular music—Production and direction.
Classification: LCC ML3790 (ebook) | LCC ML3790 .G538 2019 (print) | DDC 621.389/32—dc23
LC record available at https://lccn.loc.gov/2018028427

ISBN: 978-0-8153-6947-9 (hbk)
ISBN: 978-0-8153-6949-3 (pbk)
ISBN: 978-1-351-25222-5 (ebk)

Typeset in Frutiger
by Florence Production Ltd, Stoodleigh, Devon, UK

This book is dedicated to all those who just want to know how to make it sound better.

Contents

Visuals

Preface to the First Edition

This book has been designed to answer the elusive questions, "What makes a great mix?" and "How do you go about creating a great mix?" Although most people know what they like, they often don't know how to achieve what they want when they're in the studio.

To answer these questions, I introduce and use visual representations of sounds as a tool for understanding the whole world of dynamics that an engineer can create with the equipment in the studio. This visual framework has now become an established tool in the Industry. Colleges around the world use the visuals to explain mixing theory.

It's easy to learn the function of each piece of equipment in the studio; you can read user's manuals or the tons of good books available that explain the equipment. The difficulty lies in knowing how to use the equipment and learning what combinations of equipment are used to create great sounding mixes. Once you know what the knobs do, which way do you turn them?

In other fields of art, there is no shortage of books that attempt to explain the whole world of aesthetics. From music to painting, scholars have tried answering the question, "What makes great art?" But recording is a relatively new field, and very little has been written about the aesthetics of mixing.

This is one of the first books to explain the aesthetic side of creating a great mix. This is no simple feat, as there are many musical styles based on any number of different instruments, all of which are recorded differently. Each style of music has its own world of values that are changing constantly. The number of variations is endless. Perhaps no one has attacked this complex subject of mixing due to the lack of a framework to analyze the process. Without a framework, it is difficult to explain what is going on and hard to remember all the different things that can be done in a mix. In the field of music, music theory provides this framework. This book introduces a framework for understanding all the dynamics that can be created in a mix.

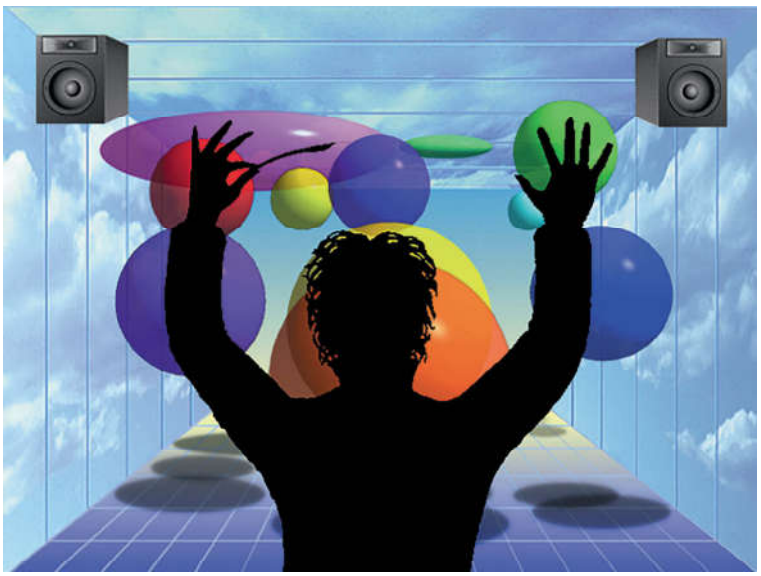
The primary goal of this book is to give you a perspective on how the equipment works together to create every mix in the world. Once you have a perspective on what can be done, you can be truly creative on your own.

It has been said that there are no rules when it comes to recording. However, in the recording industry, there are absolutely certain high-level values that are commonly held. We know this

Visual 1.
Sound Imaging of Instruments

because there are certain professional engineers who can create a great mix every time they sit in front of a console. These engineers command exorbitant fees because they are capable of coming up with something that most people perceive as great, every time. So what is it they are doing? They are not performing magic. They are only doing some very specific things with the available mixing tools. If you could simply understand and learn what they do, you could start down the path to becoming a great engineer. Once you have a map and you know where you're going, you'll get there much faster! And once you understand what the successful engineers are doing, you can create your own style. This book will help you develop and recognize your own values through visuals, because visuals help us to remember. After all, a picture is worth a thousand sounds.

This book will help you discover the high-level values that major engineers have and help you do the most difficult job of all: make art out of technology. This book provides the missing link between technology and aesthetics. Using the visual framework, for the first time, we can see all that goes into making a good mix, and we can begin the lifelong exploration in detail. This is the art of mixing.



Visual 2.
Structuring a Mix

Preface to the Third Edition

What I Have Learned from the Previous Editions

Since I first wrote this book, a wonderful thing has happened. Now that this framework has become commonly accepted in the field, many have written about how this has helped them, but it has also given people a way of expressing and discussing dynamics in mixing. It has opened up a whole new world of creative exploration. Therefore, I have been receiving a huge number of ideas that have continued to expand the creative landscape of possibilities.

But more importantly, it has opened up a whole new world for myself. Using the visual framework, I have been able to expand my repertoire of recording techniques immensely. Now whenever I hear something on the radio or a new CD, I am able to immediately recognize everything that the engineer did to create that mix. Because of this, I now have a better perspective than ever on how every dynamic might be used in different types of music and songs – and it gets deeper and more complex every day.

It is my hope that this perspective can be transferred to you as it has been for thousands of others. It is a very powerful tool.

It's really not so much about
me showing you a **few dozen** techniques,
but about providing you with a framework
that you can use to discover
hundreds of techniques hidden in the types of
music, songs, and mixes that you like – then you can
use them in your own mixes appropriately.

But now a whole new realm has opened up for me. Besides Audio Recording, we now teach Sound Healing and Therapy at my College, Globe Institute. I have been studying how sound and music affect a person physically, mentally, emotionally, and spiritually for over 15 years. We have put on seven international sound healing conferences and we also have a sound healing therapy center.

What this has done is it has given me a whole new perspective on how to make music and recordings that touch people on a much deeper level. I now have over 100 CDs that are helping people with a full range of issues including relaxation, pain management, sleep, ADD/ADHD, PTSD, depression, anxiety, grief, autism, opening the heart, and accessing higher states of consciousness. This wider perspective has been helpful not only for so-called "healing" music, but also for any style of music that I may be working on.

There are many detailed aspects that can be very powerful. These include:

- Tuning to auspicious concert pitches (like 432 Hz).
- Using ancient tuning systems (like just intonation or Pythagorean).
- Relating to frequencies based on chakras.
- Using binaural beats for brainwave entrainment.
- Being aware of how different timbres and instrument sounds affect us physically and emotionally.
- Using a slow fade on the home note of the key of the song to leave people in a profound state of peace.

- Tuning the tempo to the key of the song, and even tuning the key of the song to a person's Soul note.
- Holding an intention with 100% focus throughout the recording and mixing. It has been shown scientifically that a consistent intention affects people in very powerful ways.
- Tuning the tempo to your breath – particularly while holding a specific intention.

These are just a few of our secret weapons for making music and recordings move us in even more profound ways than it already commonly does.

It brings us back to the core aspect of what we are doing . . .

Creating musical recordings
that have
Meaning
more than at the mental level.

We all know how magical music can be.
We are just now learning the keys as to why . . .
so we can use those keys
to open up deeper levels of bliss, intensity, ecstasy and peace
than ever felt before.

And yet
we've only just begun
understanding
how it all works.

Acknowledgments

There is a wide range of people who helped me along the way to this point where I am writing this book. As with all information, over the years, I have simply gathered together a large amount of information from a huge number of contacts and sources – and then there are those divine inspirations.

First, I probably would have never gotten into this business without the suggestion of my brother Bill. He was the first to say, "Ever thought about being a recording engineer?" Then, there were my various music instructors and all of my recording instructors, including Bob Beede and John Barsotti. There was also Herbert Zettl, whose book on video aesthetics helped to inspire the structure of this book. Craig Gower was also another inspiring force in learning about working with music. And then there was Chunky Venable who was kind enough to have the faith in me to run his studio even though I was such a newbie at that time. Much thanks goes to my producer friend, Ken Kraft, with whom I learned many of the techniques within.

There are also those various artists, engineers, and producers who have influenced my values on this long road. Everybody from Pink Floyd to Bob Clearmountain have made a huge impression on my recording and mixing values.

A very special thanks goes out to my dear friends Steven Rappaport and Ginger Lyvere, who were there at the inception of this book. They spent many hours looking over rough manuscripts, brainstorming over various ideas and concepts, and encouraging me to go forth with the project.

I would especially like to thank those who spent the time to read through earlier versions of the book at no cost: David Schwartz, Charlie Albert, Fred Catero, Roy Pritz, Bob Ezrin, and Thomas Dolby. A special thanks to Fred for his exuberant and detailed critique of the book. Extra thanks to Thomas for his evangelical support of the whole visual paradigm.

Thanks are in order to Todd Stock, who has helped with editing and been a spiritual advisor of sorts. Thanks to Archer Sully, who has been helping to bring into reality an actual working prototype of the Virtual Mixer. Warm thanks go to Donna Compton and Patrice Newman for helping with the rough editing of the book and critiquing of the visuals. Special thanks to Donna for all her kind and caring support over the years. Thanks go to Fred Mueller for much of his graphics work on the book. Extra thanks go to Melissa Lubofsky for her visual inspirations and dedicated work in creating many of the graphics, as well as her patient efforts in helping me to learn Photoshop so I could do many of the visuals on my own. Thanks also to Alon Clarke for his enthusiasm and creativity with the photography.

Much appreciation goes out to all of the gang at ArtistPro Books for their extremely helpful, creative, and professional support: Mike Lawson, George Petersen, Lisa Duran, and Linda Gough. Special thanks to Mike Lawson for believing in the "bubble book" when others thought it was "woo-woo."

And finally, I would be amiss if I didn't thank all of my students from over the years for the innumerable suggestions and inspirations that they have brought to me. They are the real reason for this book. May this book begin an ongoing dialog about what makes a great mix, to light the way for students in the future, so none of us are "all mixed up" ever again.

Introduction

Chapter 1: All Aspects of a Recorded Piece of Music

This book is designed to explain how to create great mixes. However, the mix is only one aspect of what makes a great recording. Other factors also contribute to what is perceived as a quality recording and mix. The purpose of this chapter is to put everything that goes into making a quality recording into perspective. "All Aspects of a Recorded Piece of Music" identifies and defines each of the thirteen components of a great recording: intention, concept, hooks, melody, rhythm, harmony, lyrics, density of arrangement, instrumentation, song structure, performance, quality of the equipment/recording, and the mix. We'll then explore what the recording engineer can do to help refine each of these components. My book, "The Art of Producing," is dedicated to helping refine each of these components in more detail.

Each of these thirteen aspects must be at a minimum level of good quality. The overall quality of the recording is only as good as the weakest link. The mix is only one of the thirteen aspects, but it is one of the most powerful because it can hide some of the weaker aspects, highlight the magic in the stronger aspects, or create its own magic. The rest of the book then focuses on all of the fine details of what can be done with the thirteen aspects – the mix.

Chapter 2: Visual Representations of "Imaging"

"Visual Representations of 'Imaging'" introduces the visual framework for representing "imaging," the apparent placement of sounds between the speakers.

Section A shows the difference between the perception of physical sound waves coming out of the speakers and the imagined perception of imaging. This is important because the two are sometimes confused, and the visuals represent only imaging, not physical sound waves.

Section B, "The Space Between the Speakers," introduces the visual mapping of volume, frequency, and panning, and defines the boundaries of imaging (the limited space where a mix occurs between the speakers).

Section C continues with the mapping of audio to visuals and explains the precise considerations that were used to determine the size, color, and shape of different sounds and effects. It explains how volume, frequency range, delays, and reverb affect the amount of space used up by a sound. The section explains how you can place and move sound images throughout the 3D space between the speakers using volume, panning, and equalization. The section then uses the sound images to introduce the different structures of mixes that can be created in the studio.

Chapter 3: Guides to a Great Mix (Reasons for Creating One Style of Mix or Another)

"Guides to a Great Mix" explains all of the components to take into consideration when designing a mix. If you follow what the music and song are telling you to do, the mix will be more cohesive and powerful, and it will more clearly express what the song is all about.

Section A explains how the style of music affects the way a song is mixed.

Section B describes how the song and all of its details (the thirteen aspects) dictate the way a song is mixed. It also explains how each aspect might affect the placement of volume, EQ, panning, and effects.

Section C discusses how the dynamic mix of people involved – the engineer, the band, the producer, and the mass audience – affects the way a song is mixed. It explains the engineer's role in balancing the values of everyone involved. The most difficult job of all is to take the values, suggestions, and ideas of everyone involved in a project, decide which ones are best for the project, then diplomatically work with everyone to bring about the best recording and mix possible.

I have sometimes found that if I have walked on anyone's toes (or ego), or upset anyone along the way . . . that they will not like the mix no matter how great it is. The truth is that the energy of the people during the recording gets embedded in the music itself. Therefore, I found it is critical to work together in kind and considerate ways when expressing intense caring for wanting something to be a certain way.

Chapter 4: Functions of Studio Equipment and Visuals of All Parameters

"Functions of Studio Equipment and Visuals of All Parameters" utilizes the images outlined in Chapter 2 to describe the function of each piece of studio equipment in the mix. It briefly, but technically, explains what each piece of equipment does. (As you will see, the visuals make the details of complex functions easily understandable.)

Section A explains the basic functions of faders, compressor/limiters, and noise gates and how to set them for different instruments in various styles of music and songs.

Section B explains the differences between various types of equalizers – graphics, parametrics, and rolloffs – and describes all the frequency ranges found in sounds. This section also covers the mathematical harmonic structure of the individual frequencies that make up all sounds, or *timbres*. These harmonics are the basic building blocks of sounds. Understanding the harmonic structure is critical to understanding why an equalizer works differently on different sounds. When you use an equalizer, you are changing the volume of the harmonics in that sound, and every sound has different harmonic content. Most importantly, this section gives you a step-by-step process for using an equalizer to make something sound good – or just the way you want it to sound!

Section C covers the basics of left to right placement or panning in a mix.

Section D describes each of the common functions and parameters of delays, flangers, choruses, phase shifters, reverbs, harmony processors, and pitch correctors.

At this point, all of the basic functions of the equipment, and how each parameter is mapped out visually will have been covered. Now, when we use the visuals to show how all the equipment can be used together to create different styles of mixes, you will understand all of the fine details of the visuals.

Chapter 5: Musical Dynamics Created with Studio Equipment

"Musical Dynamics Created with Studio Equipment" explains the missing link between the dynamics created by the equipment and the dynamics in music and songs. I'll first discuss the incredibly wide range of possible dynamics that different people perceive in music, including feelings and emotions; thought forms; psychological, physiological, and physical reactions; visual imagery; and cultural and spiritual connotations.

I'll then embark on an in-depth survey of how each piece of equipment in the studio can be used to create musical and emotional dynamics. There are four main types of mixing tools that can be used to create dynamics: volume, EQ, panning, and effects. I then outline and define three levels of dynamics that can be created with the four tools: individual placement, overall patterns, and movement (changing settings).

I go into detail on how common instrument sounds have traditionally been used to create dynamics at each of the three levels.

Learning the traditions that have come to dictate the placement and movements of sounds in a mix for different styles of music helps you to make the mix better fit the song and style of music.

This is especially important because some of these traditions are very strict for certain styles of music like country or classical music. And, often the people doing these styles of music subscribe to these traditions very strictly.

On the other hand, once you know these traditions you can then push the limits of what is acceptable (and change the world bit by bit). If you go too far off the deep end of creativity, people may not accept it.

The coolest part is when you learn the traditions, and are working with someone who is a free creative spirit and you are able to mix traditions of mixing for different genres of music in order to create a whole new creative mix that no one has ever imagined. Once you can see all the possibilities, you can then put them together in new and unique ways.

Chapter 6: Styles of Mixes

"Styles of Mixes" is an exploration of the incredibly powerful dynamics that can be created when you use all of the equipment together to construct an overall style of mix. It explains how you can build "high-level dynamics" by combining multiple settings using different mixing tools. When all of the equipment is used to create similar emotional dynamics, you can produce some very powerful overall mixes.

Once you have formed a context or a particular style of mix, the most intense dynamic is to completely change all of the settings on all of the equipment at once to create a completely different type of mix or context. There is nothing so intense and powerful when it comes to engineering. This chapter discusses that technique.

Chapter 7: Magic in Music, Songs, and Mixes

"Magic in Music, Songs, and Equipment" explores the variety of possible relationships between the dynamics you can create in a mix and the dynamics that are found in music. Does the equipment enhance or cause tension with what is going on in the music and song? Most importantly, does it fit? This chapter is designed to set you on your way in this lifelong exploration of all of the relationships between mix dynamics and song dynamics. After all, relationships are what it's all about.

At this point, you will have a framework for understanding and remembering all that can be done in a mix. Then, by asking yourself if you like what they are doing, you will develop your *own* style and you can confidently do whatever *you* want.

Chapter 8: 3D Sound Processors and Surround Sound Mixing

Surround sound mixing has been used in movies for years, and is now becoming widely accepted as a format for listening to music. "3D Sound Processors and Surround Sound Mixing" takes all of the concepts discussed in this book and applies them to the use of 3D sound processors and mixing in surround sound. Visuals are especially useful in exploring all of the possibilities in this evolving mixing format.

Chapter 9: Mixing Procedures

"Mixing Procedures" details the step-by-step processes that are required to complete a mix.

The first section, "The Mixing Process" takes you through a procedure for building a mix. The second section, "Automation," explains the functions and use of automation, along with details on how to go about it. The third section, "Mastering," covers all that goes into applying the final touches to your stereo master recording, before pressing your hit CD.

Appendices

The appendices include outlines of the EQ and mastering processes for quick reference. They also include all of the homework exercises from the book as well as an explanation of the Virtual Mixer that uses the visuals in the book as a 3D interface for mixing.

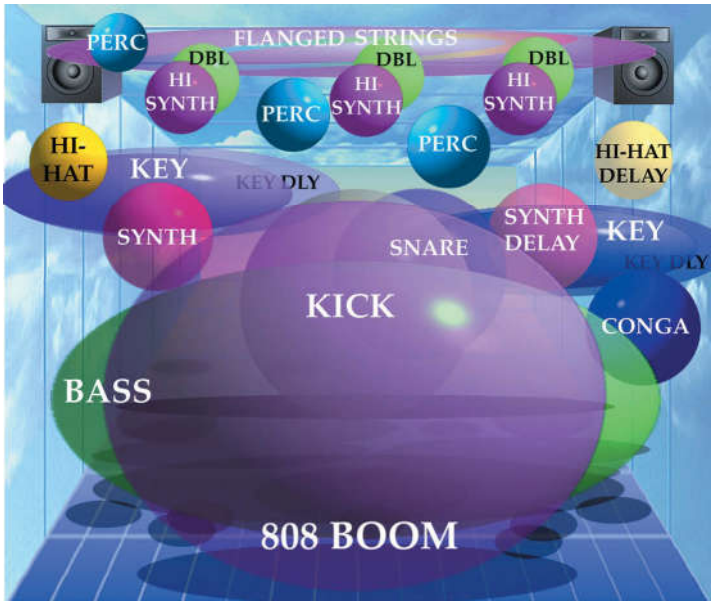
The Best of the Color Visuals

The color visuals are representations of particular moments in the mix. In order to represent a true mixing process, they would be flashing on and off to the music. Therefore, some of the visuals may look busier than the mix really is.

Of course, every song has its own personality and is mixed based on that. Therefore, don't assume that there is only one way to mix any style of music. These visuals are only a reference point from which you can begin to study what is done in mixes for various types of music.

With all of this in mind . . . enjoy.

Visual A. Electronica Mix



Generally a pretty busy mix with an 808 boom loud and out front. Note the fattening on the bass, and the doubling on each of the keys. Note the delay on the synth and hi-hat. Especially unique is the doubling of the hi-synth with another instrument. The super high strings are flanged for a subtle, spacey effect. The snare is not really too loud in this particular mix.

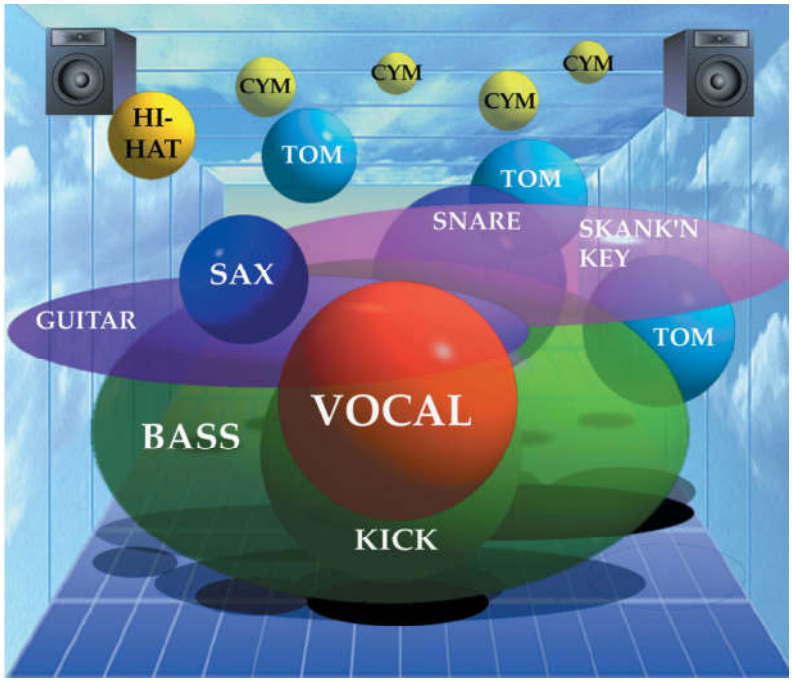
Visual B. Blues Mix

Generally a pretty clean, clear, out front mix. Note the bass is quite loud overall, with the kick drum not far behind. The rhythm guitar, the xax, and especially the lead guitar are right out front. The vocal is set back in this mix a bit, but this is not always the case. The piano is set further back a bit in the mix, but is spread in complete stereo. The toms, hi-hat, and cymbals are all set back a bit, and the snare is a bit low in this mix, which is not necessarily typical of blues.

Visual C. Rap Mix

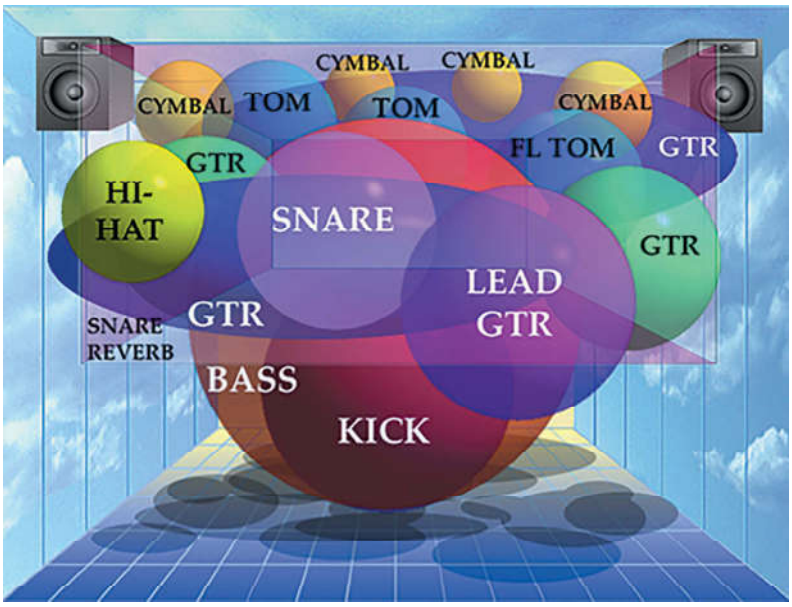
The rap mix commonly has the 808 boom boom'n and a loud vocal (though this does vary). The key, guitar, and scratch'n are all spread in stereo with fattening. Note the extremely loud clap and hi-hat; the kick is also right out front. In this mix, the snare is back a little. Also cool is the delay on the synth panned next to it. Finally, note the shaker panned opposite the hi-hat.

Visual D. Reggae Mix



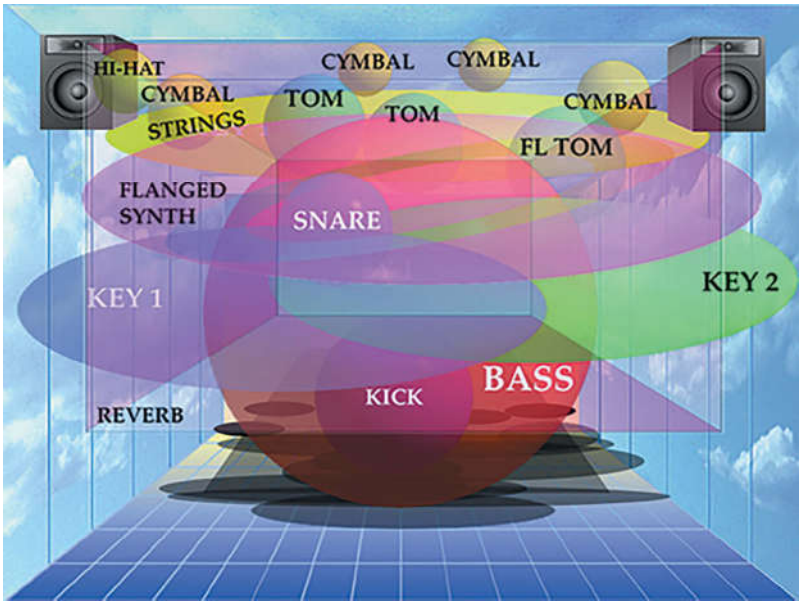
These days, reggae mixes tend to have a huge bass with the kick not far behind and the vocal right out front. Note the clarity of the sax. Both the guitar and the skank'n key are spread in stereo so they overlap a large amount. The snare is set back a little but not always, and the hi-hat is commonly right out front.

Visual E. Heavy Metal Mix



A very full arrangement and mix. Note the clarity of the low end (kick and bass), even though it is an extremely busy mix. The hi-hat, snare, and especially the lead guitar are right out front. Note the multiple guitar parts with a few panned in stereo. The reverb is present but not so loud that it muddies everything. There isn't much room left for very many effects unless there is a breakdown section in the song. The overall effect is a massive, powerful wall of sound.

Visual F. New Age Mix

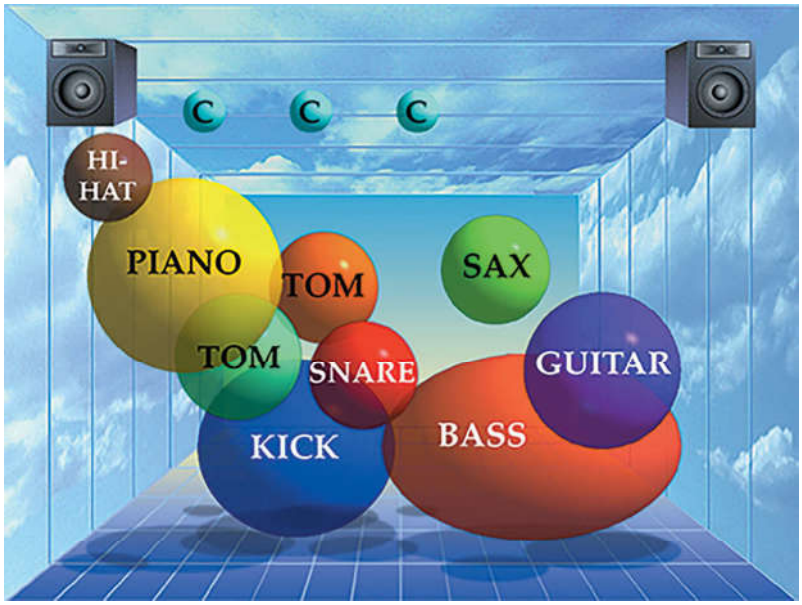


Generally, the mix is extremely full with nothing too sharp or cutting (although often individual lead sounds can be very strong). Note the fattening on the keys and strings, filling out the space. The stereo flanged synth is quite prominent here, and the bass is huge in this particular mix. The low end is kept nice and clean here, and the high-frequency cymbals placed above it all.

Visual G. Alternative Rock Mix

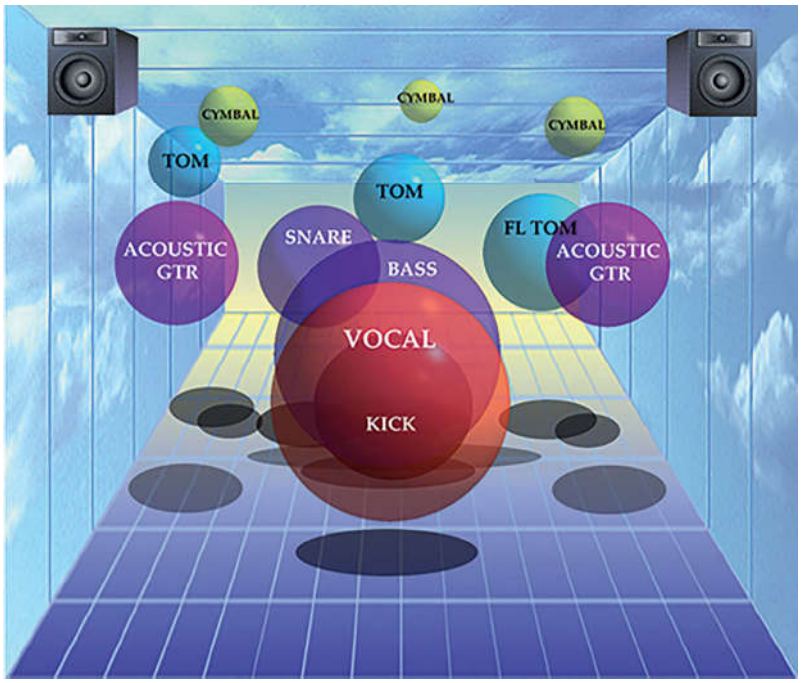
Quite full with lots of fattening and overlapping sounds. The lead guitar is spread in stereo with a rhythm guitar behind it and another stereo guitar in the background. A nice, clean low end, even though the mix is full. The kick and bass are quite present.

Visual H. Acoustic Jazz Mix



Note the incredible cleanliness and clarity of the overall mix. The bass is panned to the right and doesn't have much high end (not always the case). The guitar is right out front with the piano and the hi-hat. The kick is quite loud here, which is not typical.

Visual I. Folk Music Mix



This type of music is typically mixed very clean and clear with hardly any effects. The vocal is normally right out front. Note the presence and complete left and right panning of the acoustic guitars. The snare is set back, and the bass guitar and kick are not too overwhelming.