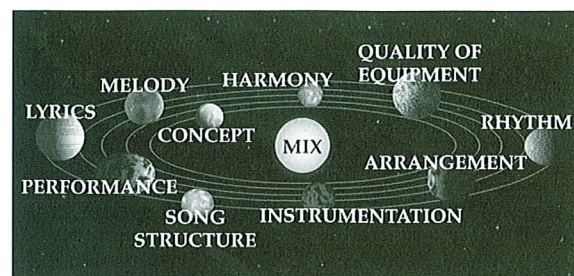


Traditions and Common “Musical Dynamics” Created with Studio Equipment

To make a great mix, we must determine what you can do in a mix as opposed to what you can do during the recording.



Visual 118. Mix as Center of 11 Aspects (see color Visual 3C)

When mixing, the four types of tools that you can use to create all the different styles of mixes in the world are *volume faders, panpots, equalization, and effects*.

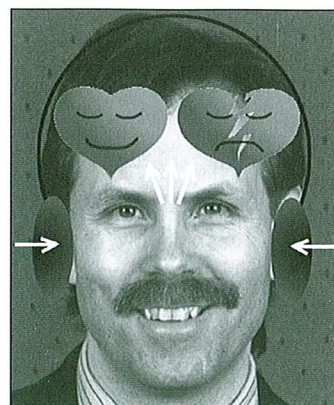
The art of mixing is the way in which the dynamics we create with the equipment in the studio interface with the dynamics apparent in music and songs.

When we speak about dynamics, we are not talking about the common terminology used for volume dynamics; we are not talking about changes in loudness. We are talking about changes in intensity.

THE DYNAMICS IN MUSIC AND SONGS

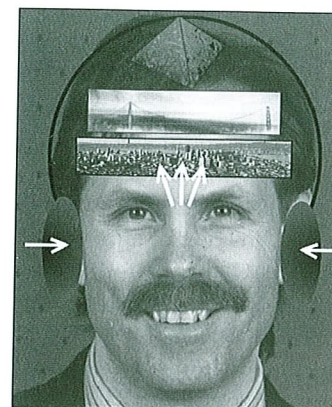
Before we explore the dynamics that can be created with the technical tools, let's explore the dynamics found in music and songs. A dynamic in music is anything that you get out of music. Music touches us in just about every aspect of our lives, and however you relate to music is, of course, valid. There are millions of dynamics discernible in music that affect us theoretically, emotionally, physically, visually, psychologically, physiologically, and spiritually.

The most common dynamic that people feel in music is “up” and “down,” whether it be on a physical, abstract, emotional, or psychic level. Some people feel very strong emotions when they hear certain types of music. It can make them happy or sad. It can crack them up with laughter or bring tears to their hearts.



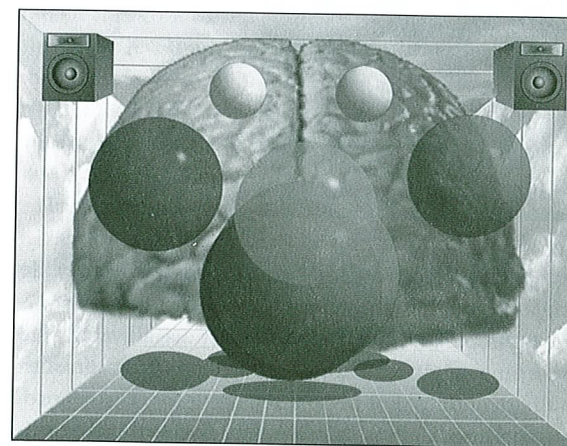
Visual 119. Some People Get Feelings and Emotions Out of Music

Some people see structure in music. And often they relate these structures to common structures found in the world, such as buildings, bridges, and pyramids.



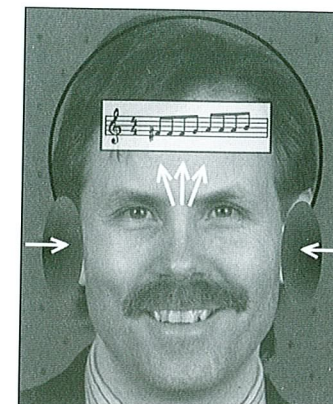
Visual 120. Some People See Structure and Form in Music

There are those who actually see the workings of the brain in a song. They see the way in which our minds work as being similar to the flow of a song. Other people even think of songs as thought forms. In fact, there are bands that write their music to represent the way the brain works. This explains the common theory that music is just an extension of our personalities.



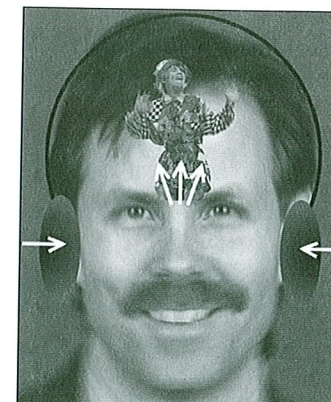
Visual 121. Some People See Thought Forms and the Mind

Some people relate to music through music theory. They see notes on a scale, the intervals between notes, and chord structures. There are thousands of schools that teach the incredibly complex detail found in the study of music itself.



Visual 122. Some People See Music Theory

Most of us also have physical reactions, like toe tapping, finger snapping, head bopping (or banging), and dancing. Much of the study of dance is how movement is related to music. Shake, rattle, and roll. Physically, music can make us feel good from head to toe.



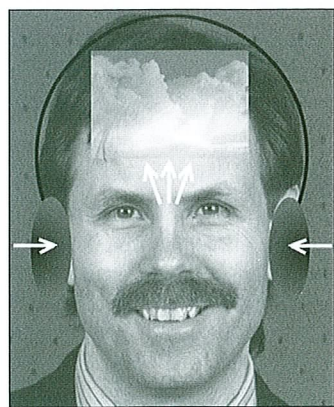
Visual 123. Some People Move When They Hear Music

Not only does music move us physically, there is also a whole world of music therapy based on the healing vibrations of sound. Just imagine—if you could place instruments in a mix at different places in your body—where would you put the kick drum? How about the guitar or string section? Try a tuba in your tummy or sitar in your chest. Or how about reverb in your brain? Quite possibly, certain songs played inside of different organs in our bodies might even cure diseases.



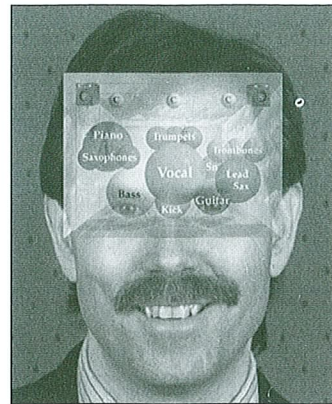
Visual 124. Where in Body Would You Put Sounds in Mix?

Some people see visual imagery or abstract colors and images. Walt Disney saw flying elephants.



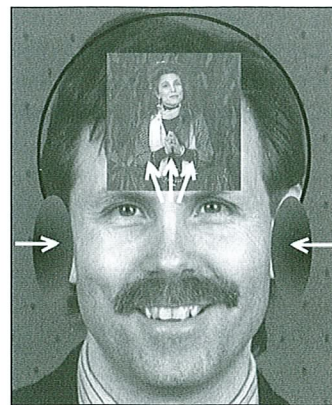
Visual 125. Some Get Imagination Out of Music

Just check out MTV to see a whole other world of visual imagery. There are also those who see bubbles.



Visual 126. Some See Bubbles

Then there are those who see spiritual connotations. The whole world of religious music is a good example. Music is often seen as a direct connection to God. Others go elsewhere.



Visual 127. Some See Spirituality in Music

So now you see that music can evoke a wide range of possible dynamics in people. They are as varied as people and life itself, and they are all valid. The recording engineer should look for and be sensitive to the dynamics that people see in music. The recording engineer's job is to create musical dynamics with the equipment that reveals or enhances the magic people find in music.

THE DYNAMICS CREATED BY THE EQUIPMENT

So, what are the dynamics that we can create with the equipment in the studio? There are four types of tools to create all dynamics in the world: volume faders, panpots, equalization, and effects. To make the complexities of dynamics created with these four tools easier to understand, I will break each down into three levels. These levels increase in intensity, with Level 3 being the most intense.

Level 1—Individual Placement and Relative Settings

This is the difference between the individual levels or settings of each piece of equipment. Setting volumes, EQ, panning, and effects at specific levels creates a relatively minor emotional effect. For example, placing a vocal louder or softer or left or right of center, EQ'ing it to sound natural or unusual, or adding effects or not will all affect the way that the vocal comes across in the song.

Level 2—Patterns of Placement

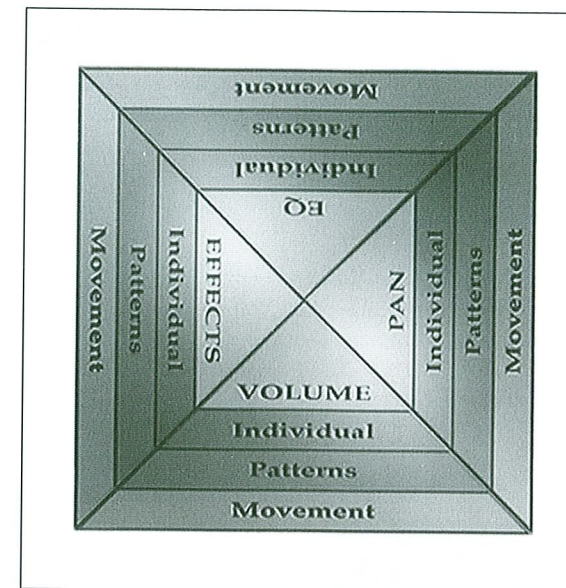
This is the combination of the settings for all the sounds in the mix. These dynamics make more of a difference than those in Level 1. For example, if you set all the volumes "even," little variation between the loudest and softest sounds in the mix, the mix will sound quite different than if you set the levels so that the dynamic range between softest and loudest sounds is wide. Also, lopsided panning, an overall bright EQ for the entire mix, and effects that collectively tend towards a certain style of mix will all create an effective dynamic.

Level 3—Changing Settings

This is the movement created when you change settings during the mix, when you change the volume, panning, EQ, or effects during the actual recording of the mix to a stereo deck. It is the most intense of the three levels and can overwhelm the song, becoming the sole focus of attention at that moment. Therefore, this level of dynamic is only used when it is appropriate for the style of music or song (and when the band will let you).

In certain styles of music, the mix should be invisible, or transparent. For example, if you can hear the mix with big band music, acoustic jazz, or bluegrass, it only gets in the way. The mix should let the music show through.

However, in other styles of music, the dynamics created with the mix actually act as a musical component of the song. The mix itself becomes part of the song. Pink Floyd has, of course, taken this to the extreme with quadraphonic concerts. Rap, hip hop, and techno music also commonly utilize the mix as if it is another instrument in the song. Let's look at the four control room tools—volume, EQ, panning, and effects—and the three levels of dynamics for each.

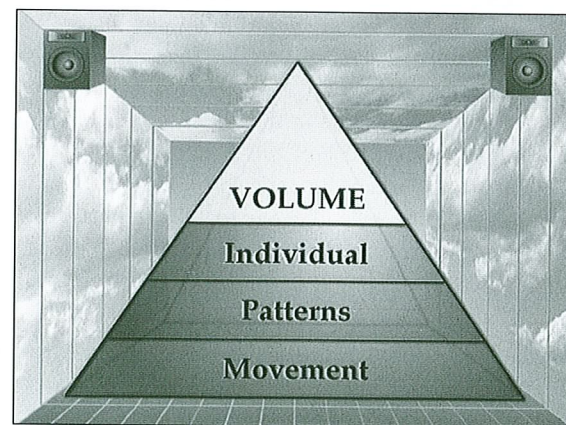


Visual 128. Pyramid of Tools and Dynamics (and Outline of This Chapter)
(see color Visual 128C)

I'll begin with volume.

SECTION A

Volume Control Dynamics



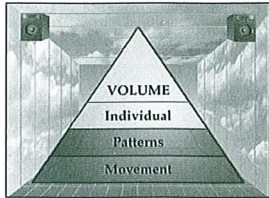
You can create musical and emotional dynamics by placing each instrument at different volume levels in a mix. Simply making a sound louder or softer affects how it is perceived. However, you create a much more intense dynamic when all of the volume controls create a pattern based on their collective placement. For example, if all of the volumes are set evenly, so that there is very little variation between the loudest and softest sounds, the mix will be quite different from one with a wide variation in volume levels. When you

change the volume levels during a mix, it creates a level of dynamic that is often so strong it draws the listener's attention away from the song, which could be cool if it's appropriate for the style of music and song.

Now, I'll go into more detail about each of the three levels of dynamics that can be created with volume settings.

FADER VOLUME LEVELS

Level 1 Dynamics: Individual Volume Placement and Relative Settings



You can create a wide range of emotional and musical dynamics depending on how you set the faders on the console. The first and most basic level of dynamics is based on where you place the volume of each sound in relation to the other sounds in the mix. For example, if you place a vocal loud and out front in the mix, it will sound completely different than if it is placed back in the mix and softer.

The musical dynamics that can be created with volume placement are much more complex than most people imagine. Many people think of balancing the volume of sounds as making them even in volume. However, normally, we don't want all of the instruments to be the same volume. We usually want one instrument to be a bit louder than another, some in the foreground, some in the background, some in between.

Every instrument has its own traditional volume level based on the style of music and the details of the song. In many types of music, these levels have become strictly set. For example, the volume levels for

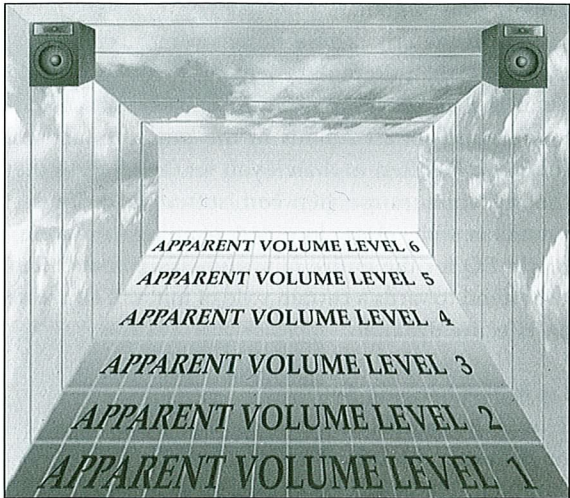
1	2	3	4	5	6
Alarm Clocks	Lead Vocals	Main Rhythm	Rhythm Beds	Effects	Whispers
Explosions	Lead Inst's	Lead Vocal	Chordal Pads	Kick (Jazz)	Talking
Primal Screams	Boom	Toms	Drums (Jazz)	Hums	Noises
	Horn Blasts	Snare (Dance)	Bckgrd Vocals	Bckgrd Vocals	Doubling
	Symph Blasts	Kick (Metal)	Strings		
		Hi-Hat (Jazz)	Reverb		
		Loud Effects			

big band, jazz, and even country have very little leeway. On the other hand, the set levels in rap and hip hop are much looser (although certainly some rap and hip hop artists have their own strict ideas as to

where each level should be).

Let's explore these traditional levels in volume placement for each instrument. We'll begin by setting up a scale for the volume levels that different instruments are placed at in a mix.

If we think of volume in decibels, based on sound pressure level, then a sound could be set at over 140 different volume levels in a mix. But in order to make this wide range of levels more manageable, I'll divide them into six different levels, where 1 is the loudest and 6 is the softest.



Visual 129. 6 Apparent Volume Levels (see color Visual 129C)

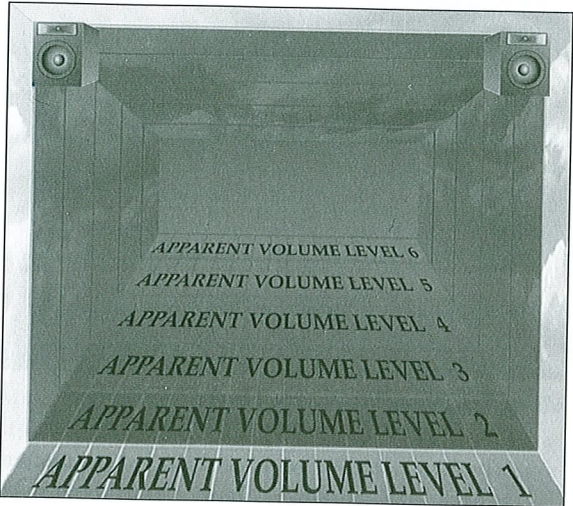
Remember that we are discussing relative apparent volumes. The apparent volume of a sound is also dependent on the waveform of a sound. For example, a chainsaw sounds louder to our ear than a flute, even if they are both at the exact same volume. The apparent volume is the level that sounds seem to be to our ear.

Chart 11. 6 Ranges of Apparent Volume Levels With Typical Instruments in Each Level

RANGES OF APPARENT VOLUME LEVELS

Apparent Volume Level 1

Sounds at this volume are shockingly loud. In fact, it is quite rare and unusual to place sounds at this level. Commonly, only sounds that are very short in duration are this loud. If a normal instrument is placed at this level, it is usually thought of as either being wrong or extremely creative. The alarm clocks in "Time" from *Dark Side of the Moon* by Pink Floyd are an example of interesting Level 1 sounds. Explosions, primal screams, and other special effects might also be this loud.

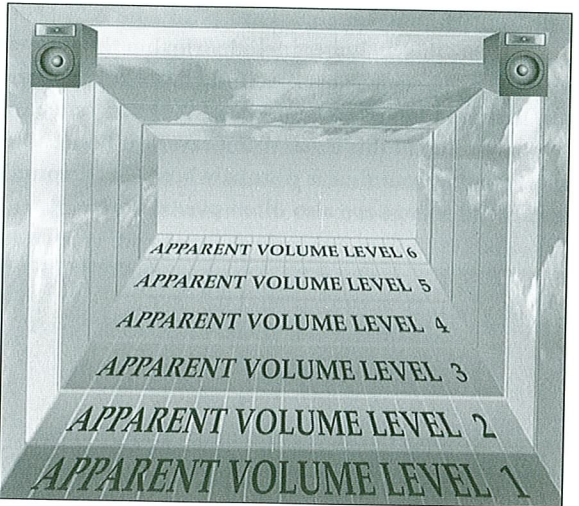


Visual 130. Apparent Volume Level 1 Highlighted

Apparent Volume Level 2

The primary sounds at this volume are vocals and lead instruments used for music in which the vocals or lyrics are the main focus of attention, such as big band, middle-of-the-road, or for vocals, like those of Bob Dylan, Janis Joplin, Mariah Carey, etc. In many types of rock 'n' roll, the vocals are placed much lower in the mix.

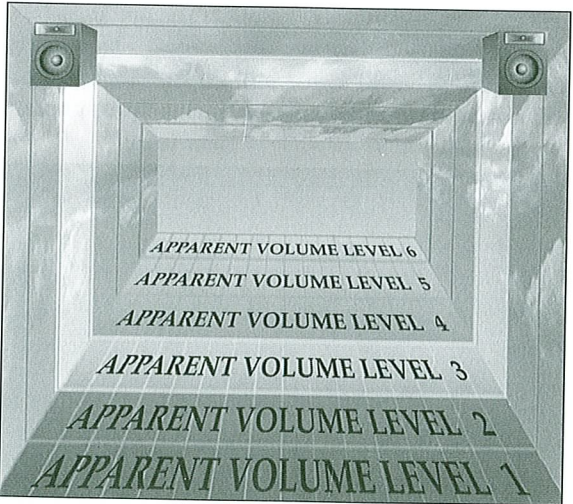
If a song has a great lead instrument player, that instrument is often placed at this level in the mix. You might also find the boom in rap music or the kick drums or toms in heavy metal at this level. Horn blasts in big band music and symphony blasts in classical music are often set at this level.



Visual 131. Apparent Volume Level 2 Highlighted

Apparent Volume Level 3

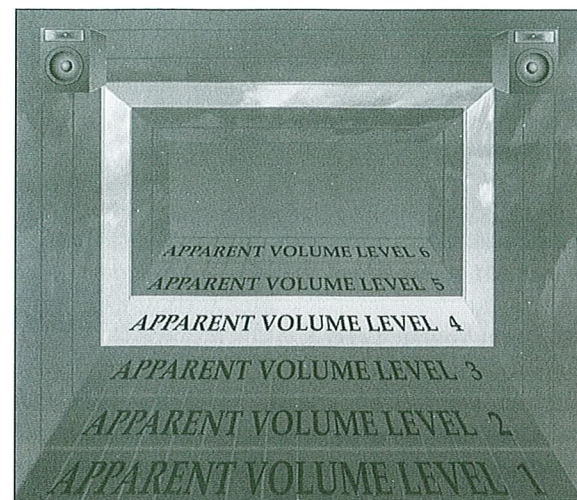
Sounds at this level consist of primary rhythm parts, such as drums, bass, guitar, and keyboards. Lead vocals in a lot of rock 'n' roll are also at this level when set back in the music. Other examples include kick drums in most heavy metal, snare drums in most dance music, and toms and cymbals in almost all styles of music. Hi-hat is only occasionally at this level, although jazz and dance music often place it here. Phil Collins was probably the first person to place reverb on the drums this loud.



Visual 132. Apparent Volume Level 3 Highlighted

Apparent Volume Level 4

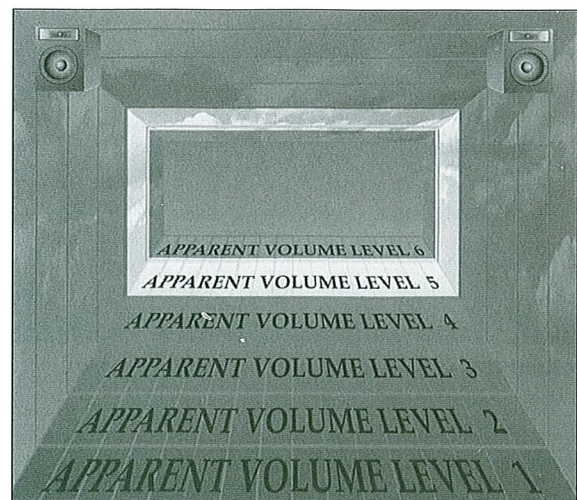
Sounds at this volume include rhythm beds and chordal pads, such as background piano, keys, or guitar. Drums in lots of jazz, middle-of-the-road, and easy rock are often at this level. When reverb is noticeable as a separate sound, it is normally here. Background vocals and strings are also often placed here.



Visual 133. Apparent Volume Level 4 Highlighted

Apparent Volume Level 5

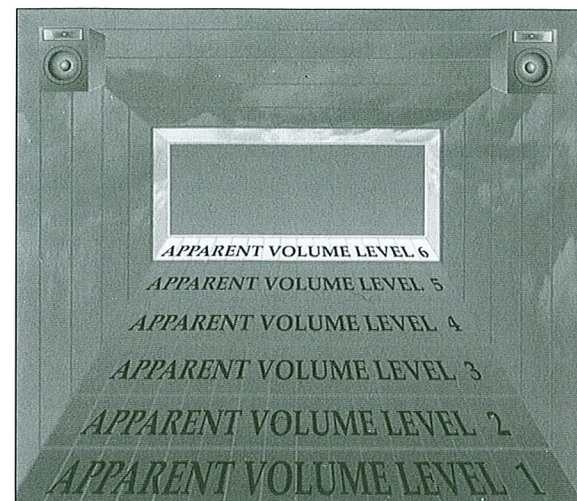
Sounds at this level include the kick drum in jazz and big band music. Lots of effects and reverb are often placed here, so that they can only be heard if you listen closely. Background vocals are sometimes relegated to this level. Other instruments placed here function only to fill in the mix because their images will not be clear and defined at such a low volume.



Visual 134. Apparent Volume Level 5 Highlighted

Apparent Volume Level 6

Sounds placed this far back in the mix are so soft that they are hard to detect. Pink Floyd is well known for adding little whispers or almost subliminal sounds to draw you into the mix. Sounds at this level can be very effective, but it is important that they serve to add to the overall mix in some way. If these sounds do not fit just right, they might be perceived as noise.



Visual 135. Apparent Volume Level 6 Highlighted

These are the instruments that we most often find at each level. However, I have placed them here only to outline and explain the scale of six volume ranges. Actual instrument levels vary depending on the style of music, song, and the musicians.

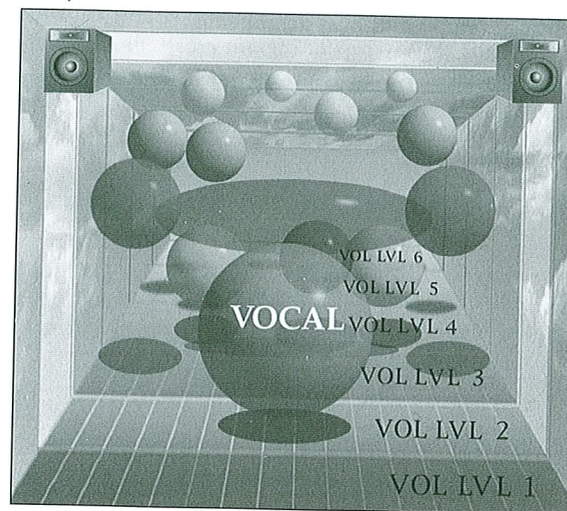
VOCALS

Let's take a look at various examples of vocals placed at different levels in the mix. Depending on the style of music, the song, and how much the singer likes his or her own voice, lead vocals normally vary between levels 2 and 4 (although a capella music puts them at level 1).

Apparent Volume Level 2

We commonly find vocals at level 2 in opera and middle-of-the-road music, like Barry Manilow and Frank Sinatra. Some folk, big band, and country music also put the vocals right out front. Besides the style of music, the details of the song also affect the level placement. If the lyrics are the main focus in the music (Bob Dylan) or the singer is phenomenal (Janis Joplin, Steve Winwood, Al Jarreau, Bobby McFerrin), then the vocals might be brought out

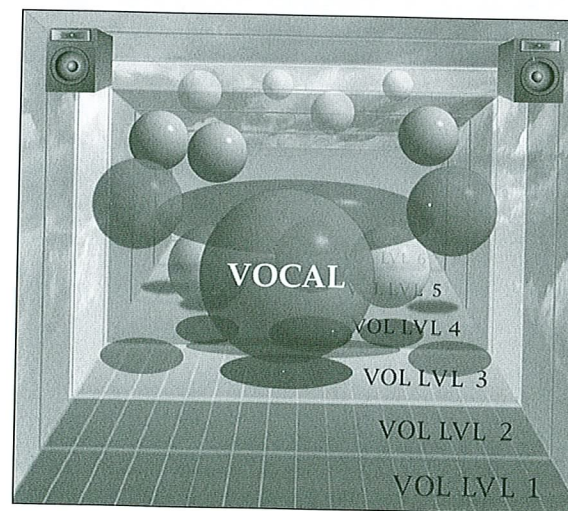
front. Also, the denser the arrangement, the lower the vocals are placed in the mix, so that the details within the arrangement won't be dwarfed by the vocals. Loud vocals can make the rest of the mix sound wimpy.



Visual 136. Apparent Volume Level 2 Vocals (see color Visual 136C)

Apparent Volume Level 3

Most vocals are mixed at level 3: laid back in the mix but still loud enough to understand what they are saying. Vocals at this level are also not so loud that they dwarf the rest of the mix.



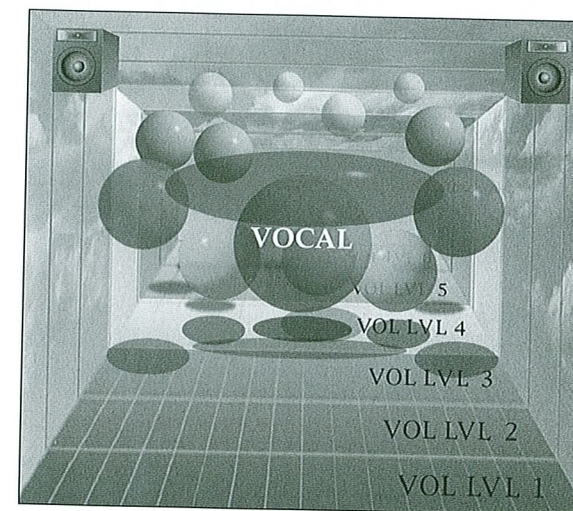
Visual 137. Apparent Volume Level 3 Vocals

Apparent Volume Level 4

Vocals at this level are so low that you normally can't understand the lyrics. As Mom would say, "How can you understand what they're saying?" "You read the lyrics in the liner notes, Mom." A good amount of rock 'n' roll, especially certain types of alternative

rock, like Smashing Pumpkins and Pearl Jam, have vocals this low in the mix. Pink Floyd also often has vocals at level 4. The lyrics (or vocal sounds) of Enya might be considered to be at level 5.

Besides the style of music, probably the most common reason for placing vocals at this level is so that they blend better with the music, therefore, not obscuring the overall rhythm and melody of the song. I have also heard clients say that if the listener has to work harder to hear what the lyrics are saying, then they will have more meaning. Possibly true, if you can understand the lyrics at all. Finally, if the lyrics are really bad or they just don't turn you on, you normally don't put them right out front. But, you never know when it comes to lyrics—it takes all types for the world to go 'round.



Visual 138. Apparent Volume Level 4 Vocals (see color Visual 138C)

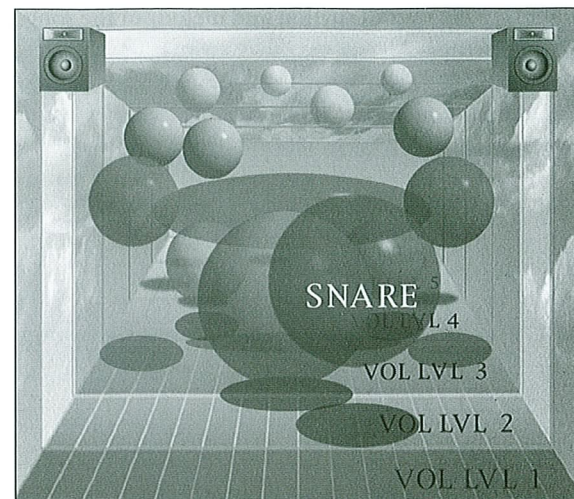
SNARE

The volume that a snare is placed in a mix is dependent on the style of music, the song, and the minds of the band members just as with vocals. The volume level of the snare, which seems to vary between levels 2 and 5, has progressed up the scale over the years. Rock 'n' roll was probably responsible for raising the level of the snare an entire level, then, in the 1960s, dance music and disco helped to raise the level of the snare another level.

Apparent Volume Level 2

Various forms of rock (some Led Zeppelin and Bruce Springsteen) have the snare this far out front in a mix. But don't confuse a large amount of reverb on a snare with being a loud snare. Often a snare that was played loudly with lots of reverb is actually placed very low in volume. Normally, a snare is only this loud if it sounds very good and is complex. A loud snare

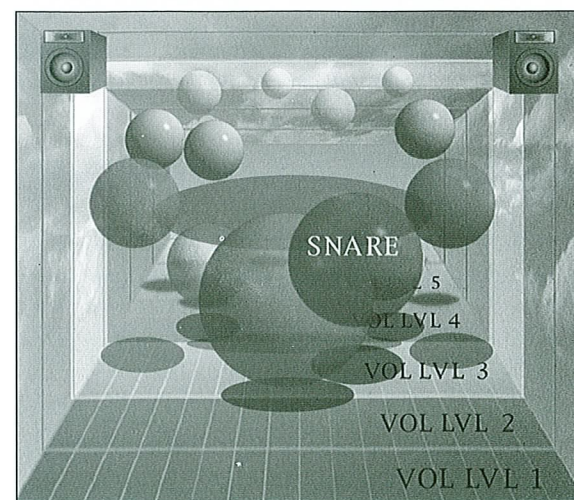
that has a simple sound and is also irritating would probably get on your nerves. Of course, there are those who might like this! Also, a snare is usually only placed at this level when the tempo is slower, leaving more room in the mix. This is probably because when it is this loud, it takes up a lot of space in the mix.



Visual 139. Apparent Volume Level 2 Snare (see color Visual 139C)

Apparent Volume Level 3

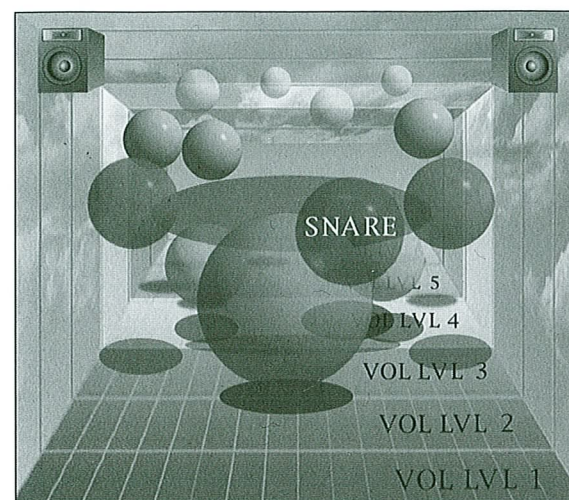
This level is most common for rock 'n' roll. The snare is at this level for many styles of music, including heavy metal, blues, and now, even country.



Visual 140. Apparent Volume Level 3 Snare

Apparent Volume Level 4

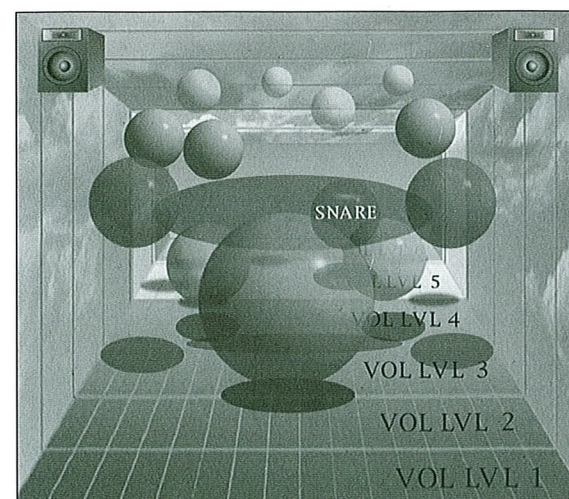
Big band, easy rock, new age, and '50s and '60s rock music often have the snare mixed this low. Most ballads will place the snare at this level, though there are some ballads that have a massive snare as loud as level 2. Hip hop will often have the snare this low because of its fast tempo and busy arrangements.



Visual 141. Apparent Volume Level 4 Snare (see color Visual 141C)

Apparent Volume Level 5

Big band music sometimes has the snare this low.



Visual 142. Apparent Volume Level 5 Snare

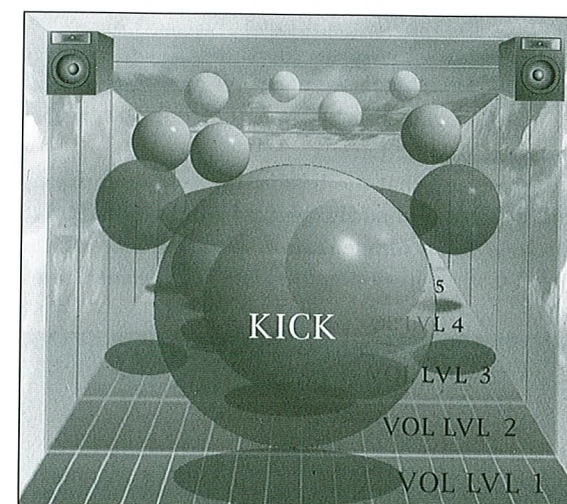
Some general rules (to be broken) include: The better the snare sound, the louder it is placed in the mix; the slower the tempo, the louder the snare; and the busier the arrangement, the lower the snare.

KICK DRUM

Again, the style of music will be the biggest influence in the volume in the mix. Kick drums tend to span levels 2 to 5. It has also been making its way up the volume scale throughout history, probably suppressed for years because it was considered to be the beat of the devil. Of course, rock brought it up one level. Then, heavy metal was responsible for raising it another level. Then, rap and hip hop came along and put it off the scale. Now, we find the kick drum at extremely loud levels in all kinds of modern music. Even Peter Gabriel has a rap boom on the album *Us*.

Apparent Volume Level 1

Rarely is a kick drum ever this loud; however, if we think of the 808 rap boom as a kick drum, then we do sometimes see it here.

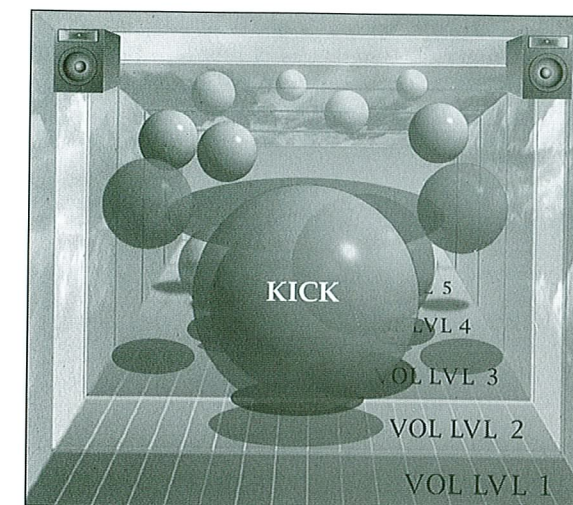


Visual 143. Apparent Volume Level 1 Kick (see color Visual 143C)

Apparent Volume Level 2

Rap booms are at this level, as is the primary kick in hip hop and house music. The kick drum in heavy metal is sometimes at this level, though it is usually raised to this level for only a short period of time in certain sections of the song. Occasionally a ballad will even have the kick at this level, and engineers have been known to make the kick this loud in blues and reggae.

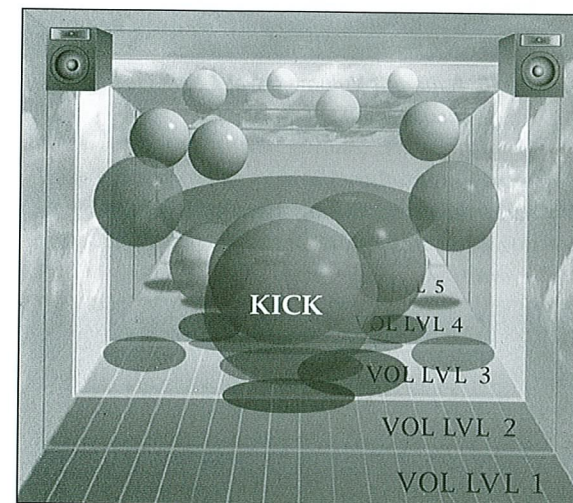
When at this level, you should always take into consideration that such a loud, low-frequency sound takes up a huge amount of space in the mix. Therefore, you need to calculate just how much room there is for it and decide whether it should be so prominent.



Visual 144. Apparent Volume Level 2 Kick

Apparent Volume Level 3

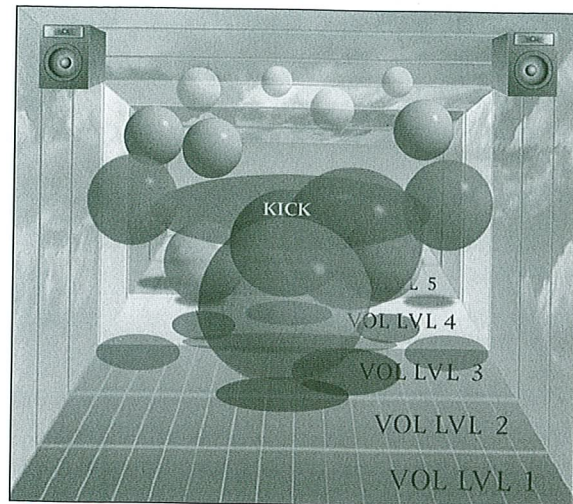
This is the most common level for the kick in most styles of music, especially rock, blues, jazz, and country.



Visual 145. Apparent Volume Level 3 Kick

Apparent Volume Level 4

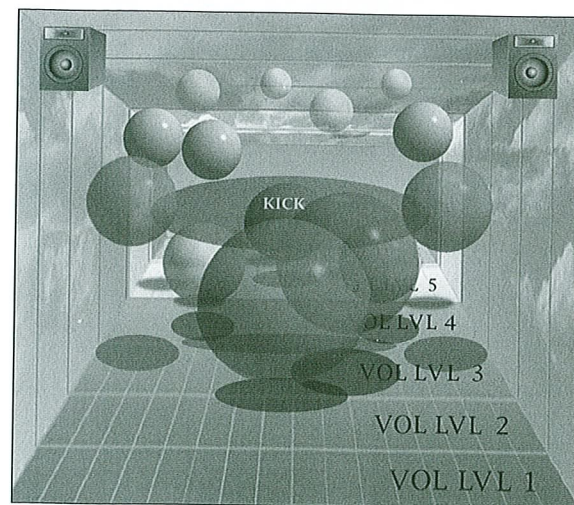
Jazz and new age, as well as a lot of ballads, commonly have the kick at this level. It is interesting that much of Jimi Hendrix's music was mixed with the kick drum down around level 4, so that you could hardly hear it. Of course, this was common in many songs and styles of music in the '60s.



Visual 146. Apparent Volume Level 4 Kick (see color Visual 146C)

Apparent Volume Level 5

Big band music commonly has the level of the kick down this low in the mix.



Visual 147. Apparent Volume Level 5 Kick

Just like the snare drum, the kick drum volume is primarily based on the style of music. However, both the song and the particular instrument sounds also contribute to this decision. The more interesting and complex the kick sound, the louder it usually is in the mix. The slower the tempo, the louder the kick. The busier the arrangement, the lower the kick.

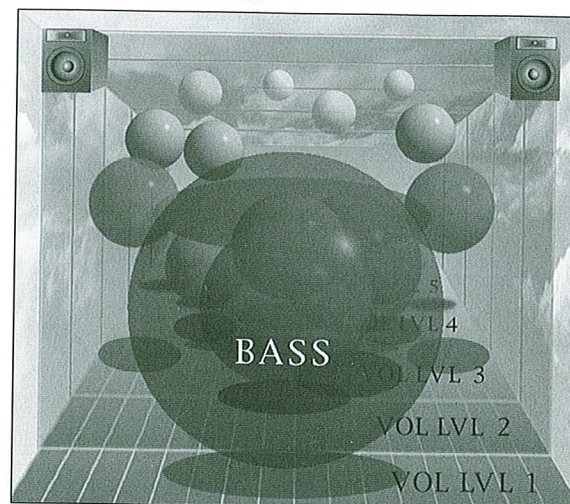
BASS GUITAR

The bass guitar normally spans levels 1 to 4. Because it takes up so much space in a mix, it is often placed lower in the mix, so it doesn't mask the other instruments too much.

With the evolution of rock and then disco, the bass has crept up the volume scale. Then rap began a revolution that not only helped raise the level of bass guitars in mixes, but resulted in a change in the hardware we use. When you go to a stereo store, you see things like Mega Bass and boom boxes. And normal home stereos are now capable of handling a lot more bass than before.

Apparent Volume Level 1

It is quite rare that the bass is this loud, even in rap and hip hop. Ordinarily, the bass is only turned up to this level for a moment in a special section of the song.



Visual 148. Apparent Volume Level 1 Bass (see color Visual 148C)

Apparent Volume Level 2

Reggae and the blues often have the bass this loud. Because the bass is carrying the song in blues, it is often needed to help fill out the sparse arrangements commonly found in these mixes. When the bass is a lead part in the song or music, it is often right out

front at this level. This is often the case in jazz, especially if the bass guitar is a fretless. Primus and Stanley Clarke are good examples of the bass played at this level.



Visual 149. Apparent Volume Level 2 Bass

Apparent Volume Level 3

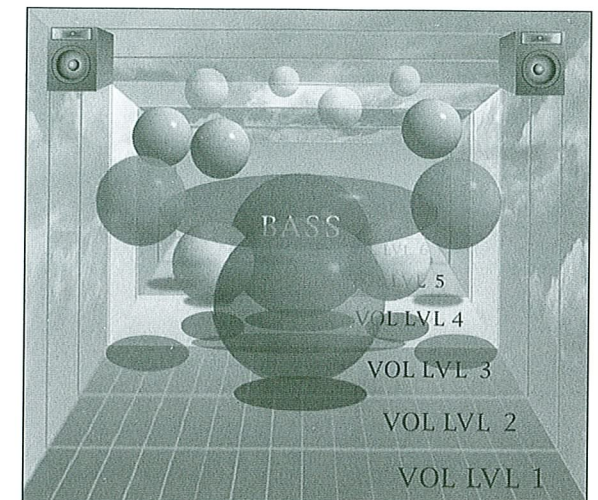
This is the most common level for the bass guitar for most styles of music: not so loud that it takes up too much space, but loud enough to still be heard well.



Visual 150. Apparent Volume Level 3 Bass (see color Visual 150C)

Apparent Volume Level 4

The bass guitar in a good amount of rock 'n' roll is down at this level, so it doesn't get in the way. In big band music, you often find the bass here. In fact, when you have a standup or acoustic bass, it often ends up here.



Visual 151. Apparent Volume Level 4 Bass

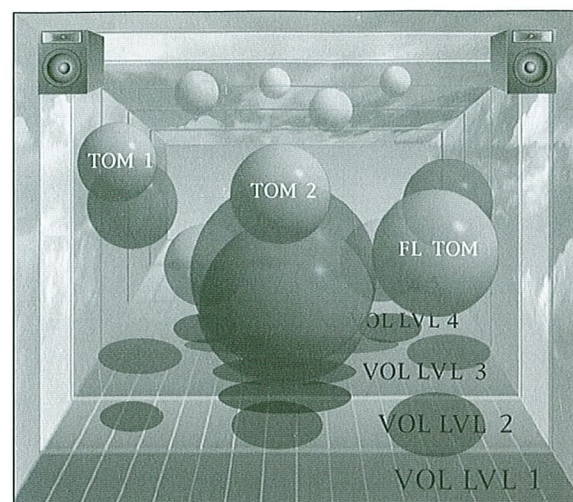
Commonly, the fewer instruments in a mix, the louder the bass because you need something to fill out the space between the speakers. Also, if you have a lot of instruments, there just isn't enough room for the bass guitar, and it will mask the other sounds if too loud.

TOM TOMS

Toms span the entire volume scale from 1 to 6. Although somewhat dependent on the style of music, the details of the song and the preferences of the engineer and band seem to be the most common determinants of tom levels. The brightness of the toms in the mix makes a huge difference as to how much they are masked by the rest of the mix.

Apparent Volume Level 2

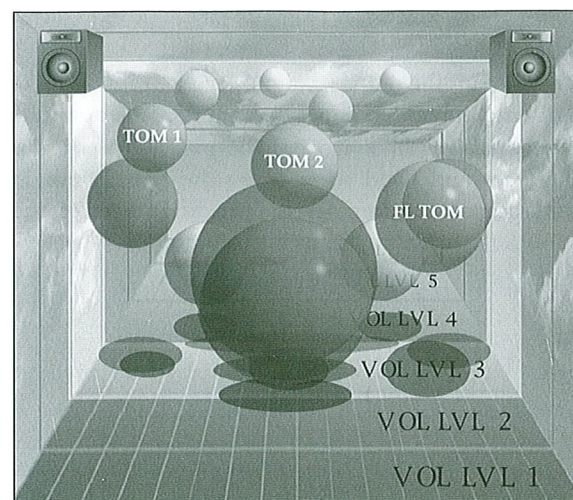
Toms are sometimes placed this loud because their duration is so short and they are played so sparsely. When sounds don't last very long, they can be turned up louder: They're gone before you know it. Also, because toms are not so edgy, they are often boosted more than you would think. Generally, the more they are played in the song, the lower toms tend to be placed in the mix.



Visual 152. Apparent Volume Level 2 Toms (see color Visual 152C)

Apparent Volume Level 3

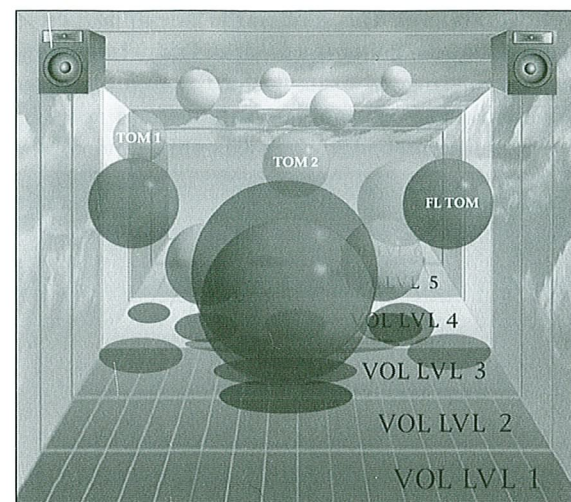
This is the most common level for toms in most styles of music: present, but not so loud that they break up the beat or rhythm of the song too much.



Visual 153. Apparent Volume Level 3 Toms

Apparent Volume Level 4

Toms are normally not very loud in most types of music, somewhere around level 4. This might have to do with the problem of cymbals bleeding into the tom mics. When this happens, the sound of the cymbals in the tom mics is irritating because the sound is reflecting off the tom heads. I think engineers won't usually turn the toms up very loud because it makes the cymbals sound so horrendous, especially if the toms need to be brightened a lot with EQ, and so they don't interrupt the flow of the song rhythm too much.



Visual 154. Apparent Volume Level 4 Toms (see color Visual 154C)

Apparent Volume Levels 5 and 6

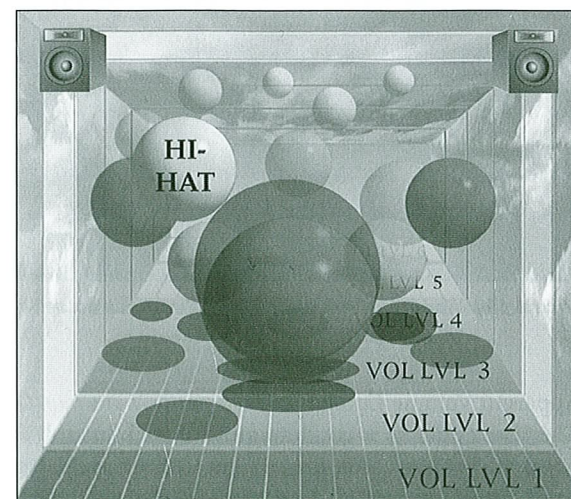
I wouldn't doubt that engineers who mix toms at levels 5 or 6 either don't like the tom parts, don't like toms in the first place, or forgot about them.

HI-HAT

The level of the hi-hat depends mostly on the style of music, although the details of the song often make a big difference, too. They normally fluctuate between levels 2 and 5.

Apparent Volume Level 2

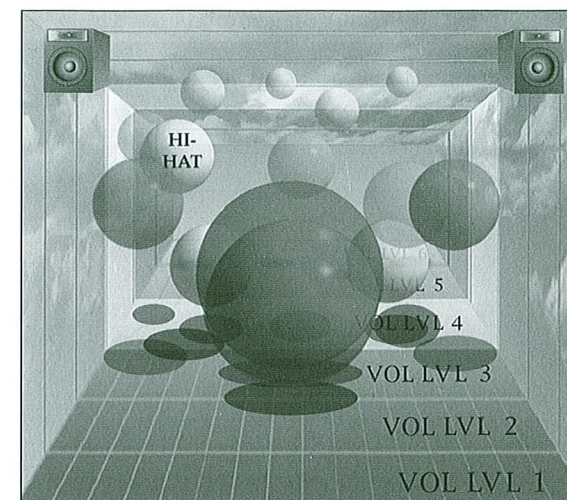
Hi-hats are normally the loudest in heavy metal and R&B music. Hip hop and jazz often place it at this level as well.



Visual 155. Apparent Volume Level 2 Hi-Hat (see color Visual 155C)

Apparent Volume Level 3 and 4

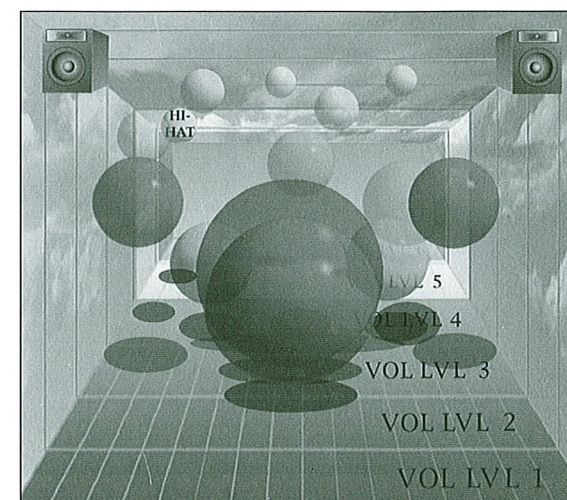
Hi-hats commonly fluctuate between these two levels for most styles of music, especially rock 'n' roll.



Visual 156. Apparent Volume Level 4 Hi-Hat

Apparent Volume Level 5

Although the hi-hat doesn't take up much space in a mix, it does cut through well. Not only is it an edgy type of sound, but it also resides in a frequency range with very few other instruments. Therefore, even when placed low in the mix, it can still be heard just fine.



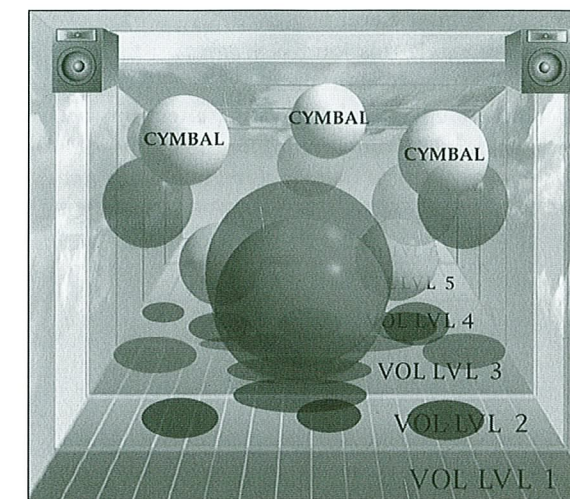
Visual 157. Apparent Volume Level 5 Hi-Hat (see color Visual 157C)

CYMBALS

Cymbals range the entire gamut, from 1-6. The style of music makes a difference, but even more importantly, the particular sound of the cymbals and the parts being played in the song tend to affect the level the most. However, it is the preferences of the engineer and the band that often determine final levels.

Apparent Volume Level 2

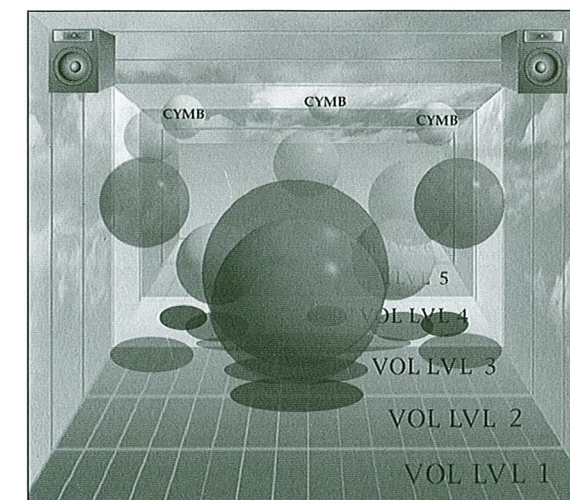
It isn't too often that cymbals are at this level, although Led Zeppelin and Creedence Clearwater Revival placed them this loud occasionally.



Visual 158. Apparent Volume Level 2 Cymbals (see color Visual 158C)

Apparent Volume Level 3 and 4

Most cymbals are set at these levels, so that they are evident but still blend in with the rest of the instruments in the song.



Visual 159. Apparent Volume Level 4 Cymbals (see color Visual 159C)

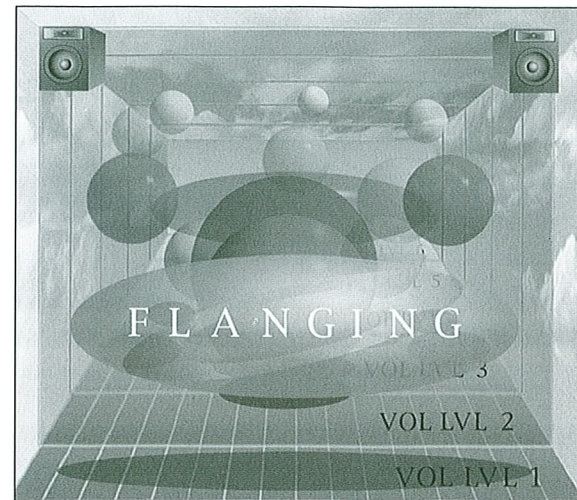
Cymbals at levels 5 or 6 are often there because of their sound or masking from other sounds in the mix.

EFFECTS

The volume of different effects varies widely over the level spectrum. Reverb, for example, has progressed up the scale over the years.

Apparent Volume Level 1

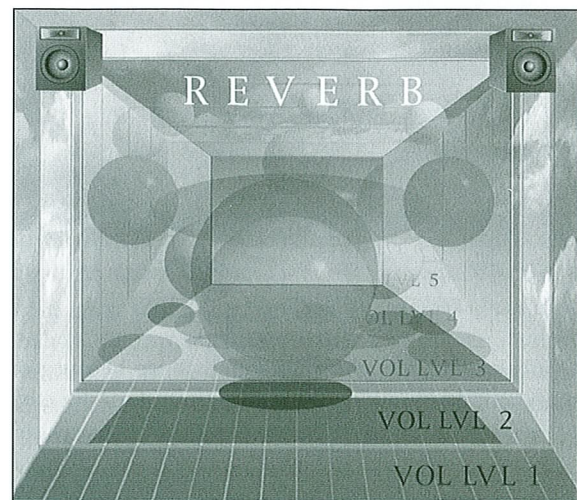
Effects are rarely this loud in a mix, usually only if they are extremely short in duration. They can be shocking enough to have a lasting effect on the listener, longer than the duration of the sound itself.



Visual 160. Apparent Volume Level 1 Effects (see color Visual 160C)

Apparent Volume Level 2

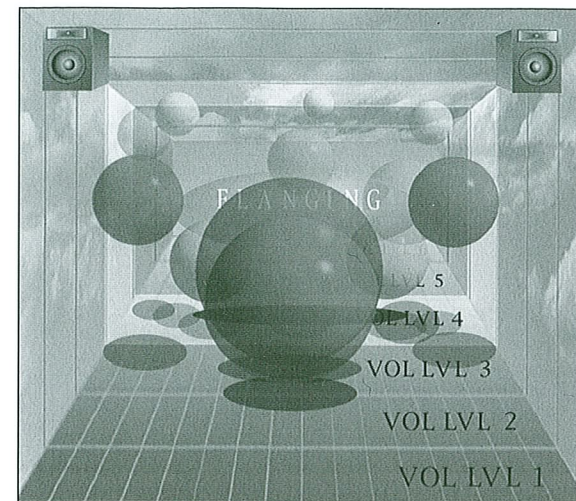
Reverb is occasionally this loud on a snare drum, depending on the song and style of music. Delays are often the same level as the sound it's on. For example, a lead guitar or vocal might easily have a delay this loud. Flange-type effects are also sometimes at this level.



Visual 161. Apparent Volume Level 2 Effects (see color Visual 161C)

Apparent Volume Levels 3 and 4

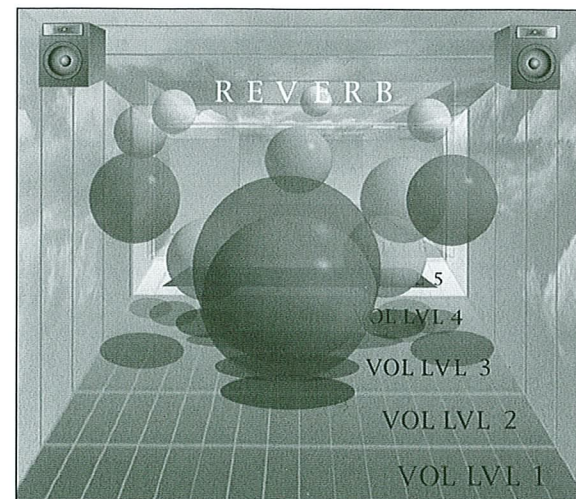
Most effects are placed at this level: loud enough to hear the detail within the effect, but not so loud that it overwhelms other sounds in the mix.



Visual 162. Apparent Volume Level 4 Effects (see color Visual 162C)

Apparent Volume Level 5

Reverb is often at this level and is quite unnoticeable to most listeners.



Visual 163. Apparent Volume Level 5 Effects (see color Visual 163C)

OTHER INSTRUMENTS

We have covered only the most common instruments found in recordings. There are, of course, a huge number of other instruments. You should note the level of each and every instrument in the music you listen to.

SUMMARY

As you can see, there is an incredible variety of musical dynamics based on the level that you set each sound in the mix. This is important because so many bands want their mixes to sound like they traditionally do for their style of music.

When bands complain that the mix doesn't sound quite right, but they don't know why, it is often as simple as an instrument being placed at the wrong volume. It seems that most engineers will start changing EQs and effects to try to please the band, but it might actually be that the rhythm guitar is too loud compared to the vocals, or the kick drum is the wrong volume compared to the bass guitar.

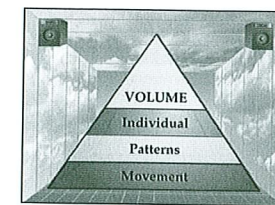
I have only provided examples of common styles of music and songs. The details of each instrument level for each style of music and song are as detailed as people themselves. And after you throw in the values of the band, the engineer, and everyone else involved, every project has further variations. It is this level of uniqueness that makes being a recording engineer such a joy. You are never bored.

Now that you know this scale (1-6), start checking out the relative level of every sound in every song. Most importantly, for each sound, ask yourself these three questions: Why might the engineer have put it at the level it's at? Do I like it there? Would I have put it there?

As you now know, there are a number of reasons for the placement of volume levels based on the type of music, the song, and the people involved. See if you can guess why the engineer might have placed it where he or she did. At first, you may not have any preferences. But if you simply pay attention to the level of each sound, after awhile you will develop your own values and you will know exactly where you like the levels of different instrument sounds for various styles of music and songs. Then, when you go into the studio, you'll no longer be unsure about exact levels; you'll know exactly where you want the volume of each sound.

The next step is to begin differentiating between finer and finer levels of volume, so that you can see more than just six levels: Twelve levels is cool, but twenty-four is incredible.

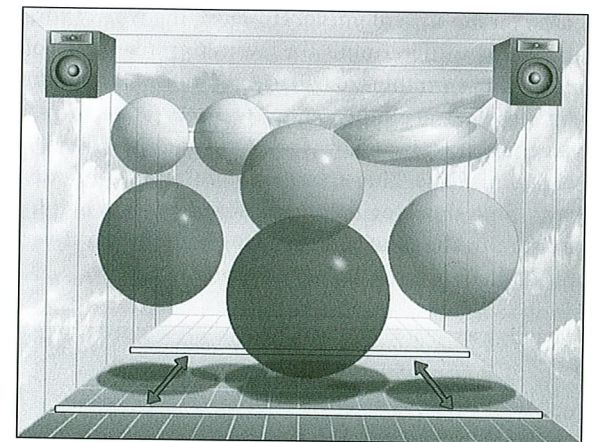
Level 2 Dynamics: Patterns in Volume Placement



Compared to the individual volume levels of an instrument, combined levels created by the overall relationships of the volume levels are more emotionally and musically dynamic. I call these volume patterns.

Certain styles of music have developed their own traditional levels of how even or uneven the overall volumes are set. And again, certain styles of music have stricter rules than others. It is important to get to know these traditional levels, so you can push the limits of creativity and change the world.

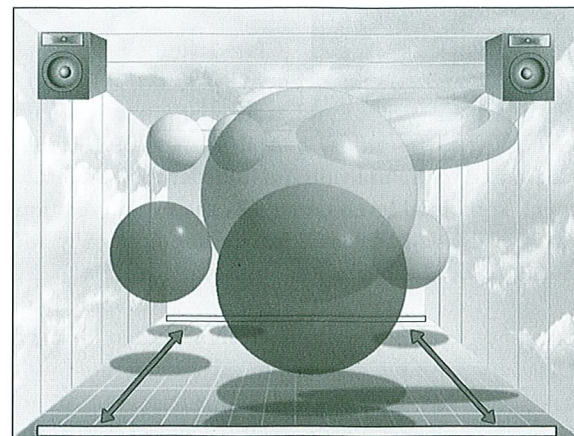
In some styles of mixes, the volumes are set evenly so that there is very little variation between the loudest and softest sounds. New age music, alternative rock (Tears for Fears, REM, Smashing Pumpkins, Nine Inch Nails, etc.), middle-of-the-road music, country music, and easy rock are often mixed with very little variation in volumes. You could say that Muzak is the extreme example. Even volumes might also be appropriate for a love song.



Visual 164. Song With Even Volumes (see color Visual 42C)

Sometimes, it is necessary to compress sounds a bit more to help make the volumes more even. However, you can only compress things so much before they sound squashed. Often it becomes necessary to "ride" (move) the faders up and down in volume to keep things even. However, because this actually means moving the faders, I will deal with this more in the next section on "Changing Volumes."

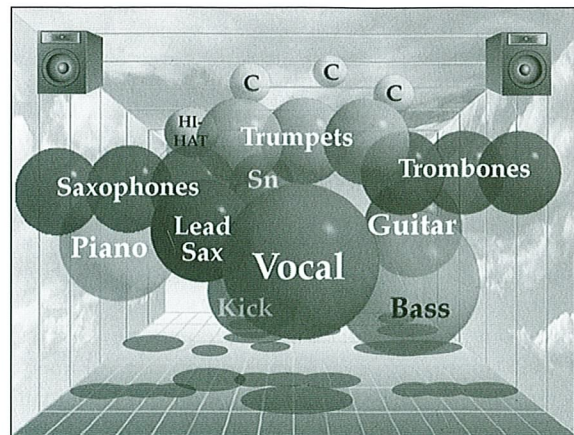
Alternatively, some styles of music are mixed with extreme variations between the softest and loudest sounds, like this:



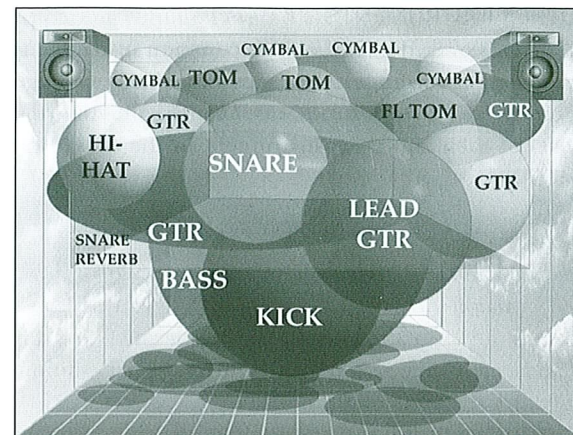
Visual 165. Song With Uneven Volumes (see color Visual 43C)

Lots of rock 'n' roll, dance music, and rap are mixed this way. Big band music is also a perfect example of this type of mix. You might have extremely soft sounds followed by huge horn blasts. Even some classical music is this dynamic. Pink Floyd is well known for trying to shock you to death with alarm clocks and explosions. It can be quite fun and exhilarating.

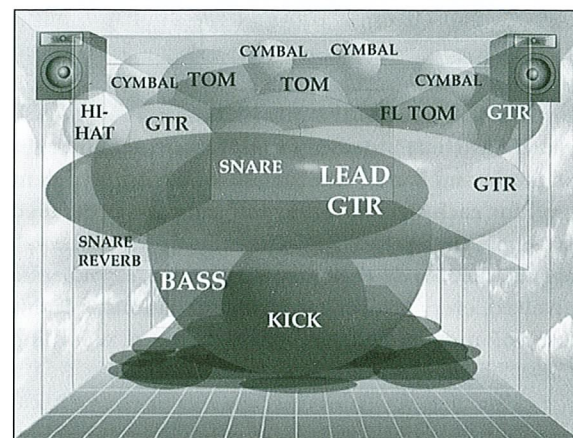
Whether the mix is even or uneven is mostly based on the style of music. However, the type of song also helps to determine the overall evenness of volumes. For example, a ballad might be mixed with volumes that are more equal to each other to preserve the overall mellow feel. On the other hand, a song about "shocking changes in life" might very well have some shocking volume differences. It is helpful to listen to the details of the song to help you determine whether levels should be even or uneven.



Visual 166. Uneven Volumes: Big Band Mix (see color Visual 166C)

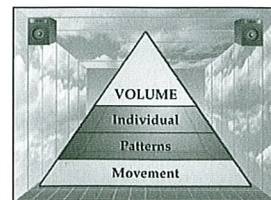


Visual 167. Even Volumes: Heavy Metal Mix (see color Visual 167C)



Visual 168. Even Volumes: Alternative Rock Mix (see color Visual 168C)

Level 3 Dynamics: Changing Volume Levels



Volume can range from soft to loud, and individual sounds can also be raised or lowered within the song. When faders are moved while a sound is playing, the dynamic created tends to be intense. If the level of a sound is changed at a good transition point, such as the beginning of a chorus or lead break, the dynamic created is not nearly as intense as when changed in the middle of a section. Such a strong dynamic often causes the listener to focus on the change you are making. Therefore, it should be done as musically as possible—that is, in time with the tempo or other changes that are occurring in the song.

The volume of the entire mix can also be raised or lowered. The master stereo fader volumes are not commonly changed except at the beginning or end of the song. Fading in the entire mix at the beginning of a song creates a very nice and smooth dynamic; The Beatles used this on "Eight Days a Week." I've also heard songs where the entire mix is faded out, faded back in, faded out again, and faded in one more time. A very cool effect is to cut, boost, or gradually fade the overall volume in the middle of a song. Such dynamics can be quite effective. Fading out a particular section of instruments (such as drums) and then fading it back in can also serve to wake people up.

In addition to moving a fader to create volume dynamics, you will usually need to adjust levels to keep the volumes even. Compressor/limiters can only do so much before they make a sound unnatural. Therefore, you can create another dynamic—to actually even out volumes more—by riding the faders throughout the mix.

If you bring a sound out front by turning the volume up at the beginning of the song, it will now be clear in our brain for the rest of the song, even if it is set back in volume in the mix. Because of this, you can create a special psychoacoustic effect by bringing up and highlighting a different sound in the mix, then turning it down. If you keep doing this, you create the illusion that all sounds in the mix are loud and clear. However, if someone were to walk into the room in the middle of the song, they probably would not agree.

Although changing levels in a mix can create a major dynamic, you can create much more subtle (and often more effective) dynamics by making minor volume changes in various sections of a song. For example, you might boost the volume of the guitars (ever so slightly) in the chorus, raise the snare and snare reverb ever so slightly in the lead break, then bring up the bass guitar and kick drum (again, just a touch) in the vamp at the end of the song. These subtle volume changes can add serious magic to your mix.

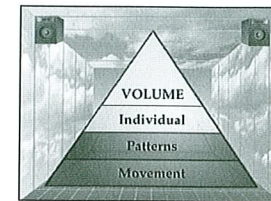
These three levels of dynamics—volume placement, volume patterns, and volume movement—make up all that can be done with volume faders in a mix.

COMPRESSOR/LIMITERS

Just as volume faders can create a wide range of dynamics, compressor/limiters can also be used to create musical dynamics to fit the music or song. Compressor/limiters are often used for technical reasons, such as to get a better signal-to-noise ratio (less hiss). However, this section covers how they are used

to create a musical or emotional component like another instrument in the mix.

Level 1 Dynamics: Individual Compressor/Limiter Placement and Relative Settings



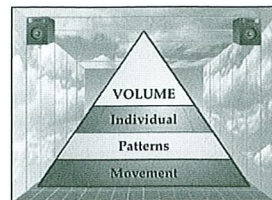
Sounds are compressed based on the dynamic range of the sound itself. For example, a "screamer"-type vocal (Aretha Franklin, Axl Rose, Janis Joplin, Pavarotti) will normally be compressed more to account for the huge difference in volume from soft to loud. However, there are certain sounds that are compressed more out of traditions that have developed over years of recording and mixing.

First, most acoustic instrument sounds are compressed. Vocals and bass guitar are almost always compressed. Many engineers will compress the kick drum for presence, although there are some who do not believe in compressing the kick. If the drummer is good and has control of the volume of each kick lick, then compression may not be necessary. However, compression does make the attack of the kick drum sharper.

Many instruments are only compressed when they are placed in a mix (as opposed to being solo). For example, it is rare for anyone to compress a solo piano; however, pianos are commonly compressed when placed in a mix, especially a busy one. Acoustic guitars are also commonly compressed in a mix. In fact, as mentioned before, the busier the mix, the more the individual sounds are compressed. This is done in order to minimize the huge amount of movement by the natural fluctuations in volume of each sound. We can only handle so much stimuli before we start to flip out.

It is also common to compress the loudest and softest sounds in a mix more than other sounds. This is because there are certain limits as to how loud a sound can be in a mix before it sounds "wrong." Likewise, if a sound is too low in a mix, it simply will not be heard. Lead guitars are often compressed more, simply because some people like the intensity and power of an electric guitar right in their face. Remember, one of the primary functions of a compressor/limiter is to make a sound more present.

Level 2 Dynamics: Patterns of Compressor/Limiter Placement



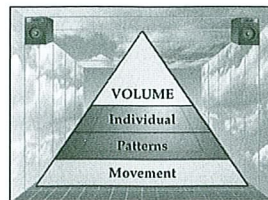
The overall amount of compression on a mix is obviously more noticeable than any individual setting. There are two ways that it can be applied. The first is based on the combined overall amount of compression added to each sound individually because some sounds may have no compression at all. The second is based on the amount of compression added to the overall mix once it has been mixed. This process, commonly done in mastering for CD pressing, only compresses the loudest sounds in the entire mix. When sounds are compressed individually during the recording and mixing of the song, all volumes could be compressed, not just the loudest ones.

Regardless of the way overall compression is applied, or calculated, certain styles of music have developed quite strong traditions as to how much they are compressed. For example, most pop music has more overall compression than most country music or punk. This can be perceived as “polish,” which some people complain is part of being over-produced. You can see the amount of overall compression on cassette deck VU meters. The meters barely move on highly compressed material.

Rhythm and blues and middle-of-the-road music are often compressed more than other styles. Acoustic music, such as bluegrass and acoustic jazz, are commonly not compressed as much. Again, these rules are made to be broken. Much of the electronic type of music (anything that uses a lot of synthesizers and drum machines) will often sound more compressed because many synthesized sounds have been compressed previous to being placed in the synth. Therefore, much of the hip hop and techno music mixes sound highly compressed.

The trick is to now pay attention to the overall amount of compression that seems to be going on in each song you hear, and develop your own values for how much compression you like.

Level 3 Dynamics: Changing Compressor/Limiter Settings (Levels and Parameters)

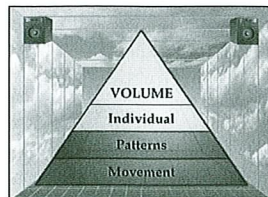


Changing the amount of compression, ratio setting, attack, or release time is rare in the midst of a mix. It is commonly done when mixing voices in a movie, video, or commercial. Narration is often compressed more than dialogue, for example. Because compression has the effect of making something sound more present, it can actually be used to create a dynamic that seems to move from more distant to more present or vice versa. One of the most dynamic effects is to change from no compression to limiting. This makes the sound seem to jump right out at you.

Normally, changes in settings are done at musical transitions in the song—such as at the beginning of a verse, chorus, bridge, or lead break—so that the change is not so abrupt or shocking. However, it just might be an interesting effect (if appropriate) to change the settings of compression while in the middle of a vocal or lead solo. When doing this, you are creating a dynamic effect so strong that it will show through the mix—therefore, it should be musically performed so that it fits the song.

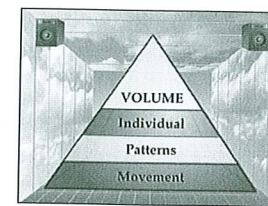
NOISE GATES

Level 1 Dynamics: Individual Noise Gate Placement and Relative Settings



The use of noise gates is primarily based on technical considerations: That is, getting rid of low volume noises and bleed from other instruments in the room. The only consideration for using a noise gate that might have developed any sort of tradition would be using a noise gate to shorten the duration of a sound by chopping off the attack or release. Otherwise, they are not used very often to shorten the duration. This is not to say that it isn't a cool effect and should not be utilized; it just isn't very common.

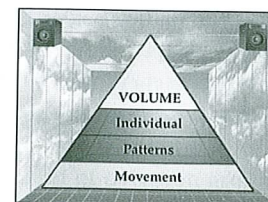
Level 2 Dynamics: Patterns of Noise Gate Placement



Extensive use of noise gates in a mix primarily results in more precise imaging between the speakers because of the way that noise gates help to isolate a sound and get rid of phase cancellation. It seems that most pop music is mixed using gates. Styles of music that are more focused on clarity, such as Steely Dan, will often use more noise gates overall.

On the other hand, some engineers prefer not to use noise gates much, especially on the drums. Using less noise gates will help make the mix sound more “live” in some engineer's eyes (or ears).

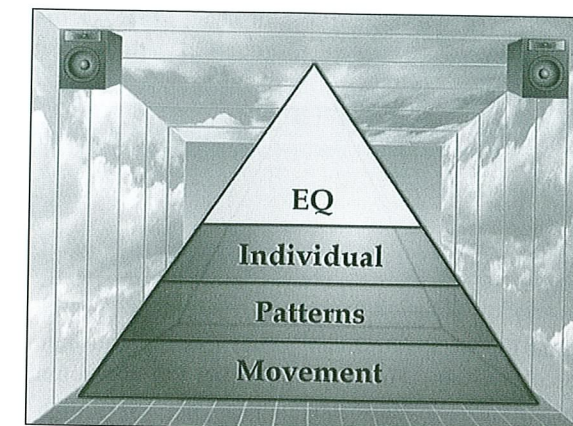
Level 3 Dynamics: Changing Noise Gate Settings (Levels and Parameters)



Settings on noise gates are rarely changed during a mix. However, to do so may give the illusion of a mix that is becoming more and more clean, with more precise imaging. You could also use noise gates to shorten the duration of a sound bit by bit, which might be totally appropriate for a song about losing weight or a shrinking reality.

SECTION B

Equalization Dynamics



If you have been doing much recording, you know that the limits of creativity are tight with EQ. There is very little room for creativity. With volume, you have more freedom. With EQ, if you can just get things to sound “right,” you are lucky (or good).

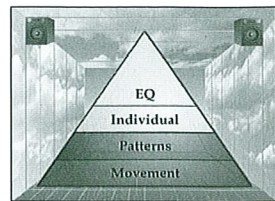
What we consider to be natural EQ for each instrument within each style of music has become entrenched in our audio consciousness. The brightness, midrange, and fullness of each instrument are now strictly defined. In fact, if we don't EQ the instruments based on these traditions, it is either considered to be wrong or exceedingly creative.

Because creativity is so limited, it is important to look closer—refine your focus, so to speak. It's like looking at the frequencies with a magnifying glass. Once you “zoom in” on the exact limitations of good and bad EQ, you can push the limits. You can be creative without going off the deep end. Often this means minuscule changes—it doesn't take much to screw up EQ. Of course, you might only be creative with EQ when it is appropriate for the style of music, the song, and if the band will let you.

As with volume, there are three levels of dynamics that can be created with equalization. First, the relative brightness, midrange, and bassiness of each instrument (relative to the rest) create small but definite differences. In fact, each instrument has developed its own traditions for what we consider to be normal EQ. If we set the EQ different from these traditions, we are creating a unique dynamic that affects the overall perception of the music or song. There is a much stronger dynamic created by the combination of all of the EQ settings together in the song. But the most powerful dynamic you can create with an equalizer is to change the EQ during the song. This tends to be even more intense than changing volume levels during a song.

EQUALIZATION DYNAMICS

Level 1 Dynamics: Individual Equalization Placement and Relative Settings



As with volume faders, there is a large and complex world of EQ relationships between instruments in the mix. There are two primary ways in which the individual EQ of a sound can create musical and emotional dynamics. First, the individual EQ of a sound can either be made to be “natural” or “interesting.” Second, the way a sound is EQ’d relative to the rest of the sounds in the mix also creates a dynamic that can be utilized for the song.

NATURAL EQ

In the beginning, the basic goal of using EQ was to make the sound natural—just like it sounded in the room where the instrument was. You can’t get any more natural than that, right? The only problem is that natural ain’t natural any more. These days natural is defined by what is currently on CDs and the radio. We have become addicted to crisper, brighter, and cleaner, as well as fatter, fuller, and bigger. Therefore, to make a sound natural can be boring and unnaturally dull by today’s standards. What we hear on the radio and on CDs these days is much brighter and crisper than the real thing. If it isn’t bright enough, it won’t be considered right.

A common mistake is to use the EQ to make a sound clearer or more separate from the other sounds in the mix, while losing track of whether the sound is still natural. This problem often happens when the engineer tries to use EQ to fix an arrangement problem when too many instruments are located in the same frequency range. For example, you might turn up the midrange to make the sound a little more present and discernible. You can now hear the details of the sound in the mix. The problem is that when you listen to the mix the next day, it sounds midrangey and honky. Therefore, whenever you EQ a sound to work well, it is always a good idea to doublecheck that the sound is still natural when in solo. You might find that you should compromise if the sound is unnatural. This will help you end up with an overall EQ that sounds natural and has some separation.

The following is a list of a few of the most common instruments and their typical EQs, to give you an idea of what we have come to expect based on the

style of music and song. Of course, these EQ settings depend entirely on the particular instrument utilized and the type of microphones used. Ideally, with the right mics, you should only have to do minimal EQ’ing, if any.

KICK

There are three general types of drum sounds that engineers seem to go for: (1) the dead thud you get with one head on the drum and some type of weight (sandbag, mic stand bottom, or brick) on top of the pillows or padding in the drum, (2) the resonant ring you get with two heads on the drum and a small hole in the front head of the drum, and (3) the dull boom you get with both heads on the drum and no hole (commonly used for rap, hip hop, or techno).

The first and second type of sounds normally have a huge amount of the muddy range taken out, as much as 10dB, in the EQ range around 300Hz. They also sometimes have a high-frequency boost of a few dB around 5000 to 6000Hz.

The third type of rap or hip hop type kick often has a bit of a boost in the muddy range around 300Hz and a boost around 40 to 100Hz for the low end. The high end, around 6000Hz, might actually be rolled off to get rid of the attack of the sound.

There are many other types of EQ for kick drums, but these are some of the most common settings.

SNARE

The snare drum is commonly only boosted in the highs around 5000 to 6000Hz. Sometimes a bit of low end is added around 60 to 100Hz to make a thin drum sound fatter. And occasionally, it is necessary to take out some of the muddiness around 300Hz. Some snare drum sounds have a midrange “flap” or edginess around 800 to 1000Hz that needs to be taken out to smooth out the sound.

HI-HAT

It is often necessary to take out just about all of the low end to get rid of the bleed from the kick drum. If you have a highpass filter, you can roll off the entire low end up to around 300 to 700Hz. It is also quite common to roll off the muddiness in the bleed from the rest of the drum kit. Occasionally, it is nice to add a bit of super high frequencies around 10,000Hz for a nice, bright sizzle up top. Also, every so often, it is necessary to take out any irritating frequencies in the midrange between 1000 to 4000Hz. However, if taken out too much, the hi-hat will sound too dull—a thin bandwidth is helpful in this situation.

BASS

On some bass guitars, it is necessary to take out some of the muddiness around 300Hz. However, if taken out too much, the bass will sound too thin and wimpy. It is also often necessary to boost the highs (much more than you would think when in solo) around 2000Hz. Occasionally, it is fun to boost the low end of the bass around 40Hz to add a solid bottom.

GUITAR

Most commonly, guitars only need to be brightened up around 3000 to 6000Hz. Occasionally, it is necessary to take out some of the muddiness around 300Hz.

VOCALS

Vocals vary tremendously depending on the sound of the person’s voice. It is quite common to not EQ vocals while recording because it can be difficult to find the exact same EQ in future vocal overdub sessions. This is fine because vocals are normally EQ’d so little anyway. Not only are we hypersensitive to midrange frequencies (where vocals hang out), but we are also extremely hypersensitive to the natural sound of vocals. We know what a voice should sound like better than any other sound in the world. Therefore, it is critical to be sparing with any vocal EQ.

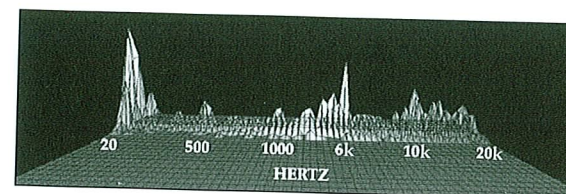
Vocals are often boosted just a couple of decibels around 5000 to 6000Hz. Occasionally, it is necessary to take out a bit of muddiness around 300Hz and a bit of irritation around 3000 or 4000Hz. The irritation sometimes comes from the harmonic structure inherent in the sound, but it can also come from a cheap or bad microphone. It is often helpful to use a highpass filter to roll off all low frequencies below 60Hz in order to get rid of any rumbling noises or bleed from any bassy instruments.

INTERESTING EQ

Certainly there are those who don’t use the traditions or history of EQ to set their EQ. Some people are very intuitive about their frequencies. I mean, how did the first engineers know how to EQ sounds? One way was to make it sound natural. But what is natural when it comes to the sound of a piece of sheet metal? What is a natural EQ for a lot of the unnatural sounds we find in synthesizers?

The EQ of a sound is sometimes based on sounding interesting rather than sounding natural. Therefore, the question becomes what makes a sound interesting?

Interesting comes in various flavors. One way is to simply not make the EQ natural. Another is to EQ it so that the maximum complexity of the sound shows through. This means to use the EQ to even out any excessive peaks in a sound. Check out this spectrum analysis of a sound.



Visual 169. Spectrum Analysis of Sound With Excessive Frequency Peaks

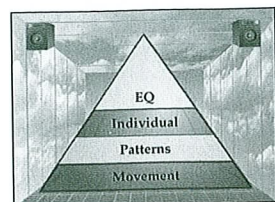
Notice the peaks around 20Hz, 6000Hz, and 10,000Hz. If you were to listen to this sound, you would primarily hear these three loudest frequencies. With EQ, you can turn down the peaks, to hear more of the entire frequency spectrum. The sound appears to be more complex, more interesting. When a sound is more complex, it sustains repeated listening better, because the closer you listen to it, the more you hear. This is a common production value for many major producers: to make a sound appear as complex as possible by getting rid of the peaks.

On the other hand, there is always the counter-culture (thank goodness). Instead of complexity, some have now reverted back to using simple sounds. For example, Phil Collins has recorded a song with an 808 snare, the tinniest and cheapest-sounding electronic snare in the world; it sounds like “doooh.” This proves that “interesting” is subjective.

But regardless of whether you EQ a sound to be interesting or natural, it is important to make sure that the EQ of the sound also works with the other sounds in the mix. As previously described, the sound should have appropriate highs, midranges, and lows relative to all of the other sounds. As with “balancing volume relationships,” it is commonly most desirable to have the EQ of all of the instruments as even as possible, so that they blend well. However, it is often desirable for certain instruments in a mix to be unusually bright, dark, or midrangey. In fact, sounds can be made to sound more similar to each other or more dissimilar. A lead instrument might be made more cutting and abrasive so as to really grab attention. An instrument might be given extra bass to make the song more danceable or just to excite the listener.

The particular EQ of a sound and its relationship to the rest of the sounds in the mix creates another musical and emotional dynamic for the engineer to wield in his or her quest for the perfect mix—even though perfection has no limits.

Level 2 Dynamics: Patterns of Equalization Placement

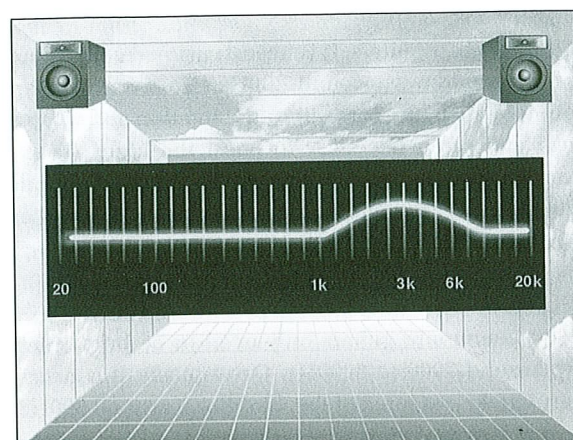


The combination of all EQ settings together in the song creates a much stronger dynamic in a mix than any single individual EQ setting. In fact, the overall EQ is one of the most important dynamics because it is critical for a mix to sound correct for all the styles of music that we know so well. When anyone listens to a mix, the first thing they hear is the overall EQ.

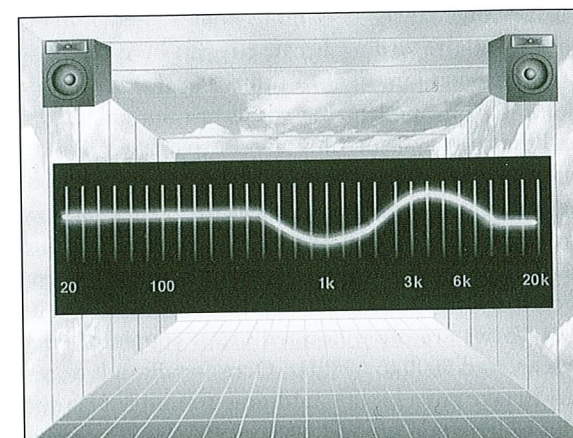
The engineer EQs each instrument so that the overall EQ of the song will sound like a particular type of music usually sounds. For example, country has an overall natural EQ. Heavy metal has more of a boost in the cutting midrange frequencies. Rap and hip hop have the low end boost.

The type of song also can determine the general EQ of the mix. For example, you just might make the overall EQ a bit more edgy and cutting for a song about chainsaw murders, whereas a song about sweet and sensitive love might have an overall EQ that is very pleasing and conducive to mush.

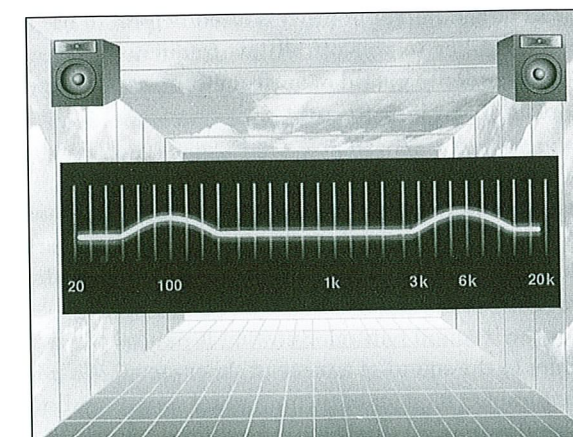
Aside from the style of music and the song, often certain engineers have their own style that they prefer. These engineers tend to create mixes with overall EQs they happen to be partial to. Here are some typical—in fact, stereotypical—overall EQs for different styles of music. These EQ curves are sometimes very specific for certain styles of music.



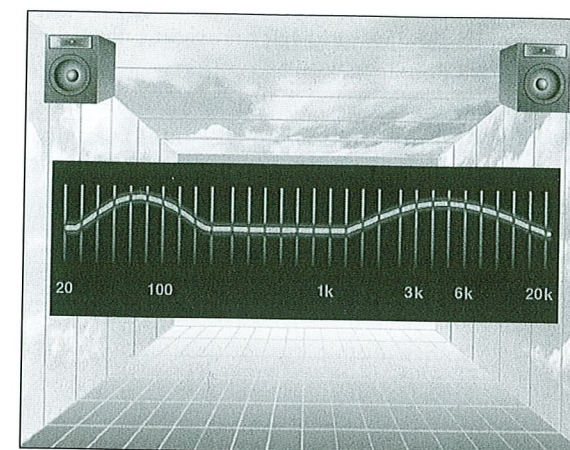
Visual 170. General Overall EQ for Heavy Metal



Visual 171. General Overall EQ for Jazz

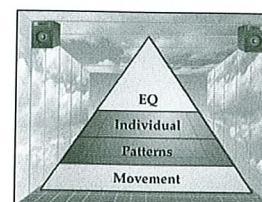


Visual 172. General Overall EQ for Country



Visual 173. General Overall EQ for Rap and Hip Hop

Level 3 Dynamics: Changing Equalization



Because we are so limited as to how creative we can be with EQ, making EQ changes in a sound while it is playing creates an extremely noticeable dynamic. If not appropriate for the song, this could be quite distracting. If appropriate, it could be quite effective.

Making an EQ change at a break in the song is the most natural way to create a dynamic. Jethro Tull did it in the song "Aqualung" when the voice changes to a telephone EQ. Pink Floyd also did it in the album *Wish You Were Here* when the acoustic guitar sounds like it is in a little box.

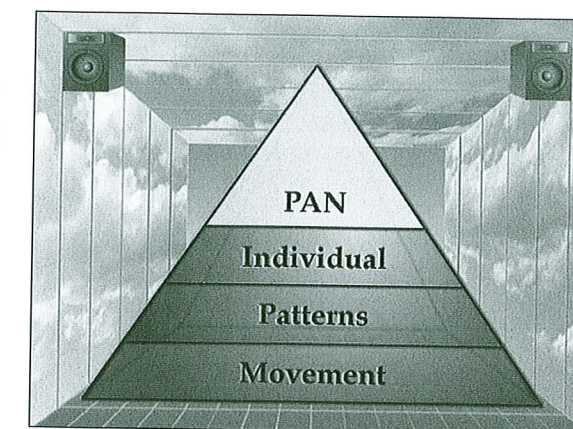
If you change EQ at the beginning or end of a section in a song, it is not nearly as noticeable as when you make a change in the middle of a part. Probably the most bizarre effect is to actually sweep the frequency knob of an EQ in the middle of an important part, such as a lead solo. Doing this totally takes the focus away from the music itself; however, if done in a way that works with the music and song, it can be extremely cool.

Currently, it is considered very unusual to actually change EQ settings during a mix. However, it just might be the next creative frontier, especially for those mixing hip hop and similar styles of music.

The musical and emotional dynamics that can be created with EQ—EQ placement, overall EQ, and changing EQ—all depend on the style of music, the song and all of its details, and the people involved.

SECTION C

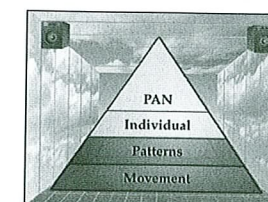
Panning Dynamics



As with volume and equalization, there are three levels of dynamics that can be created with the placement of panpots on a mixer. First, a sound will be perceived differently depending on where it is placed in the mix, left to right. For some instruments, the traditions for the specific placement of left to right have become very strictly enforced. Panning is also based on the relationship of a particular instrument to the panning of the rest of the instruments in the mix. But when you create patterns of panning, you establish a much more powerful musical and emotional dynamic. For example, a lopsided mix left to right will come across quite differently than a mix that is balanced from left to right. Finally, when you move a panpot during a song, you are creating a dynamic almost as strong as an earthquake. Now let's explore the three levels of dynamics.

PANNING DYNAMICS

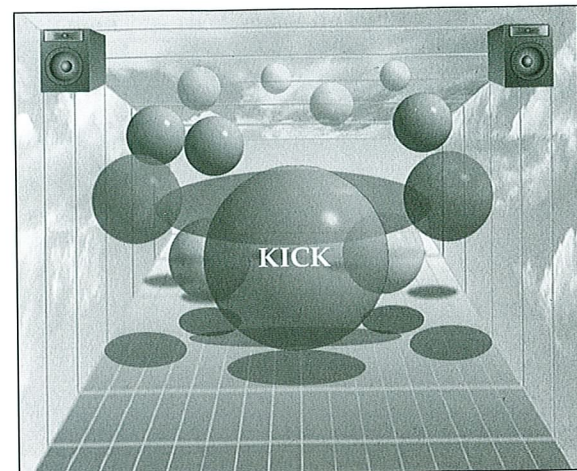
Level 1 Dynamics: Individual Panning Placement and Relative Settings



If you follow the traditions, you create a dynamic that is transparent and lets the music show through more. Whereas, if you don't follow tradition, you are then considered to be "creative." Unusual panning can actually create tension; this can be cool if appropriate. Let's go through typical panning placement for some well-known instruments and sounds.

KICK DRUM

It is rare that the kick drum is ever placed anywhere except in the middle, exactly between the speakers.



Visual 174. Kick Drum Panned to Center

It isn't necessarily wrong to place it somewhere else, but it has become commonly accepted there. It is interesting to speculate why the kick has been relegated to the center. First, the kick often takes up a large amount of space in the world of imaging. There is simply more room in the middle. Also, the kick drum has so much energy it commands our attention. We are often compelled to turn and face the music, especially loud and powerful sounds. Therefore, if you are facing the kick in the middle, your peripheral vision (or hearing) can see the other sounds better. If you were facing a kick on one side, then you would be off balance.

Aside from the imaging, there is another reason, based on physical reality, for the kick to be placed center: When a sound is in the middle, you have two speakers carrying the sound instead of one. The speakers don't have to work as hard, especially with big sounds like kick drums and bass guitars. Therefore, technically it sounds better when in the middle. Also, the kick drum is normally in the center of most drum kits.

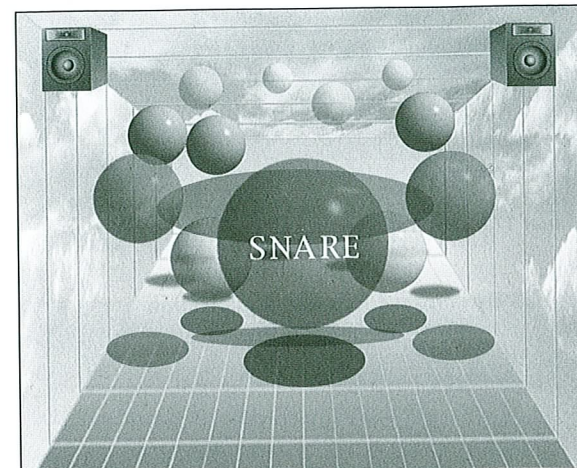
Regardless of the reasons for placing the kick drum in the center, it has become a pretty strict tradition. If you place it anywhere else, watch out... you could be admonished for being too creative.

Two kick drums, or a double kick, presents an interesting dilemma when it comes to panning. The main deciding factor depends on how often the second kick drum is played. Some people will pan them slightly left and right, others will place the main kick in the center and only pan the second kick slightly. To pan the two kick drums completely left and right is highly unusual, or creative, but has been done. I've

even panned the two kicks left and right only at the moment of a double kick roll.

SNARE DRUM

The snare drum is also most commonly placed in the middle.

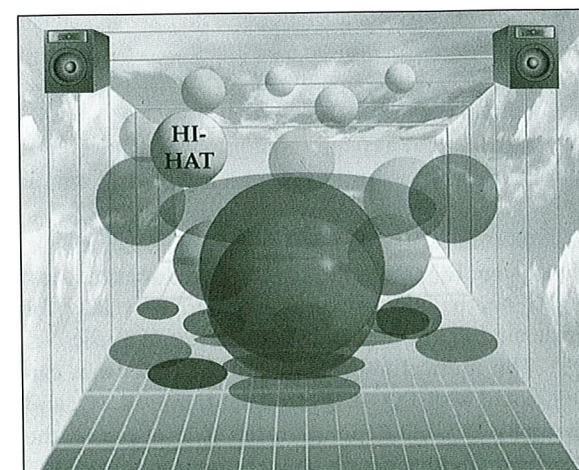


Visual 175. Snare Drum Panned to Center

Although some engineers do place it a bit off to the side—especially in jazz—because the snare drum is off to one side in a real drum set. If the snare drum sound is huge (bigger sound and/or more reverb), it is more commonly placed in the center. This is probably because it is taking up so much more space (similar to the kick drum). It is interesting that the snare has come to be so commonly placed in the center when it is actually so far to one side on most drum sets.

HI-HAT

The hi-hat is often placed about halfway between one side and the middle (we'll discuss which side later).

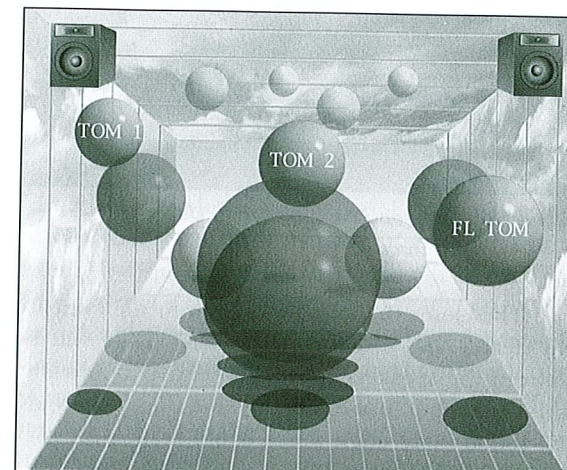


Visual 176. Hi-Hat Panned Halfway Between Left Side and Middle (see color Visual 176C)

This is also interesting because the hi-hat is normally as far left on a real drum kit as any sound. However, often when the mix is busier, the hi-hat is panned all the way to one side. This is also the case when the mix being created is meant to be "spatial." Meanwhile, in house music and hip hop, not only can the hi-hat be panned anywhere, it is commonly moved during the mix and is sometimes panned far left with a delay panned to the far right.

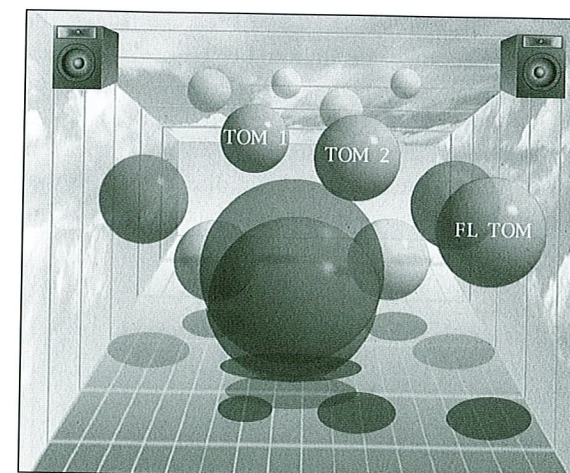
TOM TOMS

In order to provide maximum fun, tom toms are commonly spread completely left to right or right to left.



Visual 177. Toms Panned Completely Left to Right (see color Visual 177C)

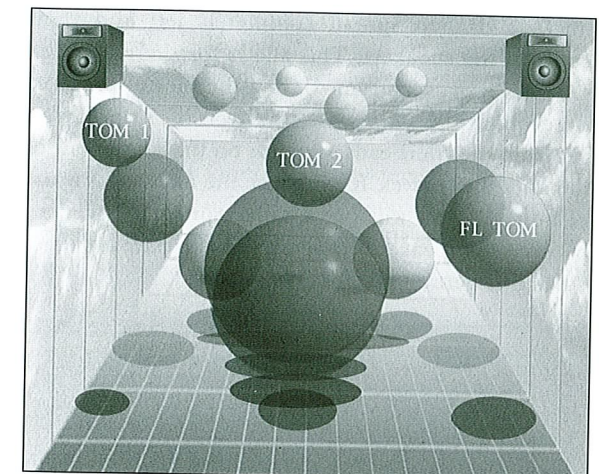
However, for natural panning, the toms are sometimes placed between the speakers exactly as they are on the actual drum set.



Visual 178. Toms Panned Same As on Drum Kit (see color Visual 178C)

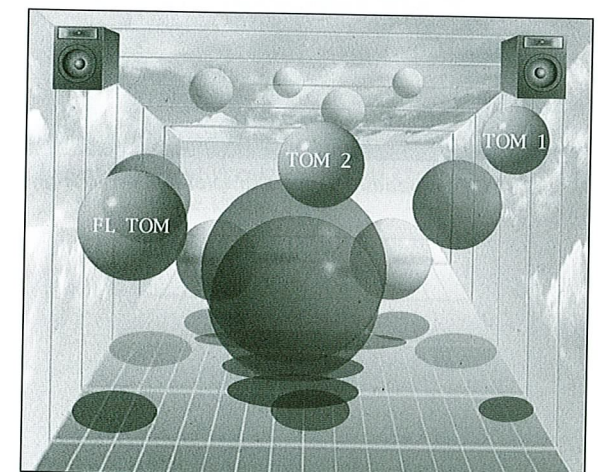
A floor tom is normally placed on the far side. However, occasionally the floor tom will be placed in the center for the same reason we normally put a kick drum and a bass guitar in the middle—because it is so powerful, commands so much attention, and will sound better when both speakers are carrying the sound.

The discussion of tom placement brings up an interesting question: Should the toms be panned from left to right, as if from the drummer's perspective...



Visual 179. Toms Panned Left to Right

... or from right to left, as if from the audience's perspective?



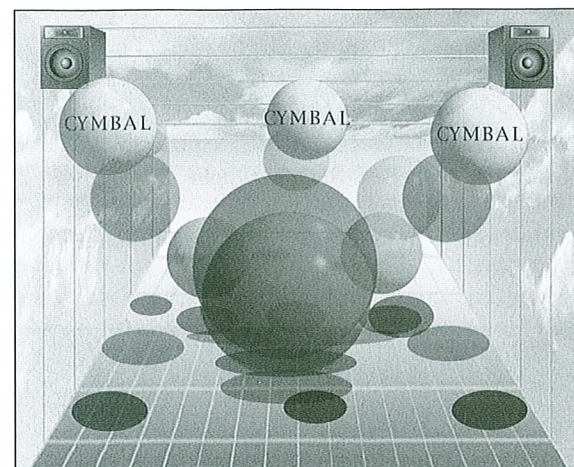
Visual 180. Toms Panned Right to Left (see color Visual 180C)

Those who do live sound wouldn't be caught dead with the toms panned left to right because they always see it this way in a live show, but it seems that just as many engineers pan from left to right (just like we read). If the band is being recorded live, or if the band is being recorded as if they were live, then the

toms should probably be panned right to left, from the audience's perspective, because there is an audience. Even though it really doesn't matter which way you pan the drums in a mix, most people seem to have very strong feelings about the matter, so it's good to be aware of the preferences of the people you are working with. Besides, it would be boring if all toms were panned the same way.

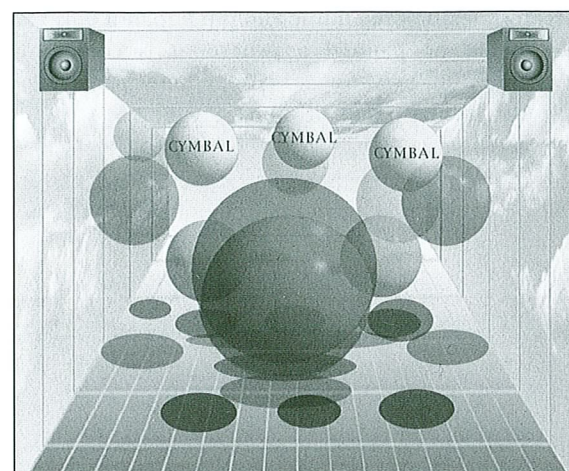
OVERHEADS

Overheads are normally recorded in stereo on two tracks and then spread completely left and right between the speakers. This allows for the maximum separation between cymbals and the widest spread of stereo imaging. Of course, the type of imaging you get from the overheads depends on the placement of the mics themselves. If you place the mics as far apart as possible, you will get a wider spread of cymbals between the speakers; however, you also have a greater chance of getting phase cancellation.



Visual 181. Overheads Panned Completely Left to Right

If you place the mics next to each other in the middle using the "X" technique, there is less spread between the speakers; however, the imaging is often a little clearer because there is no phase cancellation.

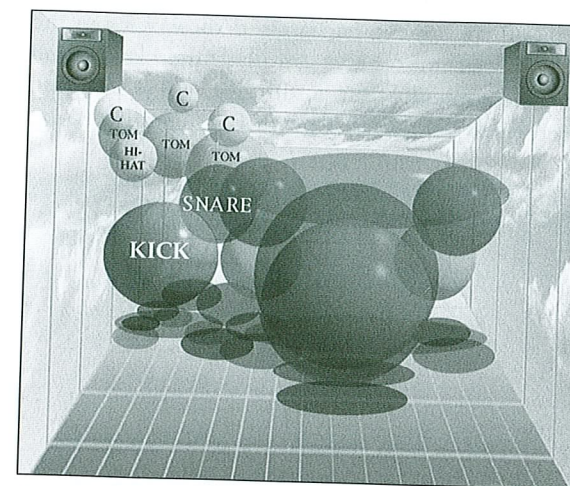


Visual 182. Overhead Panning When Using "X" Technique

The closer the mics are placed to the cymbals, the clearer and more up front the image will be between the speakers (put a mic closer to anything and it will sound more present), but the cymbals will also sound more edgy, which could be fine for rock 'n' roll.

DRUMS AS A WHOLE

It is interesting to note the way that drums have been panned throughout the history of recording. The Beatles placed the vocals in one speaker and the rest of the band in another. Though this was, in reality, a mistake. They meant for the two tracks to be mixed down to mono when the record was made, but the mastering engineer decided to be creative. Many jazz groups have placed the entire drum set in one speaker. The obvious advantage of doing this is that it leaves a huge amount of space between the speakers for the rest of the band. The big disadvantage is that the separation between individual pieces of the drum set becomes obscured.

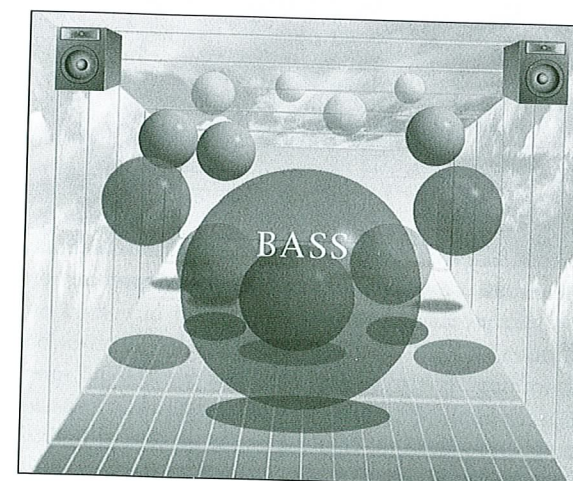


Visual 183. Mix With Drums Panned to One Side (see color Visual 183C)

NOTE: In order to obtain the most natural panning of a drum set, try this: Pan the overhead mics on the drum kit completely left and right, listen to where each drum seems to be between the speakers in the stereo overhead mix, then pan the mic of each individual drum exactly where you hear it. This will give you the clearest imaging you can obtain because the image of the instrument in the overhead mix is in the exact same place as the image in its own mic. If they are not panned the same, then you are actually spreading the sound in stereo between the speakers—making the image less precise.

BASS GUITAR

Bass guitar is most commonly placed in the middle because it is so large and commands so much attention, like the kick drum.



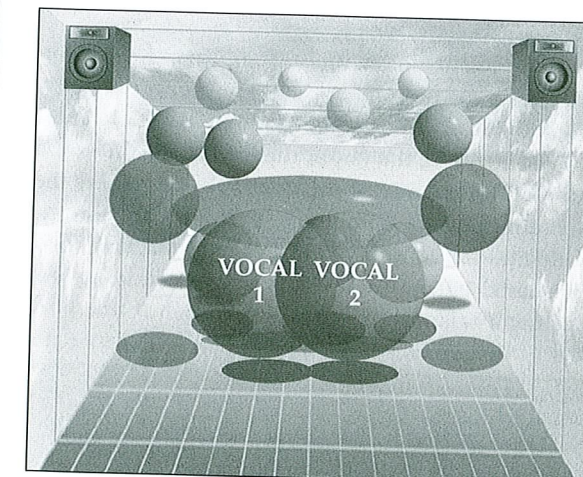
Visual 184. Mix With Bass Guitar Panned to Center

Jazz and similar types of music often place the bass off to one side. Aside from the style of music dictating the panning, a bass is normally only panned off to one side if the part being played is a lead part. When this is the case, the bass is often a much brighter and cutting type of sound. When the bass sound is thinner, there tends to be more room for the bass to be placed off to one side.

LEAD VOCALS

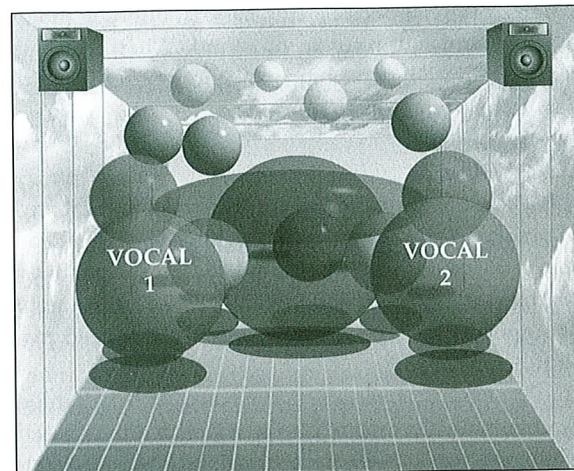
It is almost against the law to place a lead vocal anywhere except smack dab in the middle. Pan a lead vocal to one side and go to jail. By most standards, you are simply being too creative. However, it might be appropriate if the song is about unbalanced psychotic behavior.

If a vocal is recorded in stereo with two mics, doubletracked, or made into stereo with a time-based effect, the two sounds are normally spread evenly left to right. Sometimes they are placed at 11:00 and 1:00.



Visual 185. Lead Vocals Panned at 11:00 and 1:00 (see color Visual 185C)

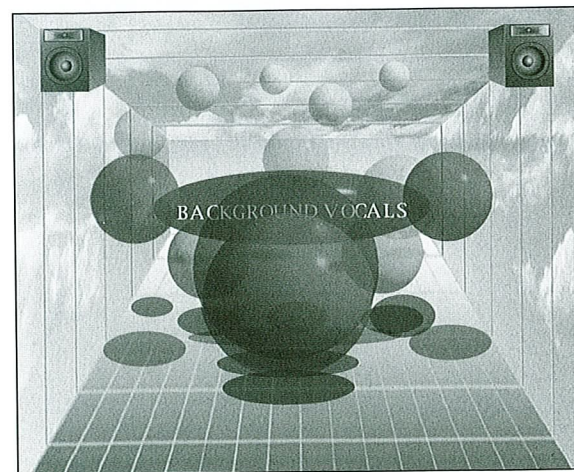
Sometimes they are placed at 10:00 and 2:00. But occasionally, they are placed completely left and right.



Visual 186. Vocals Panned Completely Left and Right

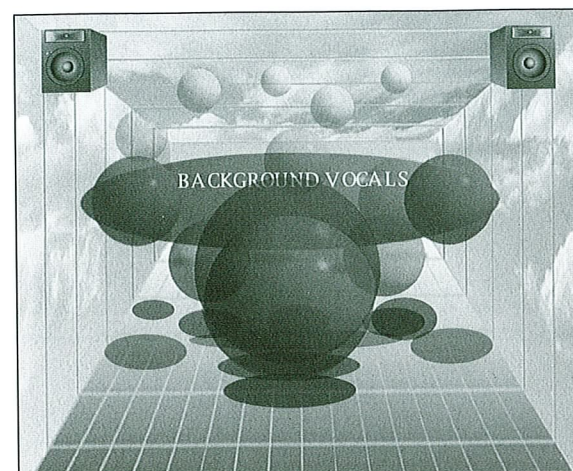
BACKGROUND VOCALS

The panning of background vocals often depends on the vocal arrangement. When there is only one background vocal, it can't be panned in the center because it gets in the way of the lead vocal. You could put it off to one side or the other, but this makes the mix unbalanced. Commonly, a single harmony is made into stereo with two mics, doubletracking, or a time-based effect. Then it can be panned in stereo, creating a balanced mix from left to right.



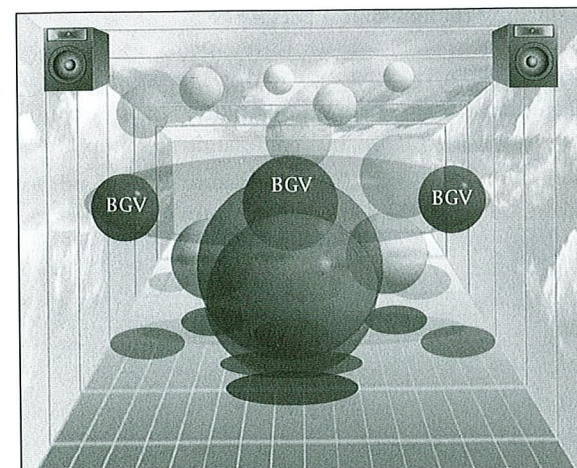
Visual 187. 1 Stereo Background Vocal Panned From 11:00 to 1:00 With Fattening

If there are two background vocals singing the same part in unison and you place the background vocals completely left and right, they will pull together, creating a line of vocals.



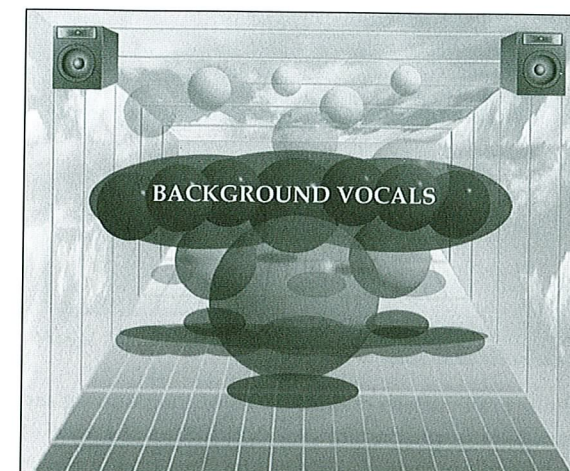
Visual 188. 2 Background Vocals "Pulling Together"

If the background vocals consist of different harmony parts, they won't pull together as much. The more different the sound of the voices that are doing the harmonies, the less they will blend together, the more they will stay separate. If the same person does all of the parts, they will blend more.



Visual 189. 3 Background Vocals Panned Separately (see color Visual 189C)

Background vocals are commonly recorded in stereo, doubletracked, or made into stereo with a time-based effect and then spread left to right. As you can see, there is a wide range of possibilities.



Visual 190. 7 Background Vocals Panned to 7 Different Places Combined With Variety of Fattening (see color Visual 190C)

The style of music can also make a difference in panning. For example, in country music, many engineers will only pan the background vocals from 11:00 to 1:00 or from 10:00 to 2:00, in order to give the impression of a tight-knit harmony group.

PIANO

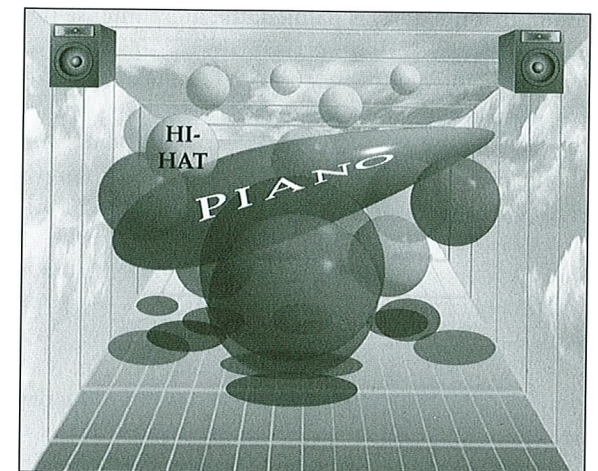
A solo piano is almost always panned completely left and right in stereo. The bass strings are panned to the left and the high strings are panned to the right, because this is the way a keyboard is laid out. It is funny that this is probably the strictest rule of all when it comes to panning. You better shoot the piano player before you pan the high end to the left. You might think this is odd because when standing in front of a piano, the high strings are on the left. Even in a live show with a stereo PA, the piano is still panned with the lows on the left.

When in a mix, a piano is still commonly panned in complete stereo, just because it sounds so nice that way. That is, if there is room in the mix. A stereo sound takes up a lot more space in the mix; however in certain styles of music, such as country, even in a busy mix, the piano is still commonly panned completely left to right. Sometimes it is pulled in a little bit or panned more to one side to leave room for other sounds. In some busy songs, the piano is panned in one spot to leave room for the rest of the mix.

The panning also depends on the type of musical part being played. If the part is full of rich sus-

taining chords, it will tend to be panned in full stereo. On the other hand, if it is very staccato and rhythmical with many single notes, it might be panned in one single spot.

One argument for panning the drums from the drummer's perspective is that if you were to place the hi-hat on the right, it would be hidden by the high end of the piano. There is less masking from the high end of the piano when the hi-hat is placed on the left.



Visual 191. Panning With High End of Piano on Right and Hi-Hat on Left (see color Visual 191C)

NOTE: If you don't have enough tracks to record the piano in stereo, you could actually pan the piano from left to right when the pianist plays from low to high notes; this is a great way to cheat with a lead break. When they go up the keyboard, pan to the right; when they play lower notes, pan to the left. Cheap stereo, but it works.

GUITARS

Panning guitars is based on concerns similar to those for piano and keyboards. Often the guitar is placed in a particular place based on the placement of everything else: crowd control. If you want the guitar to be more interesting or present, you might try fattening to spread it in stereo.

HORNS/STRINGS

It is interesting that horns and strings are almost always spread in stereo completely left and right across the stereo field. The horns or strings can be recorded with more than one mic, played twice, or a time-based effect can be used to make the instruments stereo. The horns or strings might not be spread completely in stereo (partial stereo or mono) if there isn't enough room in the mix.

EFFECTS

Effects like delay, flange, chorus, phase, harmonizer, and reverb can be panned separately from the instrument sound they came from.

Delay

When the delay time is greater than around 30ms, it is perceived as a separate sound. This separate "sphere" is often placed wherever there is room for it (crowd control). The further from the original dry sound that the delay is panned, the more intense the dynamic created. However, it is easy for this effect to overwhelm the song. Sometimes it is quite effective to pan the delay right on top of the original dry signal.

When the delay time is less than 30ms, the sound is stretched between the speakers. As previously covered, this effect is called fattening. The primary consideration for fattening is the duration of the dry sound. Fattening is rarely used on staccato sounds. They just seem to take up too much room for something so quick. If you were to use fattening on a sound with a short duration, you might not pan it so wide—maybe only 11:00-1:00 (or just around the dry sound itself if it is panned off to one side).

On the other hand, sounds that are longer in duration (legato) are often panned completely left and right in stereo with fattening.

Once the drums and bass are mixed, you should calculate which instruments will be spread in stereo with fattening and which ones will be in one spot. This calculation is based on the style of music, the number of instruments/sounds in the mix, and whether each sound is staccato or legato. Once the entire mix is up, you can always change your mind and either add or delete fattening.

Flanging, Chorus, Phasing

Because these effects are based on a short delay time, like fattening, they are panned based on the same criteria. The only difference is that these effects are much more noticeable; therefore, they might not be panned quite as wide as fattening.

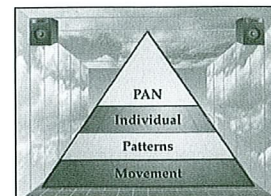
Reverb

Reverb is most commonly placed in stereo, completely left and right. This is to simulate the natural sound of reverb in a room: It comes from everywhere around you, as if you are trying to simulate a live situation. This is especially common when putting reverb on drums.

Of course, you can place reverb anywhere you want. For example, you could put a guitar in the left speaker and place the reverb in the right speaker. It is also quite effective to place the reverb right on top

of the dry sound. For example, place a keyboard on the right and put the reverb in the right speaker also. This can be very interesting especially when using short reverb sounds or gated reverb. Any placement of individual instruments other than the above norms might be considered creative or unusual, depending on your perspective.

Level 2 Dynamics: Patterns of Panning Placement



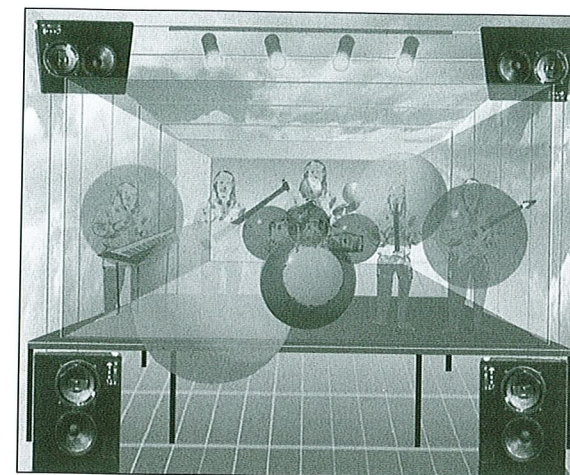
The overall pattern created by all of the panning settings together is even more important to the style of mix than any individual panning. The type of music tends to make the biggest difference as to the overall panning in the mix. And again, certain styles of music have developed more strict traditions than others. Also, the details of the song, especially the density of the arrangement, can affect the overall placement left to right. Often the more instruments in a mix, the wider the overall panning.

There are a few different ways to look at the types of patterns that can be created. We can base this overall panning on natural panning, balanced vs. lopsided panning, or crowd control.

NOTE: Before stereo became popular, mixes had to be created so all the sounds could be heard with no panning at all. This is good to keep in mind. In fact, you should always doublecheck your mix in mono to make sure that is OK in the first place, before using panning to create clarity. After all, listeners are often not seated in the correct position between the speakers to hear true stereo.

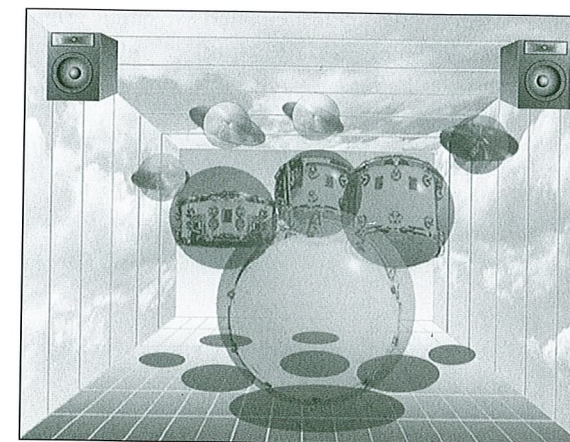
NATURAL PANNING

If we think of the space between the speakers as a pallet on which to place sound colors, we can place sounds left to right, filling in the space in any way we want that seems to work. There is an infinite number of different structures of mixes that can be created with simple panning. However, sometimes panning is done so that it corresponds to the placement of the band, as if onstage, or the way they are set up in the studio.



Visual 192. Panning as If Onstage (see color Visual 192C)

Sometimes the drums might be panned exactly the way the drum set is physically set up.



Visual 193. Natural Panning of Drum Kit (see color Visual 193C)

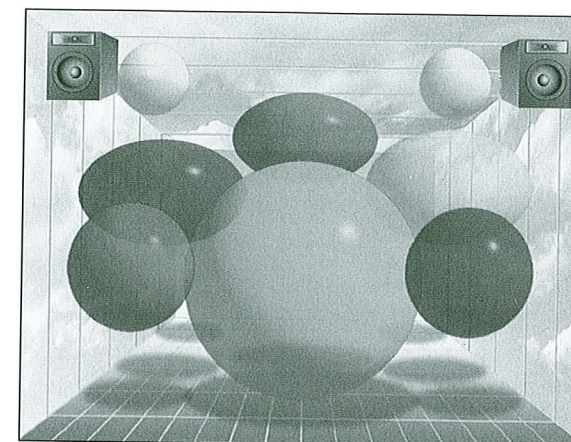
Again, it is often the style of music that determines if panning is to be natural. For example, you can practically do whatever you want in hip hop or techno; whereas in big band music, it is very important to pan everything in the same way that the band sets up onstage. Acoustic jazz is also sometimes panned just the way the band sets up live.

An engineer will sometimes place the musicians in the studio as if they were live onstage, just so they feel comfortable. For example, a folk group or chamber orchestra is commonly set up in a semi-circle out in the studio, then panned exactly the same way in the mix. Technically, the imaging will be better; there is less chance of phase cancellation and the relationships between the instruments are kept in their natural state. This helps to create the illusion that you are there with the band.

In classical music, it is an extremely strict rule that the panning is done exactly the way the orchestra sets up. In fact, there are very particular rules when it comes to setting up an orchestra onstage, so everyone can hear the rest of the orchestra correctly.

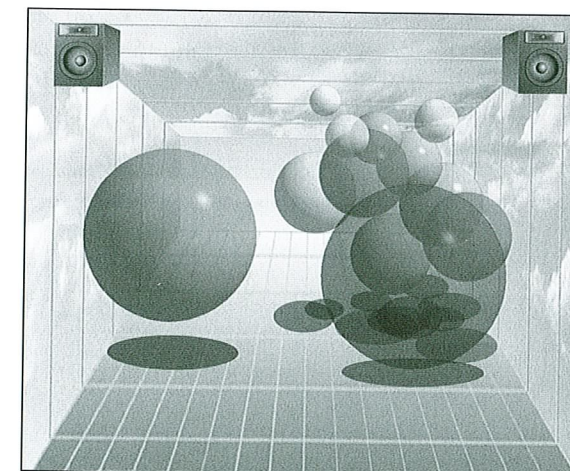
BALANCED VS. LOPSIDED PANNING

Probably one of the strongest dynamics that can be created with patterns of panning is the difference between a balanced (symmetrical) mix . . .



Visual 194. Balanced (Symmetrical) Mix (see color Visual 44C)

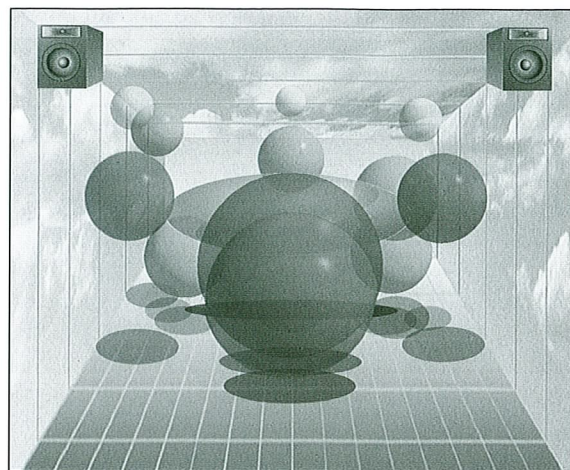
. . . and a lopsided (asymmetrical) mix.



Visual 195. Lopsided (Asymmetrical) Mix (see color Visual 45C)

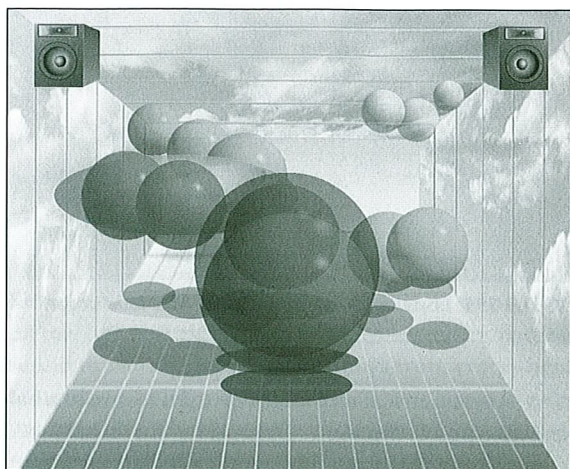
A symmetrical mix might be used to create a balanced type of dynamic appropriate for a balanced type of song, such as a love song, a ballad, or a song about a balanced ecology of mind. Whereas an asymmetrical mix might be used to create a bit of tension appropriate for an unbalanced type of song, such as a song about psychotic, unbalanced behavior.

A mix is often made to be balanced or lopsided at each frequency range. For example, if you are creating a symmetrical mix, you might put a hi-hat on the left and place a shaker or acoustic guitar on the other side to balance the high-frequency range. In the midrange, you might put a guitar on the left to balance a midrange keyboard on the right. In the bass range, the kick and bass would be placed in the center.



Visual 196. Mix Balanced at Each Frequency Range (see color Visual 196C)

On the other hand, if you're creating a lopsided mix, you might put all of the high-frequency sounds on one side and put the midrange instruments on the other side. Then for a bizarre effect, put the bass guitar on one side and the kick drum on the other side. Because this type of mix is out of the ordinary, it creates a component of tension.



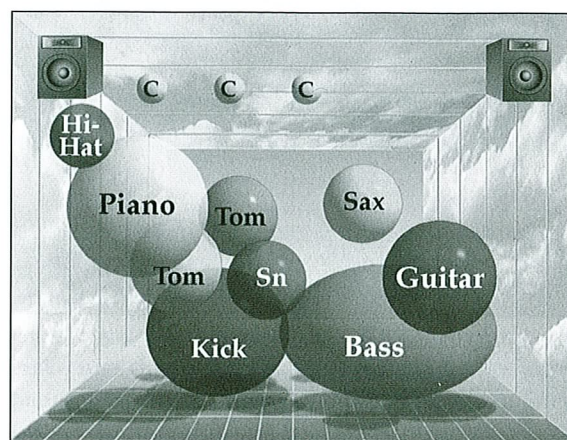
Visual 197. Unbalanced Mix at Each Frequency Range (see color Visual 197C)

As you can see, the possibilities are endless, depending on the song and what you want to do. Creating balanced versus lopsided mixes can be an especially effective dynamic when it is appropriate.

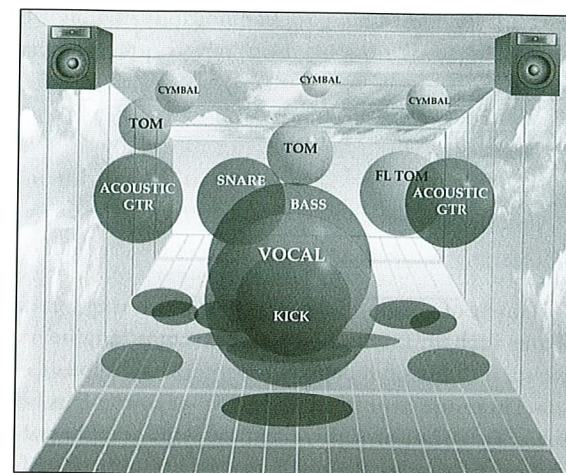
CROWD CONTROL

Natural panning can be . . . natural, but these days it is actually much more acceptable to not pan instruments as they are on stage. This pallet between the speakers is a different medium than that of a live show. Why not utilize it to its fullest? Most people pan things to wherever they sound the best, coolest, or most interesting, instead of basing their placement on where the band members happen to stand on a stage. Therefore, if we think of the space between the speakers as a pallet, then the panning can be based on crowd control. How close are the members of the crowd to each other? Are they far apart, just touching, overlapping, or right on top of each other?

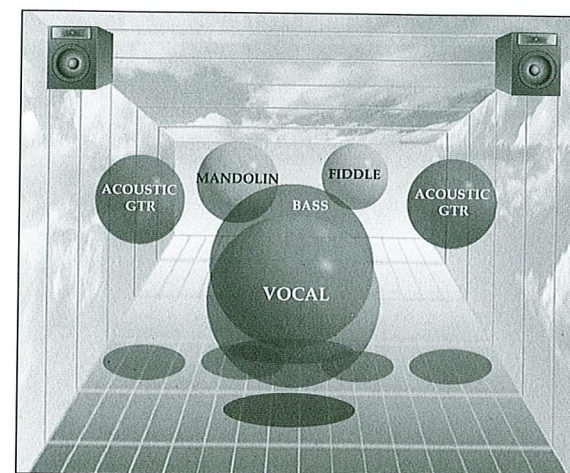
You might want some sounds to be panned as far from each other as possible, in order to create clarity, so they don't touch each other. Such a dynamic might be appropriate for certain types of music, like acoustic jazz, folk music, or bluegrass.



Visual 198. Clarity Style of Mix: Acoustic Jazz (see color Visual 198C)

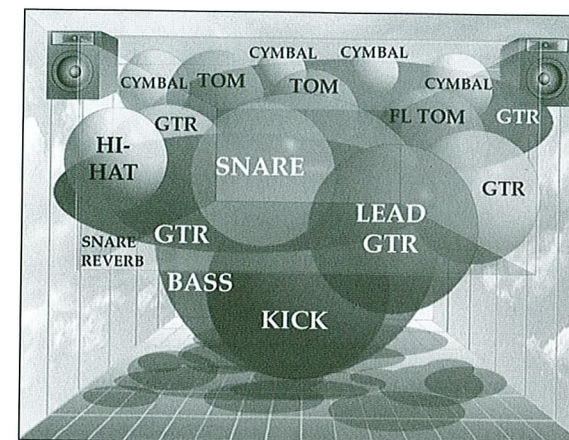


Visual 199. Clarity Style of Mix: Folk Music (see color Visual 199C)

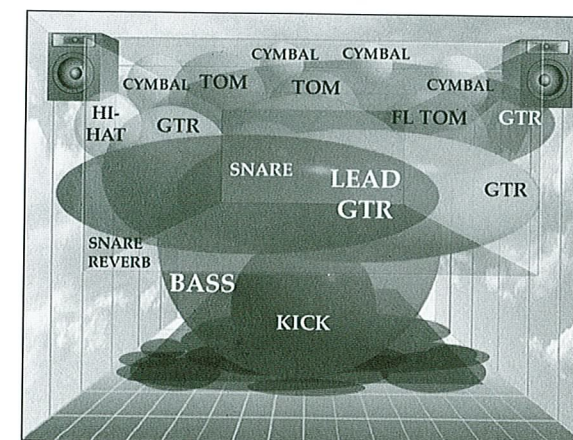


Visual 200. Clarity Style of Mix: Bluegrass (see color Visual 200C)

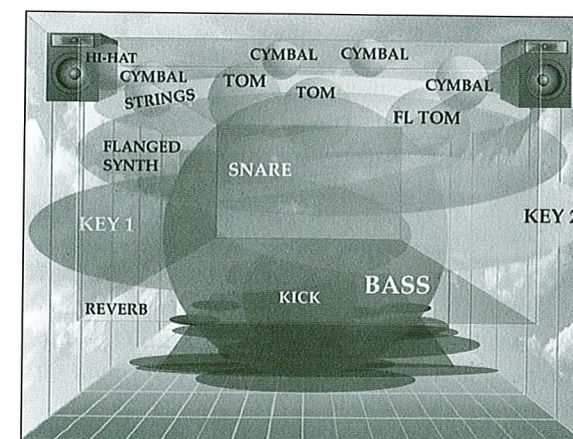
On the other hand, sounds may be panned to overlap in order to create a wall of sound, making the mix seem more cohesive. This is commonly done in heavy metal, alternative rock, and new age music.



Visual 201. Wall of Sound Style of Mix: Heavy Metal (see color Visual 167C)

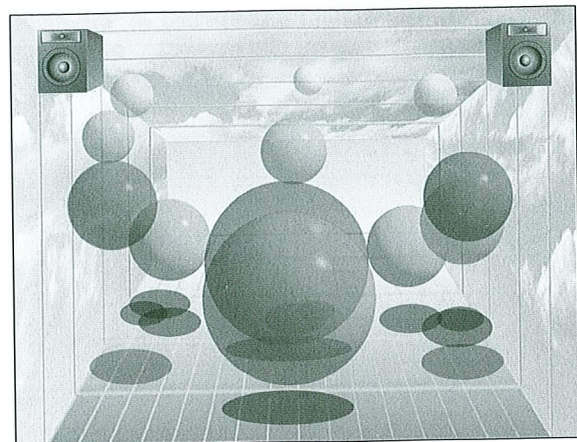


Visual 202. Wall of Sound Style of Mix: Alternative Rock (see color Visual 168C)



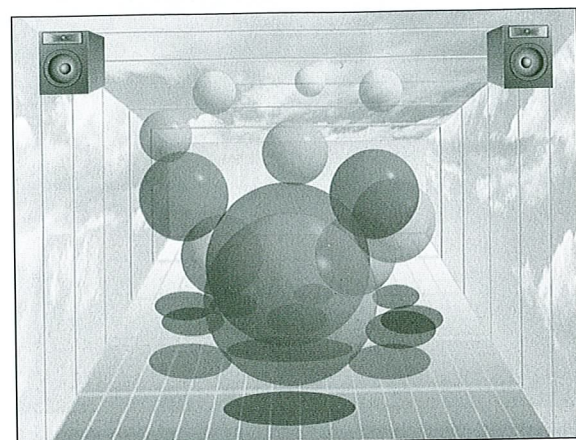
Visual 203. Wall of Sound Style of Mix: New Age (see color Visual 203C)

Besides the way that sounds overlap or not, there is also the difference between panning an entire mix as wide as possible between the speakers . . .



Visual 204. Mix With Extremely Wide Panning Overall
(see color Visual 204C)

. . . versus not so wide.

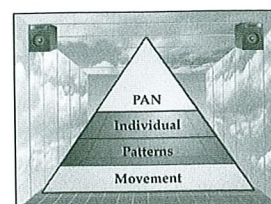


Visual 205. Mix With Panning Not So Wide Overall (see color Visual 205C)

The advantage of panning things as wide as possible is that it provides more space between the sounds, thus creating more clarity. The disadvantage is that it can make the band sound less cohesive. By making the spread narrower, the band and all of its parts sound more like they are playing together. It all depends on the density of the mix and the style of music.

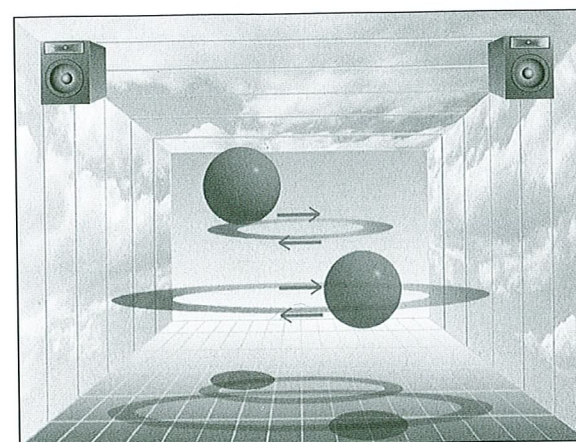
With 3D sound processors and surround sound, you actually have more space to work with. Therefore, the possibilities for panning and placement are expanded tremendously.

Level 3 Dynamics: Changing Panning



Movement of a sound from left to right during a mix creates such an intense dynamic that most engineers save such dramatic creativity for special occasions.

There are a number of ways that sound can be moved from left to right, creating innumerable patterns of movement. First, you can pan a sound in different distances. Possibilities range from short, minuscule moves to wide, sweeping moves that span the entire distance from speaker to speaker.



Visual 206. Wide vs. Narrow Sweeping Panning

But you can also pan sounds at different speeds, ranging from pans that move slowly to pans that zoom back and forth between the speakers. You might cause some serious goosebumps by making the speed, or rate, of the pan equal to, a fraction of, or a multiple of the tempo in the song. And aren't goosebumps the goal most of the time?

Changing panning is so intense that it will usually pull attention away from the song itself. However, if the panning is done skillfully, it contributes to the music as if the panpot is an instrument itself. Obviously, when it is appropriate for the song, this can be a great effect. Hendrix did it a lot, especially in the song "Crosstown Traffic." Led Zeppelin went bananas in "Whole Lotta Love." Extensive movement of panpots has become quite common in hip hop and techno.

One of the most intense, fun, or chaotic things you can do is move the panning of multiple instruments in various ways all at once. Such a strong

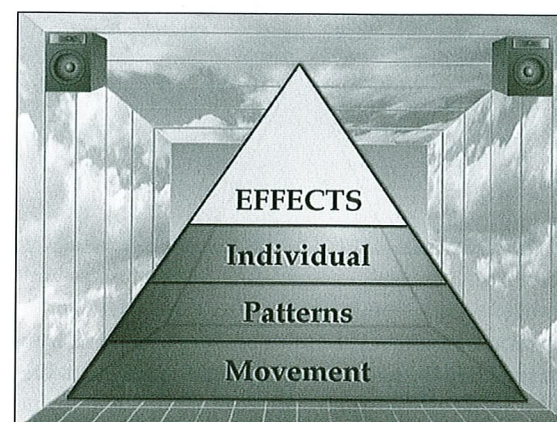
dynamic is normally reserved for songs where it might be appropriate and when the band will let you.

As you can see, you can create a plethora of emotions by how you set or move panpots in a mix. If you set them based on tradition, the dynamic is often unnoticeable. However, if you set them different from the norm, you create a stronger dynamic. If you set all the panpots to create patterns, you are really wielding some power.

A balanced mix will probably fit in and not be noticed. But if you make a lopsided mix, it will more than likely stick out, almost as if it is another musical part in the song. Finally, if you move the panpots during the mix, you aren't fooling around. Go for it, if appropriate.

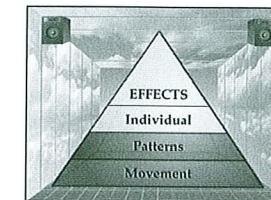
SECTION D

Time-Based Effects Dynamics

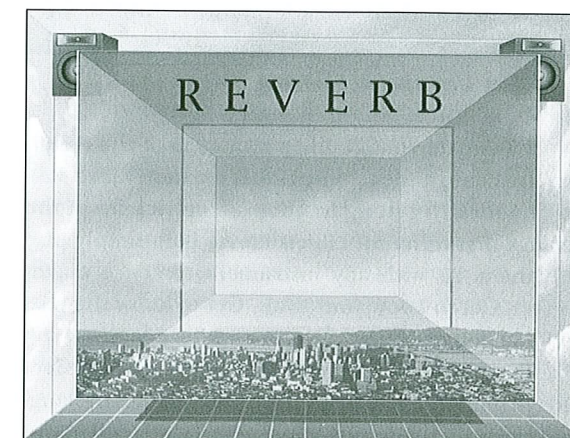


There is an incredibly wide range of effects, and the dynamics that they create range from subtle to shocking, mesmerizing, and world changing. Furthermore, when we use multiple effects together to create a pattern, we can elicit a conglomeration of feelings and emotions that can be overwhelming or just good, clean fun. But changing the levels of effects, which can include changing the parameters of effects, during the song opens up entirely new avenues of creative expression. I'll now go into more detail on each of the three levels of dynamics that can be created with effects.

Level 1 Dynamics: Individual Effects Placement and Relative Settings

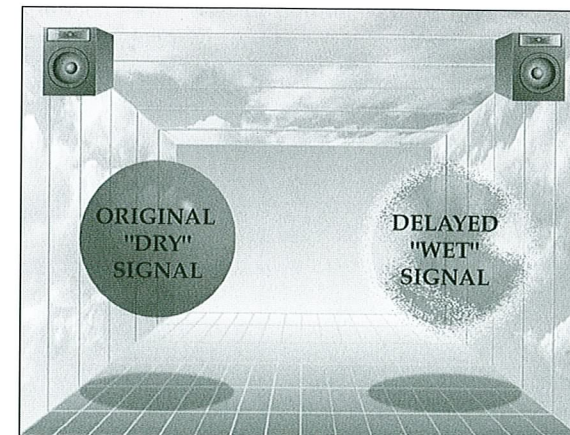


Each and every effect in the studio has its own world of emotional dynamics associated with it. For example, reverb creates a more spacious (pick your own adjective) feeling:



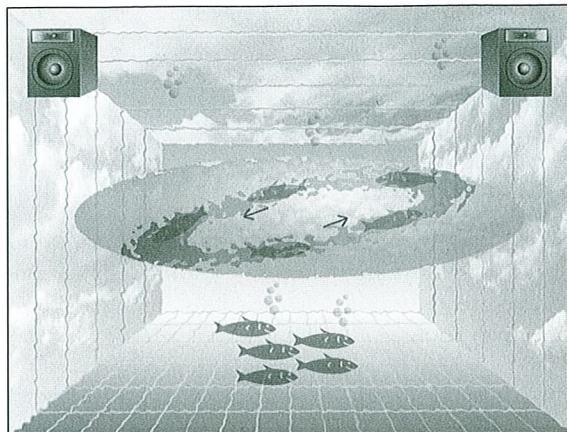
Visual 207. Spacious Reverb

Long delay times create a dreamy effect:



Visual 208. Dreamy Delay

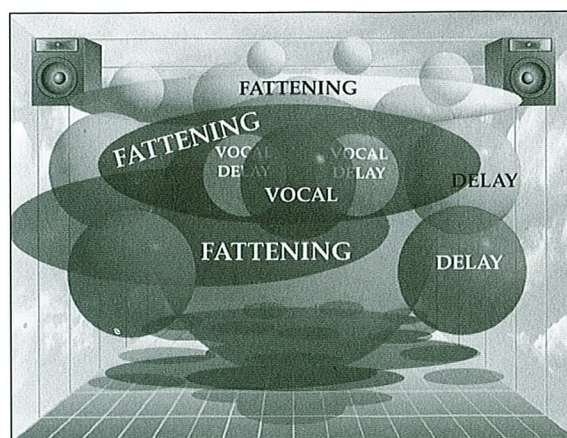
And flanging brings up a floating, underwater-type feeling.



Visual 209. Underwater Flanging

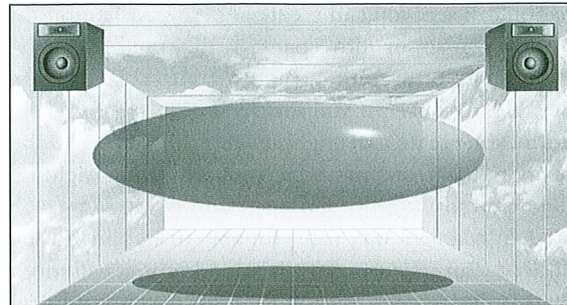
When you change the parameters of the effect, you also change the feeling that it creates ever so subtly. The trick to getting to know the intricacies of the feelings that different effects create is to simply play with them. As with any instrument, practice makes perfect. Get to know your tools. Get to know them so well that you can then create art with them.

Regardless of the type of feeling that an effect adds to a mix, time-based effects, such as delay, flanging, chorusing, phasing, and reverb, all add more sounds to the mix, filling out the space between the speakers. Therefore, they all add a dynamic of fullness to a mix. The question is whether more fullness is appropriate for the style of music or song.



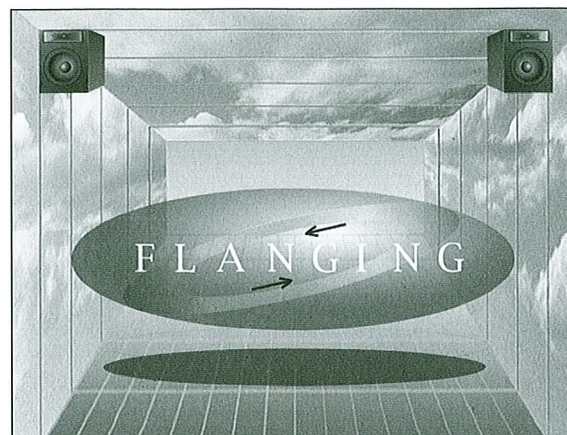
Visual 210. Mix With Lots of Different Delays Filling Out Mix (see color Visual 210C)

As previously covered, fattening stretches a sound between the speakers, filling out the mix.



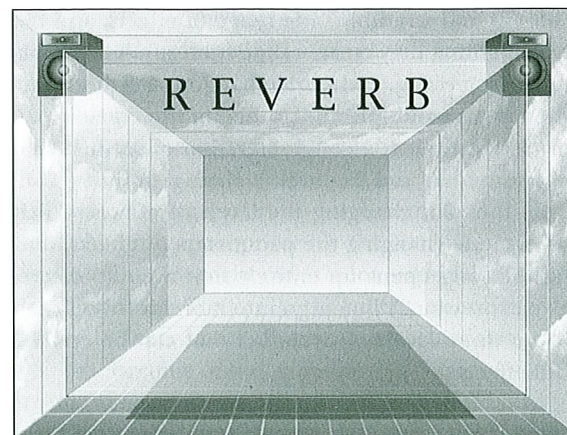
Visual 211. Fattening

Flanging, chorusing, and phasing are also based on short delay times, so they, too, will tend to make the mix sound bigger and fuller.



Visual 212. Flanging

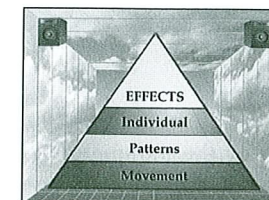
And, of course, reverb is really made up of hundreds of delays, so it takes up a lot of space in a mix and fills out the mix tremendously.



Visual 213. Reverb

All effects make a mix fuller, bigger, and badder (depending on your perspective). However, they also make a mix busier, so watch out.

Level 2 Dynamics: Patterns in Effects Placement



Time-based effects add extra sounds to the mix. When you add a delay, you now have two sounds. Add feedback and you could have ten sounds. Add reverb and you have added hundreds of sounds (delays). Therefore, when you add multiple effects, you can very easily and quickly fill out this limited space between the speakers.

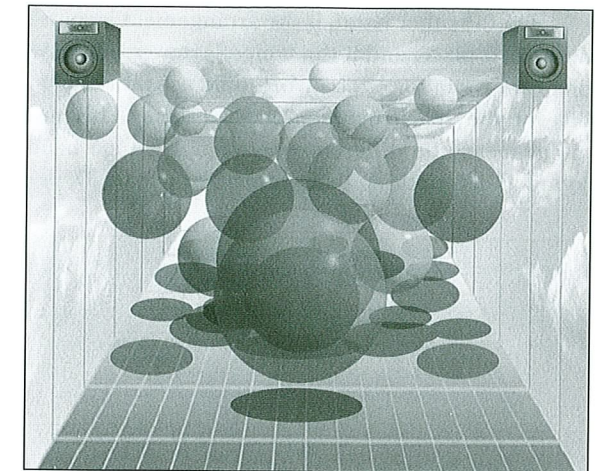
SPARSE MIXES

Sometimes you add very few effects to keep the mix clear and sparse, with plenty of space between each sound. For many styles of music, like folk, bluegrass, and many forms of jazz, it is required that there are virtually no effects to obscure the pure clarity of the natural sounds. Also, you shouldn't obscure the natural beauty of a pure song, if that is what you have. After all, it is the song that counts.

FULL MIXES

Sometimes it is appropriate to use effects to make a mix sound fuller and bigger, like a wall of sound. Many styles of music, such as new age, alternative rock, and heavy metal, often have a large number of effects to fill in all the spaces between the sounds, creating a full mix. In some songs, the entire song is about effects. This is often the case with rap, hip hop, techno, and space rock. In this case, it is fine to have a ton of effects.

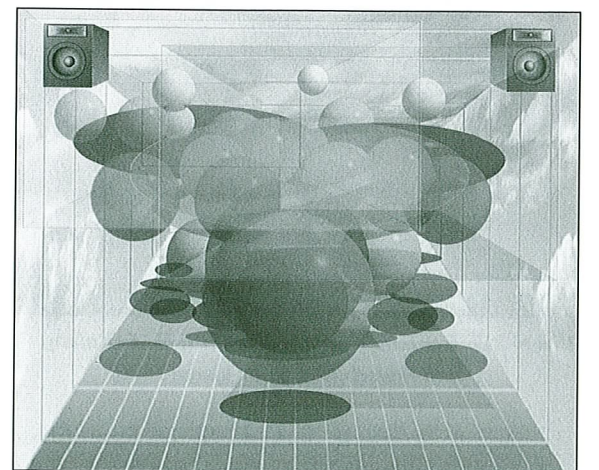
The main thing that makes a mix sparse or full is actually the number of sounds and notes in the song. Some songs have a busy arrangement in the first place; while others have a sparse arrangement. Therefore, when you approach a mix, one of the first steps is to check out the density of the arrangement. If there is a lot going on in the arrangement, you normally use fewer effects, simply because there is not enough room left between the speakers. This is commonly the case with salsa and symphonies where so much is already going on. The music of the Talking Heads is another good example of busy arrangements with clean mixes.



Visual 214. Extremely Busy Mix With No Effects (see color Visual 214C)

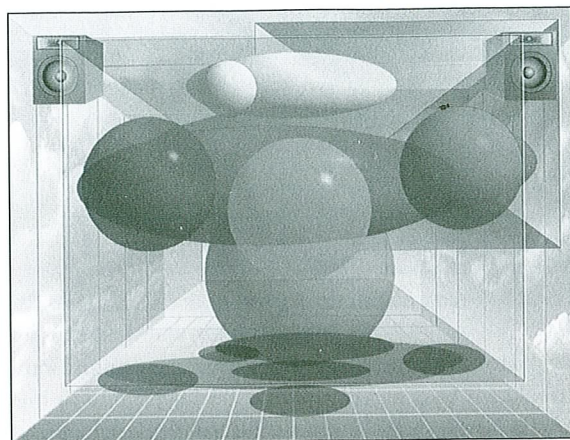
However, there are times when you might want to make a busy arrangement even bigger. Often bigger is better with new age, alternative rock, heavy metal, and other hard rock. The more powerful, the more awesome. Therefore, you might consider adding effects to such a mix even if things are already crowded. Forty-eight guitars may not seem so clean and clear, but it creates such a massive wall of sound that it can blow people's minds.

It was Phil Spector who was first known for creating this style of mix. In fact, he even did it in mono. For the longest time, everybody was addicted to clarity. Then Phil started adding more and more instruments to the mix and started using reverb to really fill out the space between the speakers. His mixes were dubbed "The Wall of Sound." These days we have taken this concept to the extreme. You might take a moment to think of the songs you know that have a busy arrangement with a full mix.



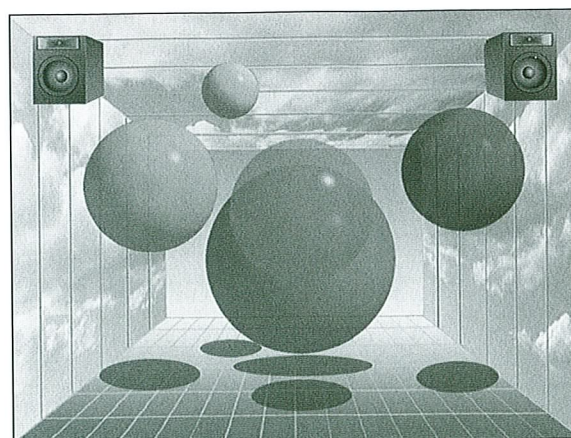
Visual 215. Extremely Busy Mix With Lots of Effects (see color Visual 215C)

On the other hand, if the arrangement is sparse in the first place, and if the tempo is slower, you have plenty of room for effects. You could use fattening to fill out the space between the speakers. This just might mean the difference between a garage band sound and something that sounds like a real CD.



Visual 216. Extremely Sparse Mix With Fattening and Reverb (see color Visual 216C)

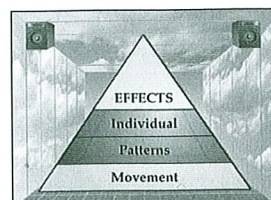
Occasionally, an extremely sparse arrangement is left that way. In this style of mix, every single sound is completely separate from every other sound in the mix. This makes each sound easily distinguishable from all the other sounds. As mentioned, bluegrass, acoustic jazz, and some folk music are commonly mixed this way. Steely Dan is a good example of this style of mixing: Very few effects are used to create as clean and clear of a mix as possible.



Visual 217. Extremely Sparse Mix With No Fattening and Reverb (see color Visual 217C)

A full or sparse mix might be appropriate depending on the type of person you are working with, the nature of the song, and of course, the style of music.

Level 3 Dynamics: Changing Effects (Types, Levels, and Parameters)



Changing the levels of effects or the parameters of effects during the mix is one of the most intense dynamics you can create. It is such a strong dynamic, it must certainly be appropriate in every way.

There are a number of ways that you can create movement with effects. You can turn up a delay on the end of a word, word, word or add reverb on the end of a solooooo. You could add flanging to a line in a song about "floating through life." Or take all the reverb off a particular line to make it more up front and personal.

Adding or taking away an effect, or just changing the level of an effect, is such a strong dynamic that it often becomes the sole focus of attention for the moment. Therefore, the effect should be done skillfully, so that it fits in with the song and the music. Some performers, like Frank Zappa, Mr. Bungle, and even Pink Floyd, have actually created songs based around changing effects.

You can simply turn the amount of effects in the mix up or down, but you can also change the type of effect or change the parameters within each effect. The capabilities of doing this are much simpler now with MIDI controllable effects. You could actually have the effects change based on the pitch of the note being played. Or you could use some sort of MIDI controller to play the effects like an instrument.

Of course, you can only create such overwhelming dynamics if the band will let you. You might keep a lookout for those bands that write songs with changing effects in mind. This is why rap, hip hop, and techno can be so much fun to mix.

Even if a song doesn't have completely different sections where you can use completely different effects, you can still create subtler variations between the sections of a song. You might add a little more reverb to the snare for the chorus section of the song, change the type of reverb on the snare for a lead break, or add fattening on the lead vocal during the chorus. Commonly the reverb on the snare is boosted ever so slightly at the end of a song when it gets rocking.

It is extremely cool to create subtle differences in various sections of a song, so when someone is listening closely they will hear more detail. When they listen over and over and over, they will always hear something new and will never get bored.

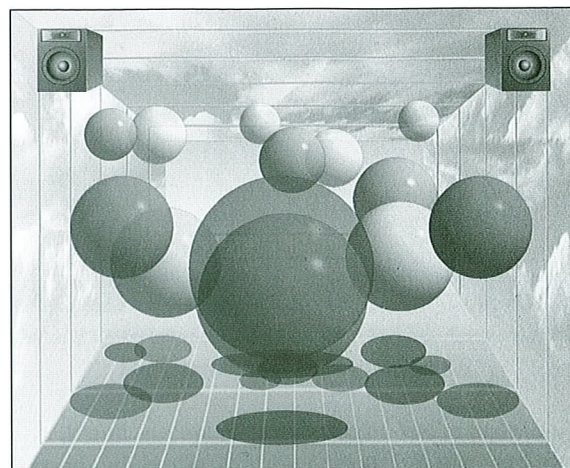
CHAPTER 6

Styles of Mixes

We have now covered the levels of dynamics that can be created with the four tools in the studio—volume, EQ, panning, and effects. You can stack effects, then use volume, panning, and EQ to place the effects in various places. But when you use the four tools together to create a certain style of mix, it's even more powerful. The most powerful effect is when the four tools together create a certain style of mix and then are changed to a different style of mix in a single moment.

USING COMBINATIONS OF MULTIPLE SETTINGS TO CREATE HIGH-LEVEL DYNAMICS

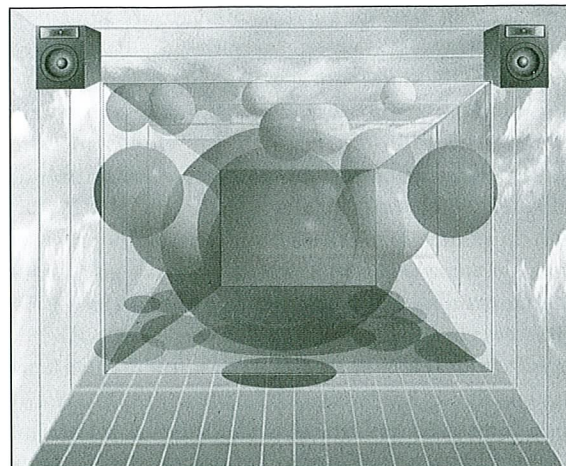
You can make an instrument more present and out front by using volume. Compression will make it more stable so that it seems even more present. If you brighten it a bit with EQ, it will be clearer, and keeping it clean with no effects makes it more present. Panning it to the center will also help. And if it's spread in stereo, it will really seem like it's your face. Using all of these techniques simultaneously will make the sound jump right out of the speakers.



Visual 218. Clean and Clear Mix (see color Visual 218C)

To make a sound come even further out front in a mix, start with a mix that has a good amount of reverb in it. Then, take the reverb off and the sound will seem to move forward. This can make a sound jump so far out front it seems like it could smack you in the face.

If you want to put a sound in the background, do just the opposite: turn it down, make it dull with EQ, pan it to one side, and add long delays and reverb.



Visual 219. Distant Mix

You can also send a sound out for delay, have it return on a channel of the console, send the delayed signal to the reverb, and then pan the reverb separately from the delay (both of which might be in a different place from the original dry sound). The volume of the delay compared to the reverb can be adjusted to make the nuances fit your taste. You could even EQ the delay differently from the reverb and from the original dry sound.

An especially effective trick is to turn up the feedback on the delay before it is sent out to the reverb, then take the delay out of the mix by unassigning the mix button (if you simply turn off the delay channel, it will also turn off the signal going to the reverb). What you end up with is reverb with a really long predelay and feedback. It is an extremely smooth effect that, when put on a vocal, makes it sound like you have a vocal synth in the background. Many guitarists, including David Gilmore, like it on their guitar as well.

Another interesting effect is to send the output of flanging, chorusing, or phasing to a reverb unit. This is often much nicer than simply putting these effects and reverb in the mix.

One of the most interesting combinations of effects is to send out for fattening (flanging, chorusing) on a sound, and then send the fattening to a 3D sound processor, surround sound, or multiple speakers. This way you can bring the fattening effect out in front of the speakers or even behind you.

A similar effect is to send reverb to the 3D sound processor, surround sound, or multiple speakers. You can make the reverb sound extremely spacey by putting it out in front of the console (right in front of your nose—but in stereo).

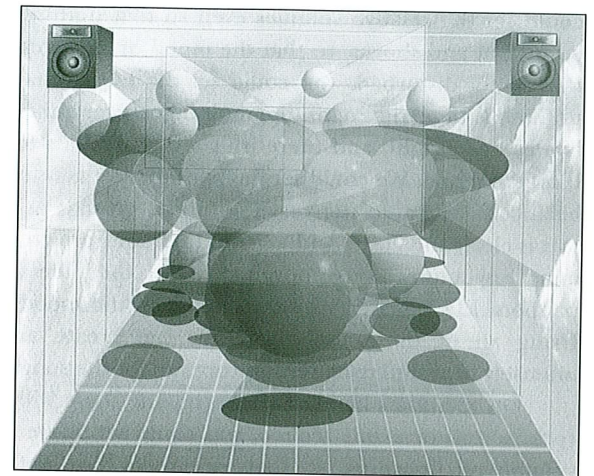
One of the most exhilarating effects is to put a delay with lots of feedback in the 3D sound processor and use the joystick to rotate it around the room (what a business we're in, huh?).

There are certainly a huge number of really cool combinations of effects. See if you can come up with some new ones on your own. If you come across anything that is death-defying—or just really nice—let me know (e-mail: virtmixr@hooked.net) and maybe I'll put it in the next version of the book.

CREATING A CONTEXT OR STYLE OF MIX

By using all of the tools together to create combinations of dynamics, you can create all the different styles of mixes in the world. One style of mix is the wall of sound. Just using multiple effects will fill in the space between the speakers quite well; spreading sounds in stereo with delays or adding reverb will quickly fill in every hole in the mix. But, when you also boost the low end a little on each of the sounds, they will all take up more space. You can also use panning to spread sounds in stereo if the two sounds are similar (like when you have two mics on a guitar amp); then, when you pan the two sounds completely left and right, they will pull together so that the sound is stretched between the speakers—making the mix much fuller. Panning sounds so that they overlap a bit makes a stronger wall of sound. If you have very few sounds in the mix, making the volumes more

even will contribute to a fuller mix. On the other hand, if you have a really busy arrangement, uneven volume placement will actually take up more space, creating a fuller mix.

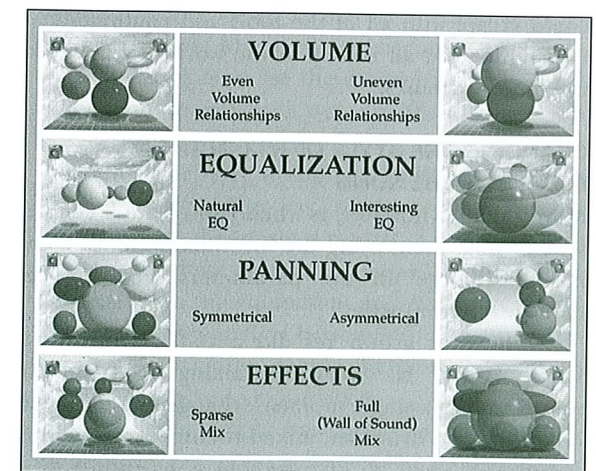


Visual 220. Making Mix Fuller

Because the main thing that makes a mix full in the first place is the number of sounds and notes in the song, you can help make the mix fuller by having the band play more parts. For example, you might have the band doubletrack or play the same part three times. Multiple mics on one sound can also add to the density of the mix.

As you can see, using all of these techniques together can build a huge mix. On the other hand, if you want a mix to be sparser, cleaner, and clearer, do the opposite: fewer sounds, fewer effects, brighter EQ, wider panning, and appropriate volume settings.

With these four tools we can create the following dynamic patterns. These are some of the emotions and feelings that we can create with the technical equipment in the studio.



Visual 221. Dynamic Ranges Using 4 Mixing Tools

By changing any of these tools in real time, we can create additional movement and much more intense dynamics. And we can use all four tools to create an incredibly powerful dynamic.

For example, if you're mixing a love song, you could set the relative volumes even so that nothing jumps out and shocks, so that the mood of the emotion is not disturbed. You could set the EQ so that nothing is too irritating in the midranges, everything is nice and bright, and there isn't too much bass to blow the mood. We could set the panning so that it is balanced. We could use very few effects, so that the mix is clean and clear. And we could refrain from creating any unnecessary movement with the faders, panpots, EQ, or effects so as to not spoil the mood. Using all of these tools together can create an intensely beautiful dynamic appropriate for the song.

On the other hand, if you're mixing some wild rock 'n' roll or exotic techno, you could set uneven volume relationships, so that we would have soft sounds followed by loud sounds, creating a very exciting dynamic. ROCK 'N' ROLL!!! You could set EQ to get lots of highs and lows. And you could EQ some sounds so that they cut through and are edgy in the midrange, making the whole mix jump out and grab your attention, forcing you to dance. You could set the panning to be unbalanced, creating tension and making the mix unusual. You could also add several different effects, making the mix interesting at every single moment.

Let's have some serious fun. Enough of the status quo. We could have things zooming left and right with panning, volumes going up and down, EQ changing throughout the mix, and effects and their parameters going up and down, as well as their parameters changing constantly. Using all of these tools together, we can create an intensely beautiful dynamic totally appropriate for the song.

These are two extreme types of mixes that we could create with all of the tools and equipment in the studio, and all mixers in the world fall between these two extremes.

CHANGING THE STYLE OF MIX IN THE MIDDLE OF THE SONG

More intense, however, is when you create a certain style of mix, then, using the four mixing tools, completely change all the parameters, creating an entirely different style.

The rock group Yes did it with "Owner of a Lonely Heart." They play a screaming electric guitar sound and, in a single moment, change to a '50s style recording of a drum set, miked twenty feet away with a dull EQ. Then all of a sudden, they return to a screaming guitar/synthesizer type of sound that is

extremely edgy. Sudden changes in multiple mix parameters can be extremely effective.

Sting also did it with the song "Englishman in New York." The song goes from a jazzy groove—very few effects, very clean, small snare sound—to a huge drum sound with tons of reverb instantly. Then, in a flash, it is back to the simple, clear jazz mix.

Of course, you can only create such dramatic mix dynamics if they are appropriate for the song. This was obviously one of Frank Zappa's favorite techniques, and Mr. Bungle has taken this concept to the extreme; every 30 seconds, the song and the mix change completely.

To change the entire mix in a single moment can be shocking. It can blow people's minds. It can show people that their reality is just an illusion that can change at any moment. But best of all, it shows perspective. It shows people that they don't need to stay stuck in their current reality. They only need to put a different mix on the situation.

All the mixes in the world are created with just these four tools: volume, EQ, panning and effects. It's what *you* do with them that counts.

CHAPTER 7

The Relationship of Musical Dynamics Created by Equipment to the Musical Dynamics Found in Music and Songs

Now that we have discussed all the dynamics that can be created with the technical equipment in the studio, let's return to the basic concept: *The art of mixing is the way in which the dynamics we create with the equipment in the studio interface with the dynamics apparent in music and songs.* You can now begin to explore all the different relationships between mixing dynamics and the dynamics that people perceive in music. The trick is to remember what you did when you find something that you really liked in a mix.

Remember what you do—especially when what you do creates magic! After a couple of years of keeping track of the magic, you become a magician.

Putting It All in Perspective

Now you know what is required of a recording engineer. Besides learning the technical side of the equipment and how to work well with a wide range of strange, unusual, and wonderful people, a recording engineer also deals with refining a diverse array of aspects—even the music itself. The mix is only one of many aspects that contributes to a great recorded piece of music.

You've learned many of the details of the dynamics that can be created with studio equipment. You now have a mixing framework, designed to include all of the musical possibilities, to help you get a good perspective on all that you can do in the studio.

Just as a great musician must, at some point, learn

and incorporate aspects of theory and technique into his or her actual playing, so must the aspiring recording engineer incorporate theory into practice. This process varies for different people. Some people are fanatics (driven by parents, childhood experiences, or from something above), will take the bull by the horns and study until they are blue in the face, and have it all down. Others will incorporate the aspects that stick out in their minds the most. One or more ideas will sneak into your recording projects over the next few months. You might also reread some sections of this book from time to time and gather a few more tidbits to incorporate. Regardless of your style of learning and how you incorporate this learning into practice, you now have an overall structure to see all that an engineer does, and you can focus on what it takes to become great at it.

The trick is to use the dynamics created by the equipment to enhance, accentuate, highlight, support, create tension or just let the music itself shine through (whichever is appropriate for the song and style of music). The way in which these dynamics interface with the music is the art of mixing. The art of the recording engineer is to seek out the relationships between the equipment and the music that are the best—whether they be magical, beautiful, amazing, world-changing, people-changing, or just cool. *Don't stop until you get goosebumps.*

Different people have different ideas of what great art is. The point is to develop your own values about what you think is great art. **Then, make it!**

About the Author

David Gibson has been teaching, engineering, and producing groups in major 24-track studios since 1982 and is the founder and owner of California Recording Institute in San Francisco. Before that, he taught recording at Cabrillo College in Santa Cruz for five years. He has been using the concepts and visuals presented in this book in his classes since 1986.

Previously, Gibson owned a commercial music production company called Creative Music Services in Atlanta, Georgia. He has recorded many jingles for the Santa Cruz Boardwalk.

David has also done recording for James Brown's band, Bobby Whitlock (Derek and the Dominoes), the Atlanta Rhythm Section, and Hank Williams Jr.'s band, as well as having worked with members of the Doobie Brothers, Lacy J. Dalton's band, Herbie Hancock's band, and It's a Beautiful Day.

Gibson co-produced a double album with Jonathon Segel of Camper Van Beethoven and has produced a variety of other albums ranging from new age to heavy metal to hip hop and techno music.

Gibson is also the inventor of the patented "Virtual Mixer," which displays a mix visually in real time. He created a customized version on the Silicon Graphics computer that shows the visuals in 3D with 3D glasses.



Appendix A

Dynamics Created by Studio Equipment Categorized by Emotional Effect

The key is to establish a connection between the technical equipment in the studio and the feelings and emotions found in music. The following chart will help you understand this concept. The middle column shows the tools. Columns two and four show the types of dynamics that can be created with the tools. And columns one and five show the types of feelings and emotions created by the dynamics.

Mellow Emotions ordered structured even fun gothic stable normal romantic balanced simple	Even volume relationships with little variation between each sound and successive sounds from song beginning to end	Volume	Volume relationships that vary drastically between sounds and from section to section	Intense Emotions interesting exciting wild creative crazy new fun unbalanced complex
	Natural EQ between all instruments; they all fit well together and are "natural," as if you were there	Equalization	Interesting EQ between instruments calls attention to particular ones because they sound noticeable "different," unnatural, or unique	
	Balanced, symmetrical placement	Panning	Unbalanced, asymmetrical placement	
Positive Values warmth peace love security atmosphere centeredness	Dry, clearly EQ'd, unaffected instruments, placed in positions in the mix to be separate from each other, leaving "space" between the sounds	Effects	Wet, bassy, and "full" EQ; fattened, thickened, and delayed sounds, placed overlapping positions in the mix, leaving no "space" unfilled between the speakers	Positive Values fun creativity catharsis intrigue perspective apparent
	Use of compression makes the image of the sound more stable because it moves less	Stabilization vs. Movement	Panning, changing volumes, adding or changing EQ, and changing effects make the sounds less stable	Negative Values frenetic crazy annoying psychotic abnormal

Appendix B

THE MIXING PROCESS

Different engineers have their own procedures to follow when developing a mix. What follows is a process that will help you build the mix most efficiently.

1. Equalize Each Instrument Individually

You need to make each individual sound good; this means making the sound either natural or interesting. If you have heard the entire song, you can also EQ the sound so it will sound good in the mix. Don't spend too much time working on a sound by itself—what the sound is like with the other instruments is what counts. Just get it in the ballpark, and if it ain't broke, don't fix it. Also, when in solo, always EQ it brighter than you think it should be. High frequencies are easily masked by the other sounds in the mix.

2. Bring Up the Mix

a) Bring Up Fader/Volume

The order and manner in which you bring up and balance out the levels of all the different instruments is important. It is helpful to establish and stick to a specific order. Here is the outline of a commonly followed order:

Drums: kick drum, snare drum, hi-hat, overheads, toms
Bass Guitar
Basic Rhythm Instruments: rhythm guitar, keyboard rhythms
Lead Vocals
Lead Instruments
Background and Harmony Vocals
Percussion

It is a good idea to build the foundation, or rhythm parts, of the mix first. Some engineers will bring up the vocals after bringing up the kick drum.

b) Pan to Taste

Pan each sound as you bring it up.

c) Add Effects

Many engineers will add effects as they bring up the instrument in the mix. However, you can't set the final level of the effects in solo because effects get masked by other sounds in the mix. Therefore, you

must always set the final level of effects while in the mix, with all sounds up.

3. Refine Equalization, Volumes, Effects

Then, do it again and again and again . . . until you're satisfied or almost out of time.

4. Plan Out and Practice Moves to be Done During Mix

There are four types of moves that can be done during a mix: panning changes, volume changes, effects changes (volume and type), and equalization changes. If there are too many moves to remember easily, map them out on paper. Practice your moves before recording onto the mixdown tape.

MIX MAP

You use a mix map to facilitate remembering multiple moves (such as volume, panning, EQ, and effects changes) during the mix and performing them precisely, as well as to preserve all your settings and moves should you need to mix the song again.

You begin by mapping out the song structure (verse, chorus, bridge, lead, break) with times. The Reset column is to remind you to reset all of your settings for the beginning of the song whenever you play the mix again.

Notice here that the kick, snare, and bass are brought up to level 2 during the Lead Break and then to level 3 during the Vamp (repeating Chorus at the end). These precise levels are marked on a piece of masking tape next to the fader or with a grease pen. The snare has reverb turned up on the Bridge and then turned down on the Lead Break. The overheads are boosted for the Intro of the song, then brought down at the beginning of the First Verse. The keyboard is panned to the left at the Bridge, then returned to left and center spread at the Lead Break. The rhythm guitar is panned to the right at the Bridge, then returned to a right and center stereo spread at the Lead Break. The guitar fills are swept from left to right during the Lead Break. The lead guitar is panned more toward the center and brought up to level 2 during the Lead Break. The vocals are brought up for the first verse, taken down for the

Trk	Inst	Reset	Time	00:00	00:42	1:20	2:15	2:35	3:10	3:55	4:20	4:44
				Intro	Verse 1	Chorus 1	Verse 2	Chorus 2	Bridge	Lead	Vamp	End
1	Kick									2	3	
2	Hi-Hat											
3	Snare	1							RvbUp	2	3	
		Rvb								RvbDn		
4	OHL	1			2							
5	OHR	1			2							
6	Toms											
7	Bass	1								2	3	
8	Keys								L	LC		
9	Rhy Gtr								R	RC		
10	Gtr Fills	Pan								Pan		
11	Lead Gtr	1								2		
		L/R								Ctr		
12	Vocals	1			2	3	2	3	Rvb		4	
											RvbOff	
13	Horns	DlyDn								Dly		
14	Perc	EQ								EQ		

Mix Map Chart

Choruses, and brought to level 4 for the Vamp; reverb is added for the Bridge, then taken off for the Vamp. The horns have a delay that is added in the Lead Break, and the percussion has an EQ effect that is done in the lead break.

Once you have completed the map, place it where you can follow it throughout the mix. This enables you to do an incredible amount of moves very precisely and shows you where you have a lot of moves to make at once, which might require some practice or some help from a band member. When you do an automated mix, this information is stored in the computer.

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THE ART OF MIXING

A Visual Guide to Recording,
Engineering, and Production

by *David Gibson*

David Gibson's unique approach to mixing gives you a visual representation of the dynamics of the sounds involved in creating a musical mix. In explaining the aesthetic side of what makes a great mix, he introduces a framework that will help you understand everything that an engineer does. Once you know what *can* be done, you have the power to be truly creative all on your own: to make art out of technology.

Gibson's book presents:

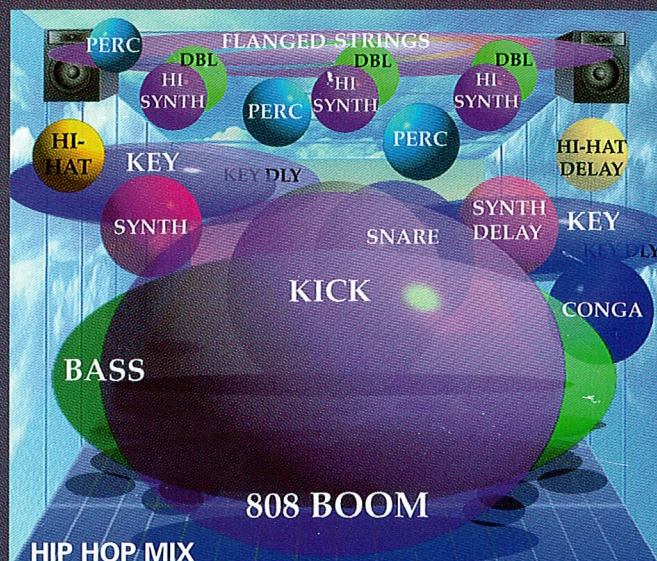
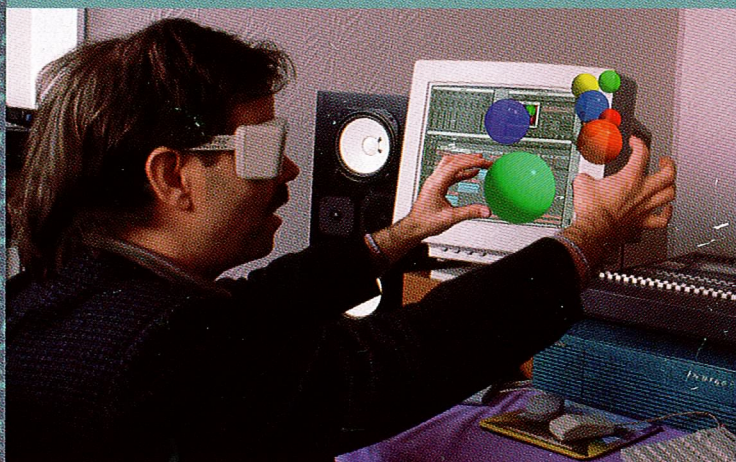
- an overview of all the aspects of a recorded piece of music, with the mix as one component
- the human dynamics that go into balancing the values of everyone involved in the recording and the mix
- descriptions and visuals of the functions of each piece of studio equipment involved in mixing
- the relationship between the natural dynamics apparent in music and the dynamics you can create with the equipment in the studio

This expansive book uses the sounds between the speakers to explain *and show* how to mix every style of music in the world, from big band to hip hop. Gibson has mapped out everything that can be done to create various effects in a mix. It's an in-depth exploration into the aesthetics of what makes a great mix in a simple, visual manner.

Technical edit by George Petersen, editor *Mix* magazine.

"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 sample editing tools—and this book is a great place to start."

—Thomas "Dolby" Robertson



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