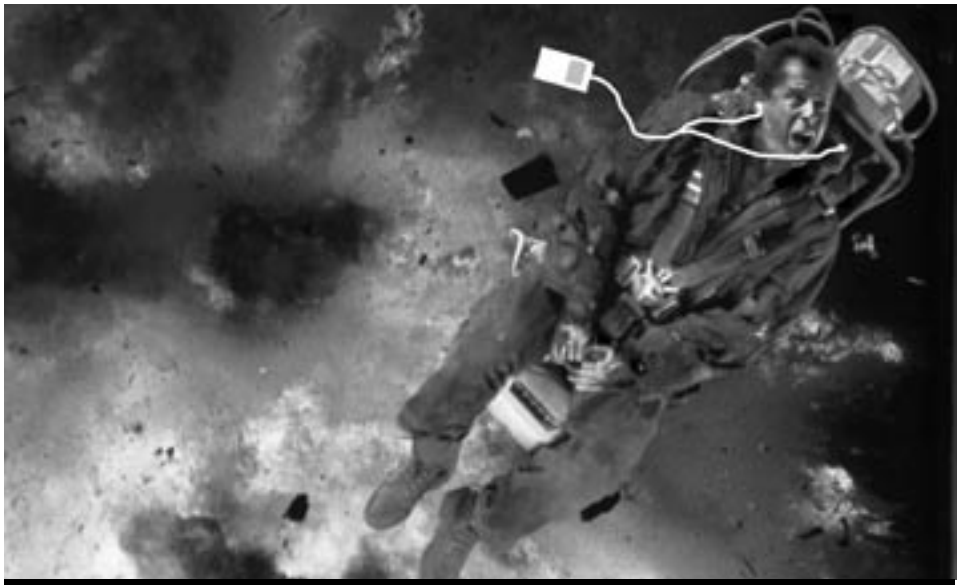
To Remaster or Not to Remaster?

Or, Why Is My Collection So Much Louder These Days?

By Ian D. Thomas

We always hear about older CDs that are being newly remastered and it's not uncommon for people to think that this mysterious process must improve the original. In fact, record-label marketing departments bet on that impression. But what is mastering, anyway? And what exactly does the process do to the music? Does mastering always make the sound better, or could it actually be damaging precious recordings? So many questions...let's see if we can clear things up a bit.



WOW, THAT'S LOUD: Fingersnaps and bomb blasts are all the same thanks to compression technology.

Heed Thy Master

Mastering is the final creative step in the recording chain before manufacturing. In the old days, the mastering engineer was the guy who cut the master from which all the LPs were stamped. Today, mastering engineers work largely in the digital domain. Their job is to assure that the musical efforts of the artist make it into the final product. It sounds simple enough, but it takes an experienced engineer with the right equipment, and a well-trained ear, to make it work properly.

There are four key steps to mastering. First is the sequencing of the album along with the conversion from an analog format (if the album was recorded on magnetic tape) to the digital domain. Next are two steps that can be considered "sweetening," the application of equalization, as well as control over the dynamic range of the recording. Finally, there is the issue of noise reduction, which is obviously more important for older recordings.

Ideally, the mastering engineer would do absolutely nothing. If the original recording sounds perfect, then the only thing to do is put the tracks in the right order and you're finished. But this is very rarely the case, as most recordings can be improved with some additional processing.

Master of Its Domain

It's important to note that digital audio has come quite a way since the early '80s and the introduction of the CD. Analog to digital converters have steadily increased in accuracy and can add quite a bit to the overall sound quality of transfers from older magnetic tape recordings. Simply running the tape through modern converters can enhance the quality of an older recording, making a solid argument for remastering. But there are other issues to consider.

The engineer may apply some type of equalization, also known as EQ, to the individual tracks. This can tame resonances or other rough edges in the recording, but can also be used to bolster the bass if needed, or make a vocal sound less murky. Think of the two tone controls on your stereo. The mastering engineer has a much much larger number of knobs that can be adjusted to bring out the best (or hide the worst) in the music. EQ is a powerful tool and, like most powerful tools, can be highly destructive in the wrong hands.

A short course on mastering, remastering and knowing when to say when.

Noise reduction is fairly easy to grasp. Tape hiss or other noises from the production can usually be dealt with by the mastering engineer and removed from the final product. Once again, noise reduction has to be carefully applied, or it will take some music out along with the noise!

Dynamic Dynamite

Dynamic alteration, in the form of compression, is one of the most heated topics amongst mastering engineers today and is changing the way we listen to music.

Try this: Rub two of your fingers together. Hear that quiet rubbing sound? Great.

Now, go outside and blow up your car. Hear that? Pretty loud.

This is the basic problem facing any recording engineer. Nature has an alarmingly wide range of volumes that somehow need to be captured and played back on equipment with a much smaller range. The answer to this problem is compression.

Compression has been around a very long time and is used, in some way, on just about every recording. Its original purpose was to allow a wider dynamic range to be recorded into a smaller space. When done properly, it sounds completely natural, with all of the musician's intent left intact.

But then along came rock 'n' roll. Soon, those wacky engineers were twisting the knobs in all sorts of directions and changing the sounds in interesting ways. It's never been quite the same since. Compression is still used to control dynamics, but is also used today in most rock/pop/rap as a special effect. The problem begins when the two techniques start to blur.

Note: Compression is usually used on individual instruments (drums, bass, vocals, etc.) during recording or mixing. But at the mastering stage, any use of compression will affect the whole mix.

The Loudness Wars

Beginning in the 1990s, mastering engineers began to get requests to make albums louder. Each artist wanted his album to be louder than the other guy's album. Since the digital audio format has an absolute volume ceiling, above which you cannot get any louder, how do you make it *sound* louder? The answer is to heavily compress the whole song. Make the softer parts as loud as the loudest parts and the whole song will sound much louder. The downside to this techniques is that the dynamic nuances of the performance are lost for good. That might be fine for the Red Hot Chili Peppers, but what about film scores and classical music? Getting back to our comparison, imagine if the sound of your fingers rubbing together were as loud as the sound of your car being destroyed. The idea doesn't sound very pleasant, does it?

FIGURE 1: Pop music, today and yesterday.

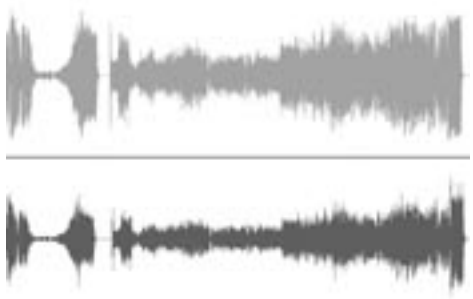


FIGURE 2: A remastered soundtrack (top) and the original.

Figure 1 shows two up-tempo recordings from the same popular artist. The upper waveform is from a song recorded in the mid '90s. The lower waveform is from 1981. Notice the difference? The overall volume of the newer song, represented by the vertical axis, is almost constant. The blocky look of the waveform indicates a recording that has been severely compressed–this is one loud CD! Note that the lower waveform has a little variation to it. Overall, it is quieter, but there is also more movement to the dynamics. The race to be the loudest has left the rock/pop/rap trenches and is marching on toward classical and soundtrack albums.

Figure 2 shows a remastered film soundtrack with the original release below it. The remastered version is definitely louder, but notice the final crescendo. On the original recording, the orchestra slowly builds and adds a dramatic exclamation point at the end. On the remastered version, the dynamics have changed, with the orchestra getting louder sooner, and maintaining that volume throughout the ending. Remember, they are both from the same original recording, yet they will sound totally different. Which would you rather hear? Another downside to over-compression is that raising the level of the quieter parts will also increase any noise like tape hiss, air conditioning, etc.

Sadly, even films are bowing to the pressure, as directors keep insisting that their movies be louder than the last major blockbuster. Explosions in films used to go "tick...tick...BOOM!"; now most go "TICK...TICK...BOOM!" And if that's not bad enough, even some modern orchestras are adding hidden PA systems to their concert halls so that the musicians can be heard at higher volumes. It's already a loud world out there; do we really need it any louder?

Most mastering engineers are proud of their profession and are opposed to squashing the dynamics from their recordings and cranking the volume. But ultimately, it's the customer's choice. There is a historical perspective to consider: The original tapes of many famous recordings are disintegrating, and mastering these recordings one last time can save them for future generations, but not if we alter them drastically. Unfortunately, once a recording is overcompressed, there's no way to undo the damage. And if the master tape is gone, then all you have left is a shadow of the original.

So, next time you buy a re-release of a favorite album that's been remastered, hang onto the old version and compare them before you toss the original one into the trash. It may actually be the better sounding of the two! **FSM**

Composers of the Roundtable

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that aren't investigated—in this case they can't be investigated because the film is about this one man and he's in every scene, and he's unable to investigate his own feelings, so it fell to me to do that in a way. The music through pretty much the entire first reel of the film is an eight- or nine-minute cue that goes through the opening titles, this montage where you're introduced to his interviewing technique, he talks about his childhood, and that takes you right up to when he starts teaching in adulthood, and that was challenging—it's very long, but it was an opportunity to introduce most of the themes in the score and test whether they were working."

Kinsey is set in the 1940s and '50s, but Burwell felt under no pressure to make his score adhere to period stylings. "The music doesn't attempt to tell the passage of time, which is told mostly through some pieces of pop music and costume and makeup; it is mostly a unifying factor. One of the things music does at the opening of the picture is establish a theme for Kinsey's relationship with nature—he's a boy outside by himself observing animals, and there are several outdoor scenes in that first reel in which this theme is established—it's played by French horns in parallel fifths, and it occasionally comes back in—it comes back in in a montage in the middle where he's doing interviews all over the country. It's an attempt to say that his interest in humans and human sexuality is just one aspect of his interest in nature—that from his perspective it's not any different interviewing humans than it is watching chipmunks with a telescope, and that theme comes in at the end when he's really at death's door and near the end of his life, and a simple walk through the woods is able to bring him back to the source of his inspiration, which is nature. It appears at important times to suggest this fundamental motivation for his work." ■