



Why Mastering

Adding The Finishing Touches That Will Make Your Music Sizzle

by Kraig Greff

Before your recorded music is duplicated or broadcast, it must go through a process involving three major steps. Mastering is the third link in this chain and is easily the most misunderstood. Also, much of the success of the mastering process depends on what has been done to the music before it reaches the mastering engineer. The purpose of this article is to shed some light on the black box of mastering and to highlight important considerations in the first two steps that can impact the success of the mastering process.

Even if you are working on a tight budget and are trying to do most of the work yourself, try to separate the three steps of the process as much as possible. It's amazing how many truly laughable recordings are circulating that are the product of a band who decide to be the players, the engineers, the producers and the mastering engineers. These jobs have separate titles for good reason: each requires specialized knowledge and individual discipline. You'll never see the brilliant cellist Yo Yo Ma stop performing to help with the recording duties on the console or choose a different microphone. No, he plays the cello ... as well as anyone.

Step 1 – Recording

The first step in the process is the actual recording of the material to some format. This is where instruments and vocals are recorded to a multiple-track format. To end up with the best final product, it is important to remember to get a good level (signal to tape), but don't make the mistake of over-saturation. If you are recording to a digital format, zero (0) on your meter is absolute. If you hit it or go over, you will hear nothing more than loud crackles and the recording will be useless. The optimal level is somewhere between -18 dB and -12 dB. Don't push it too much. Remember that we are dealing with digital photographs here, so give yourself some headroom and don't destroy that dynamic range. This is not analog, so a contest to see who can get the closest to zero when recording can only lead to problems later.

If you're on a very tight budget and are working from a home or project studio, at least separate the tasks at your project level. Let's say you're playing the tracks, half live and the other half a mixture of samples and MIDI. Have at least a friend (who hopefully is a part-time engineer) turn the recorder on and off as you track the songs. You'll be pleasantly surprised by how much more you can concentrate on your performance when you're not flipping buttons.

Step 2 – Mixing

Once you have all of your material on recorded separate tracks, you've finished the first of the three steps toward a finished product and are ready to move to step two: mixing. This is where you or the engineer combine all of the recorded tracks into either a two-track (stereo) format and/or decide to also mix to a Surround format (5.1 or 7.1). At this stage, levels are adjusted, equalization and outboard processing (i.e., reverb, delay) are applied, and instruments and vocals are placed in the mix (i.e., panning left or right). The musicians and engineers ponder for hours, if not days, per tune until a final mix is achieved.

The principle of separating tasks applies to mixing a budget project, as well as recording it. Either ask a friend to listen to your mix and make suggestions, or talk to a professional engineer and have him/her come over and take a quick listen. Ask them for help to improve your mix. (This is where you follow their help with a tip of no less than \$100. You might want their help more than once. Don't embarrass yourself—these people are professionals.)

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A common mistake in the mixing process is making the final levels too hot. Final levels optimally should be between -18 dB and -12 dB. These levels are usually suggested by the engineers who designed and built the machine you are using. Many people who are mixing digital material believe they can go a little hotter. This often works, but remember: this is not analog and you are not saturating tape. You are recording numbers. Don't worry so much about using all of your bits or getting the highest bit rate from your machine. A recording that arrives at the mastering engineer's door with super-hot levels has no dynamic range (one of the key elements in a great recording) left. There is little or nothing a good ME worth his/her salt can do with this "hammered" material, and there is a good chance the job will be refused. So keep your hands off the compressor and especially the finalizer.

Step 3 – Mastering

The mix is finally done. Everyone is happy and exhausted. Parts have been played or tweaked over and over. Tunes have been listened to time and time again, adjusted and readjusted, levels up and down, knobs on processing gear worn down. The same material has been listened to over and over and over At this point your ears, if not your entire person, are worn out and your bank account is empty.

Don't make the BIG mistake and stop here. You have one more step left: mastering. Now, more than ever, the project needs an impartial set of ears. The mastering engineer has not been a part of the recording and mixing process. He therefore comes to the project with a fresh outlook, an open mind, and a set of ears that have not been fatigued by the strenuous and repetitive processes of recording and mixing.

You want the CD to be your completed vision, not just OK. You've just spent countless hours either at home or in the recording studio, and of course money, either in the studio or on expensive equipment, to play and record. To NOT master would be like running a marathon and stopping a foot before the finish line. Mastering can add many finishing touches to your hard work to make it truly a source of pride.

Even if you are on a tight budget, do not master your material yourself. Find a fresh set of ears. Remember where you want your music to be heard and by whom. Go for the best you can—you might only get one chance.

How to Find a Mastering Engineer and How to Talk to Them

First, some practical business advice, especially for first-timers. Please don't just send your material and your money to a business that advertises mastering at a super-cheap rate. Remember the old adage: If it seems too good to be true, it probably is! Remember that it's YOUR money. Mastering, above all, is not factory assembly work where a product is churned out like a case of potato chips. It is a listening art form that requires years of experience and technical knowledge. Don't fall for a company that just spits out your music in five days. You'll want to talk to your ME about your music. If they won't start a relationship with you and your music, move on!

So, how do you present your source material (final mix) to the ME and what happens now? First, think through the topics below in advance. If you are not sure, say so—the ME can give you helpful direction. When you are ready, it is important that you talk to the ME himself—not the secretary, not the answering service, and not the assistant.

The first thing the ME will need to understand is your overall sound. Whether a solo artist or band, you have a sound that is your image or fingerprint. Is it big and thunderous like Led Zeppelin, or tight and exacting like Steely Dan? Try to be as specific as possible. Rock and roll is not supposed to sound like a jazz CD. Define your overall sound and make sure the ME is comfortable with it. They should have experience and enjoy working with your type of music.

You will also want to describe your or your band's thoughts and creative vision for your project and the results you hope to obtain. Do you want a live feel or a very clean-sounding recording? Do you want recordings to fade or cut abruptly? Are there changes you would like to see in the overall sound?

Don't order the ME to compress your material right to zero so that it's "hot." A radio station will do that, and with multiple compressing you run the risk of hitting the brick wall with your material. Don't equate loud with big. This is maybe an old concept, but if the listening audience likes your tune, they can grab the knob and crank the volume. (And if they don't like it, they can probably find the "off" switch as well.)

Take the time with the ME to outline a plan of attack for the final destination where this music is to be played (i.e., radio, television, film). A project will often be mastered differently for different destinations.

This leads to one of the most overlooked benefits of the ME. Take advantage of the ME as a helpful producer. Chances are he has either mixed or mastered thousands

of tracks and/or CDs. If this is your first or second recording project, take advantage of this knowledge. Although the ME is NOT the mixing engineer, he should be open to musical questions about how your project should sound when completed (i.e., what should punch the hardest, the smooth transition from a rocker to a ballad, etc.).

Finally, you'll want to discuss timing and the ability to make revisions, if needed. It might be advantageous for you to have the ME send a small bit of completed work over a computer file just to make sure everything is going smoothly.

When you are ready to start work, you can send the material to the ME in a variety of formats, but for simplicity we'll only discuss a few. The easiest is to just send a CD of the newly mixed recording—usually a 16-bit CD is fine, although you should be able to send 24-bit. A DAT will also work. Your material can also be sent as uncompressed AIFF or WAVE files right from your computer software. Mastering for Surround is complex. Plan to spend extra time and money if this is your goal.

What The Mastering Engineer Can Do For Your Recording

Song order is very important. The ME can offer advice to place your songs in a particular order to comply with your vision. Song order defines the mood and the pace of the CD. Additionally, if you're sending your CD to a record company, they're probably not going to listen to everything. The opening song has to grab their attention.

The ME will edit and time your selections and can clean up intros and endings with the use of digital equipment. For a "live" feel, you may want to hear the studio count-off. Alternatively, you may want the song to start clean. The same holds true with the endings. The ME can generate a fade of a specific length or cut the tune abruptly.

The ME's biggest contribution will come from the addition of high-end processing gear to achieve the results you've discussed previously. Processing typically includes reference standard digital to analog and analog to digital conversion, proper digital clock timing and removal of digital jitter, high-end reverb and delays, stereo mastering tube compressor, proper level adjustment, stereo field management, and parametric and graphic equalization. Although the gear itself is critical and expensive, it is not enough. The most important part is the ME's ears and the application of years of experience and technical knowledge.

Many people are surprised to learn that analog gear is often used in the mastering process. Keeping the material 100 percent digital is not always the best answer, and computer plug-ins just don't approach the sonic quality of, for example, a great stereo tube compressor. Remember that it's sound quality we're achieving here, not fancy computer jargon. Trust your ME on this. A good ME is going to want to preserve the integrity of the source material.

I hope some of this information on the third step of the recording process helps not only those of you putting out your first CD, but also sheds some new light and concepts to seasoned artists. If you are just putting your budget together for your next CD or want to improve an existing one, include the all-important third step of mastering. I'm sure you'll be more than satisfied with the results.

Kraig Greff is a master award-winning musician, composer/arranger and engineer. For information on Kraig's services and for a no obligation consultation contact Kraig at 1-800-729-3905 or visit his website at www.tonalvision.com

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